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THE
ARCHITECT

AND

Contract Reporter.

A WEEKLY

ILLUSTRATED JOURNAL

OF

ART,

CIVIL ENGINEERING,

AND

BUILDING.

"I am an Architect, and I take in *The Architect*."—Thomas Hardy's "A Laodicean."

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THE WEEK.

THE London County Council on Tuesday considered the subject of the proposed lunatic asylum at Bexley. The asylums committee proposed to obtain plans and estimates by competition, and recommended that they should be enabled to incur a preliminary expenditure of 2,000*l*. An amendment was moved to the effect that the cost of the building must not exceed 350,000*l*., and that an architect should be engaged who was to be paid by salary, and also all necessary assistants, to prepare the plans and to supervise the construction of the asylum. As fifty-seven votes were given for the amendment, and only thirty-five against, it was approved; but subsequently another amendment was adopted reducing the amount to be expended to 300,000*l*. An amendment which recommended that the committee should be asked to consider the advisability of engaging an architect to prepare plans and superintend the works for a fee of 10,000*l*. was negatived. The arrangement is further evidence of the animus of the Council towards architects. They are aware that from the overcrowded condition of the profession there will be no difficulty in obtaining architects who will gladly become district surveyors under the new arrangements, and consequently it is believed that a great many will compete for the temporary office in connection with the Bexley Asylum. Whether there will be much saving by a departure from the ordinary system remains to be seen. The Council expect of course that the architect will concentrate all his thoughts on the asylum, but the advantage of doing so is not apparent. Is he to become a substitute for a clerk of the works? In that case he would be needlessly expensive. It is not gratifying to discover that so many public bodies have not sufficient confidence in architects to entrust their commissions to them, for the London County Council did not initiate the change; but still more serious is the effect which is produced on the minds of ordinary clients. There are, however, many architects who are prepared to adapt themselves to the new conditions, and for the sake of assured employment to put the old master of works theory into practice.

It has been decided to erect a synagogue in the Commercial Road, close to its junction with Whitechapel, in substitution for one formerly located in Fenchurch Street, and demolished in 1892, but it is to be of much larger dimensions. The new synagogue will seat at least 1,000 male worshippers, and 400 female worshippers, and in connection with it there will be organisations designed especially to meet the requirements of the working-class Jews in the East End, a suitable court-house for the Beth Din (the Jewish Ecclesiastical Court presided over by the Chief Rabbi), and a Beth Hamedrash (Jewish house of study and library), which will be removed from its present quarters adjacent to the Great Synagogue in Aldgate. The approximate cost of the site is estimated at about 35,000*l*.

THE first report of the City Church Preservation Society has been prepared. Although the society has not yet completed a half-year's existence, it possesses about 150 members, and among the members of council are the Lord

Mayor, the sheriffs, and two of the members for the City. The committee report that they had taken action in two cases, viz., St. Ethelburga's Church, Bishopsgate, and the Church of All Hallows, Thames Street. The whole parish of St. Ethelburga had been aroused, and it was now generally believed that the church would be saved. As regarded All Hallows, a church about to be pulled down, the society had obtained counsel's opinion to the effect that, the site of the church being a disused burial-ground, any erection on it would be illegal. If that were so, the great inducement for pulling down churches would disappear, and it was hoped that further attempts at destruction would cease.

It is difficult to imagine what character a London Board school will have assumed when, if ever, the suggestions for the improvement of them come to an end. Lately it was proposed to make the schools serve for drilling-grounds, and to strengthen the floors for that purpose. Now they are to be made a sort of public baths. A Government inspector, it appears, considers that it would be advantageous to promote personal cleanliness among the boys. He therefore has recommended that at St. Clement's Road school, Notting Hill, a separate bath should be provided underneath the new hall; that the floor of the new hall be so constructed as to allow the whole or a portion to be easily removed; that a space be excavated under the floor, which will, when filled with water, and a movable portion removed, form a good and sufficient bath. The Board's architect said that three baths with a hot and cold supply could be set up in the school at a cost of about 200*l*. The works committee consider the recommendation should be carried out. The only obstacle appears to be a doubt about the legality of the expenditure. When an improvement or a change takes place in one school it is sure to be imitated elsewhere, and the manufacturers of baths are therefore likely to have a busy season before them.

MR. T. DREW, R.H.A., the assessor in the competition for the Mater Infirmorum Hospital, Belfast, has placed the plans of the following competitors according to their merits in the following order:—(1) Mr. J. W. FENNELLS, Belfast; (2) Mr. W. J. W. FERGUSON, Belfast; (3) Mr. GODFREY W. FERGUSON, Belfast; Mr. ANDREW J. GORDON, London; (4) Mr. A. J. JACKSON, Belfast. The preliminary competition having proved conclusive as to the excellence of planning, which is the main essential of hospital competition, the assessor has intimated that a second competition could not change the order of merit.

THE Glasgow Corporation have been fortunate in acquiring *The Boar Hunt*, by RUBENS, at the sale of the Adrian Hope Collection for 1,660 guineas. It is one of those bargains which are occasionally obtainable, although many experts are present. The picture, which measures 4 feet 6 inches by 5 feet 6 inches, is described in Smith's "Catalogue Raisonné," part 2, page 276, and was formerly in the collection of the late King of Holland. The auctioneer mentioned that at one time 1,000,000 francs (40,000*l*.) had been offered and refused for the work.

AUGUSTUS WELBY PUGIN.

IN 1830 AUGUSTUS WELBY PUGIN appeared in Edinburgh as a shipwrecked sailor (he was then a youth of nineteen) and called on GILLESPIE GRAHAM for assistance. The Scottish architect not only "rigged him out," to use PUGIN's words, but advised him to give up the contests with waters, winds and rocks, and to exercise his energy on architecture. His first efforts to educate himself could hardly be considered as encouraging, for before the year was over PUGIN, although still a minor, was arrested for debts which arose out of his experiment to combine theory and practice, business and study, by setting up as a carver of architectural ornament in Hart Street, Covent Garden. In the same year he married. Before he reached his majority he was a father and a widower. An ordinary man and especially one who was over-nervous would have succumbed under such a succession of adversities. But they were not all which weighed on him. If he could not make carving profitable, he thought it was at least possible to demonstrate that he was competent to build a house for himself. His "St. Marie's Grange," near Salisbury, was supposed to exemplify fifteenth-century arrangements, and there is no doubt it was singular in its exterior and uncomfortable within. After a very short occupation of it the model house was sold at less than one-fourth of the sum which PUGIN expended on the works. It might be supposed, therefore, that from such a succession of failures being associated with his name, PUGIN could not expect to gain confidence as an architect, yet in the course of a very few years he was one of the busiest architects in England, and certainly was more talked about than any of his contemporaries.

No less remarkable was the circumstance that he was able to secure commissions where the shrewdest man of business would say they were not to be found. When, soon after his minority came to an end, PUGIN abandoned the Church of England and joined the Roman Catholics, there was hardly one of their churches in all England in which he could pray with his eyes open. The buildings were such as could be erected by the pence collected from Irish labourers; and they were tawdry in their adornments, partly from poverty and partly from the belief that the majority of the worshippers were made happy by colours and forms that we presume would hardly be tolerated in a pre-historic period. Under persecution both clergy and people had so far degenerated as to forget that for centuries their Church was the inspirer, if not the creator, of productions in all the arts that were most noble. The rock that yielded at the touch of the leader's rod was not a more remarkable example of what can be accomplished by the mysterious influence that is in some men, than Roman Catholicism in England under the sway of AUGUSTUS PUGIN. Extraordinary sacrifices were gone through to realise visions which he set forth as if he were living in Mediæval times, when it might well be said, "Money was no object" to the projectors of the churches. The coldest men could not resist the glamour which he cast over their intellects. The Maynooth professors, all of them being rigorous logicians, when he prepared a plan of a college which was more uncomfortable than a prison, were blind to the defects of "the beautiful plan," and declared "there is no other person likely to be appointed who is in any degree equally qualified with Mr. PUGIN for executing buildings of

this kind"—a conclusion which they were destined to expiate by sufferings in their own studies and in their classrooms. The students of another ecclesiastical college—St. Edmund's, near Ware—were if possible more enthusiastic about PUGIN's "career of utility and fame," and expressed the hope that in the course of time they also would have commissions to entrust to him for new churches.

Of a different sort was the spell which PUGIN exercised over many of the more important representatives of the Church of England. They feared him. He might have been a magician who was likely by his fascinations to bring many innocent beings to destruction. The *British Critic*, which was the most able of all the Church quarterlies, in describing some of "Mr. PUGIN's magnificent interiors" wrote:—"It would be revenging ourselves, to our own most serious cost, if we refused to appreciate and profit by the splendid ideas which Mr. PUGIN's wealthy and zealous employers enable him to realise. We cannot, indeed, for a moment forget the misfortune that the direct results of this gentleman's labours and talents are lost to the English Church, nor can we think without grief of the many fair piles rising up around us, the shrines of a hostile communion. We scarcely know whether we can push our charity as far as the learned editor of the 'Memoirs of Oxford,' and 'rejoice to see such signs of good taste spreading among all classes of society of whatever religious denomination.' Still we think it both fair and wise to get all the benefit we can from every party."

Now the whole of the preceding passage is based on a delusion. It appeared in 1841, and expresses the belief that PUGIN, who was then no more than thirty, had accomplished most wonderful feats. If judged by the circumstances of the time they were wonderful, for in very few cases did he find "wealthy and zealous employers." PUGIN, who was a better judge of the difficulties which hampered him, could easily have proved to the apprehensive theologians that, however strong might be his desire to convert the majority of his countrymen to his new faith, yet, as PLUTUS was opposed to him, he could do but little. He wrote at a time when he

was supposed to be most successful:—"I have passed my life in thinking of fine things, studying fine things, designing fine things and realising very poor ones. I have never had the chance of producing a single fine ecclesiastical building, except my own church, where I am both paymaster and architect; but everything else, either from want of adequate funds, from injudicious interference and control, or some other contingency, is more or less a failure." The control to which he objected had also a financial origin, for when his fine pictures were not able to persuade men and women to become liberal, the clergy were justified in restricting the masonry until it bore some correspondence with the funds. PUGIN was therefore during a great part of his life a source of terror to friends and foes. The Protestant clergy believed "the preterpluperfect Goth" was undoing the moral effect of their sermons and of the Reformation, while the Catholics were afraid he was about to add to their misfortunes by making them all bankrupts. The timorous among the latter must also have had their misgivings about PUGIN's orthodoxy, for what was to be thought of a man who was depressed and miserable in Rome, and who could write in this style of things which have moved so many to



From a Painting by J. R. Herbert, R.A.

reverence?—"Were it not for the old basilicas and the associations connected with the early Christian antiquities, it would be unbearable—the Sistine Chapel is a melancholy room; the *Last Judgment* is a painfully muscular delineation of a glorious subject; the Scala Regia a humbug; the Vatican a hideous mass, and St. Peter's is the greatest failure of all." CHARLES DICKENS could not be more flippant in describing Renaissance art than was PUGIN. In Rome there is a good deal of tolerance for all those who exercise the right to differ when the subjects are buildings and pictures. PUGIN was presented with a gold medal by the Pope, but in England the denouncer of the importations of foreign ecclesiastical factories as "abominations" could never expect to gain the entire confidence of the higher or inferior clergy of his Church. PUGIN might be compared to one of those igneous or volcanic masses which disturb whatever comes in contact with them.

That he was endowed with extraordinary ability or force is certain, and it assumed a form which in his time was novel, and was therefore taken to be irresistible. Accident favoured him in an unusual way. As he bore a similar name, he inherited some of the reputation gained by his father in representing Gothic buildings and in making the illustrations acceptable to the public. In those days few cared to discriminate between the works of the elder PUGIN and the younger. The "Specimens of Gothic Architecture," "Architectural Antiquities of Normandy" and "Gothic Ornaments" appeared to be part of the same series as the "Gothic Furniture," the "Ironwork" and "Contrasts; or, a Parallel between the Noble Edifices of the Fourteenth and Fifteenth Centuries and similar Buildings of the Present Day," for between them come the "Examples of Gothic Architecture," on which father and son co-operated. Strangers were surprised when they saw AUGUSTUS WELBY PUGIN for the first time; his name was so long familiar they could not understand how he had resisted the operations of time.

His father's devotion to architecture as a means of gaining a living in a strange land would naturally create some interest for buildings in his son's mind, but as his father and mother both claimed to belong to feudal families, Mediæval remains appealed to his pride and imagination. The elder PUGIN was the most efficient "ghost" of his time, and it seemed likely that his son was marked out for that most useful office, which indeed he always exercised. But the cleverness of the lad in copying German prints at the British Museum surprised a goldsmith belonging to the firm of RUNDELL & BRIDGE, and PUGIN was invited to supply designs. In that way he was initiated into the mysteries of metalwork. Soon afterwards chance made a furniture designer of him. GEORGE IV. wished to have Windsor Castle furnished in befitting style. The commission was given to MOREL, a French upholsterer, who invoked the aid of his countryman, the elder PUGIN. The designs were prepared by his son. At Windsor he also met one of the supers at Covent Theatre, by whom he was introduced to the scene-painters' loft, and there he could observe how art of another sort was practised. In a short time he was engaged to design the architectural scenes which were required for an operatic version of "Kenilworth."

Having exercised his versatility repeatedly, PUGIN might well imagine that his knowledge was to be applied in other ways, and therefore it would be wise to make a more exact study of Gothic detail. There were no collections of casts sixty years ago in the museums, to which he could turn for inspiration. He therefore went to the buildings and amassed knowledge with a rapidity that surprises a modern student. PUGIN was not, however, the kind of man who could fill sketch-books and portfolios with as much placidity as an entomologist or a botanist can fill his cases. He had suffered as well as aspired, but apparently it was only hate which could make him put forth all his power. He found an enemy in JAMES WYATT, who had been killed by the breaking down of his carriage twenty years before, and pursued the unlucky ghost like one of the scourge-armed furies. He related in one of his letters how he visited Hereford, where he was disappointed by that commonplace city. "Maddened by the sight," he says, "I rushed to the cathedral; but horror! dismay! the villain WYATT had been there—the west front was his. Need I say more?

No. All that is vile, cunning and rascally is included in the term WYATT." Afterwards he wrote from Ely in the same strain:—"This monster of architectural depravity, this pest of cathedral architecture, has been here; need I say more? I wound myself up to the pitch to bear the sight of the havoc he had committed. The man, I am sorry to say, who executes the repairs of the building was a pupil of the wretch himself, and has imbibed all the vicious propensities of his accursed tutor."

WYATT'S operations imparted a new interest to the cathedrals and churches. They became to PUGIN beautiful beings that had been maimed for ever by the bungling hands of an unskilful surgeon. Henceforth they appealed to his pity as well as to his admiration. Next he became persuaded that the clergy who employed WYATT were still more blameable. "I feel perfectly convinced," he wrote to the same friend, "the Roman Catholic Church is the only one in which the grand and sublime style of architecture can ever be restored." With PUGIN ideas were the preludes of prompt action. Having once concluded that his mother's creed was not favourable towards art, he quickly abandoned it. The change will appear less remarkable if it is borne in mind that PUGIN was mastered by a Frenchman's love of system. While he could admire the Mediæval churches in England, they appeared to him to be unskilfully planned. But as soon as he applied himself to liturgical knowledge, then he found delight in tracing "the fitness of each portion of these glorious edifices to the rites for whose celebration they had been erected."

From its connection with religion architecture henceforth became to him not merely an art that was calculated to subserve utility, but one that was glorified. As a representative of it, PUGIN firmly believed that he was competent to explain doctrines, and there are large parts of his lectures in the Oscott College which might be supposed to have been delivered from the manuscript which some professor of theology had prepared for his own classes. It is needless to say Mediæval architecture alone was considered by him as qualifying a practitioner for so high an office. The Renaissance, which to his mind was only another name for Paganism, he regarded as a sort of dragon that was at all times and in all places seeking to devour. He saw his faith was endangered by every hour he spent among the buildings in Rome, and that the metropolis of Christendom should delight in such monstrosities of architecture was almost enough he said to make a man an infidel.

PUGIN is not to be understood unless we make allowance for the bias of his mind. The son of a royalist who fought against the first revolutionists, he would, if he had power, put the whole world under a hierarchical government. He once designed a wrapper for a penny popular magazine that was published in Derby, and he surrounded the page with medallions, in all of which clerics were dominant. Of course the magazine failed, but PUGIN'S principles were asserted.

One satisfactory result of his theory was a vindication of the connection between architecture and honest work. CARLYLE did not denounce the shams of society with more vigour than PUGIN displayed in dealing with those of building. And of the two the architect was the more successful. For as the *Times* wrote after PUGIN'S death, "Let us remember to his honour that if now there seems to be the dawn of a better architecture, if our edifices seem to be more correct in taste, more genuine in material, more honest in construction, and more sure to last, it was he who showed us that our architecture offended not only against the law of beauty, but also against the laws of morality." It should also be added that the honesty which PUGIN endeavoured to realise in architecture was also fostered by him in the numerous subsidiary arts to which he gave his aid as a designer or a producer. The book in which PUGIN is seen at his best is therefore his "True Principles of Gothic Architecture," in which, as his friend, Mr. FERREY, said, his aim "was to further the correct revival of ancient architecture by exposing the miserable way in which all branches of trade connected with Mediæval art were carried on, and the unsatisfactory result arising through the artifices and deceptions practised in the production of fabrics of every kind used in buildings of this description. Such true and incontrovertible principles are contained in this book that it may be safely affirmed we owe more to its influence in

correcting public taste than to all other causes combined. The simple and masterly manner, in which first principles are insisted upon constitute the key to the extensive usefulness of the volume, which is illustrated in the most happy manner by diagrams and sketches, all drawn and etched by himself."

PUGIN's book is as useful to-day as when it first appeared. On that account we have decided to reprint it in parts during the next few weeks, and students will be able to obtain what is a manual of the philosophy of architecture equally applicable to all styles at a fraction of the original cost.

"IS GOTHIC ARCHITECTURE A FAILURE?"—I.

[BY A CORRESPONDENT.]

NOT so many years since the asking of this question would have caused much surprise, and even more so at the commencement of the Gothic Revival, when the Cambridge Camden Society was a considerable force in leading public opinion in architectural matters. The answer would certainly in most cases have been, "Of course not!" though the older school of architects still refused to be seduced by the counter attractions of the resuscitated style. But "Thus does the whirligig of time bring about its revenge" to the more ancient phase of art, though scarcely in a manner that would be appreciated by the devout disciples of PALLADIO, who, could they see it, would be shocked by the great eclecticism in what is called Renaissance at the present day. The experiences of history will doubtless be repeated, and styles of architecture, like nations, will ever have their rise and fall if this world continues in its present form, and we are not nearing its last days, as is the opinion of not a few deep thinkers.

The subject which it is the earnest desire of the writer to consider, as far as possible, in a judicial spirit, must obviously be somewhat narrowed in its application, or otherwise the sufficient answer to it would extend to most unreasonable limits in these columns. It is, therefore, intended to confine these remarks to the English development of Gothic work, in the main, as also principally to secular and domestic buildings. For the question as to the adaptability of the Mediæval spirit to ecclesiastical structures has its ready reply in the fact of the large majority of new churches being designed in that style, notwithstanding the attempt made by Mr. NORMAN SHAW, a few years since, at St. Michael and All Angels, Chiswick, to carry out something of a "free Classic" type. The basilican church of St. Barnabas, Oxford, was an experiment by Sir ARTHUR BLOMFIELD also, and has not been followed by him in other new churches, which are decidedly Gothic. The late EDWARD J. TARVER likewise advocated a new departure of somewhat the same kind at a church proposed to be built at Telford Park, Streatham, where Portland cement concrete and trabeated construction was to supersede to a great extent that of the arch, somewhat after the type of the early Christian basilican churches of Rome. Subsequently the late JOHN D. SEDDING, at the church of the Holy Redeemer, Clerkenwell, designed an essentially Renaissance building, destitute of a Gothic feature in it. Though Holy Trinity, Sloane Street, the work of the same gifted hand, is much more Mediæval than Renaissance in spirit, it has many features of the latter. However, as has been before remarked, the Gothic school still, on the whole, retains its sway on English ecclesiastical architecture, notwithstanding these ebullitions of Classic energy, though the bias in many cases is towards the later phases of Gothic.

Now it is by no means, as was said at the onset, the intention of the writer to flaunt his colours as a partisan in the same way as was done at the so-called "Battle of the Styles," about a quarter of a century or so since. Most men are wiser now, and consider their differences more quietly, whether it may be in theology, politics, or in artistic matters. It certainly, however, by no means follows but that these feelings, at heart, of the combatants may not be very deep and sincere. Still, it is pretty generally conceded, at the present time, that it is better not to come to loggerheads, but to be broad-minded (not open-minded) up to a certain limit. Were such another as AUGUSTUS WELBY PUGIN to arise nowadays as the apostle of one

particular style, and write such a book as the "Contrasts," it would be unlikely to be appreciated by the public. For the times have changed greatly since that stirring work was brought out in 1836. Some twenty years later, in 1857, GEORGE GILBERT SCOTT published his "Secular and Domestic Architecture," but he was, of course, less vehement than had been PUGIN in expressing advocacy of Gothic work, and, moreover, was not imbued so much with the "odium theologicum" of that gifted man. Rather later, GEORGE EDMUND STREET took up the cudgels lustily on behalf of Mediæval architecture, and fought her battle with somewhat greater fire than had SCOTT, strongly evincing his detestation of modern Classic as applied to churches, sometimes dubbing it with the name of "Pagan" architecture, a curious instance of the extent to which a man's logic gets amiss when he goes in for extreme opinions. Then, in 1873, Mr. GRAHAM JACKSON wrote a *brochure* on "Modern Gothic Architecture," taking a much more independent line, and advising its development in a way he points out. It may be well at this point to say that the present writer, in order to keep his mind the more free, has advisedly refrained from re-reading or quoting from the books just mentioned. Neither has he re-studied Mr. CHARLES EASTLAKE'S "History of the Gothic Revival." So if, perchance, in this article he should appear to have plagiarised from these books, he must plead "Not guilty" to the charge. For history shows that men at all times have unwittingly and occasionally been led into identical trains of thought, without any communication whatever the one with the other. It is impossible to always avoid such coincidences. Thus far with this very slight historical reminiscence of some great pleaders for Gothic *versus* Classic. The former style having virtually gained the victory in this country, as applied to ecclesiastical work, its consideration in connection with secular and domestic buildings has now to be taken in hand by the writer.

For colleges and for structures of the character of the "Woodard" Schools (as they are still generally called, notwithstanding the modest protest of their first great Warden), for National schools, parsonages, small country villas and cottages, the sway of Gothic still in the main continues. But as regards the street architecture of cities or large mansions in the country, or municipal and other public buildings, including the London Board schools, the style adopted is most certainly not Gothic. Still, it is very unlikely that such a truly native product should ever vanish from this land. Though in the latter portion of the sixteenth century Gothic architecture became poor and debased, it never died out, and CARTER'S great publications stimulated public interest in the style and paved the way towards its revival rather more than half a century since. The books by AUGUSTUS PUGIN (the father of WELBY PUGIN), containing the excellent and correctly-measured drawings of Mediæval buildings, in which he was so ably assisted by clever pupils, likewise tended to help on the movement.

It will be well to look into some of the leading characteristics of the Mediæval school, as exhibited in secular and domestic architecture, and then compare them with those of the prevalent style, in the hope that some fresh light may be thrown upon the subject. The battle ground is not where it used to be in the conflict alluded to at the commencement of this article. For the buildings erected at the present day in the severe Classic type are few and far between, as compared with those in that mixed style, to which it is rather difficult to apply a proper epithet, as no one seems quite agreed on the point. Free Classic, or Queen Anne, will not suffice, but Neo-Classic is perhaps nearer the mark, though, indeed, as regards some buildings now put up a far less polite description might be very truly applied. It ought never to be forgotten (but often is) that art in its true sense has a catholic mission, and no man has a right to dogmatise about his own pet style to the exclusion of all others, though quite entitled to uphold the one he has most studied, loved and usually employed as the preferable. In fact, such enthusiasm is good for him and his work, so it is to be regretted that there is often much lukewarmness in such matters.

The true spirit of architecture is shown by the exercise of some common sense in the composition and details of the buildings to which proper principles are applied. But

unfortunately, in ancient as well as in modern work, this has but too frequently been overlooked, as is the case in many recent Free Renaissance structures. When the words "common sense" are spoken of in relation to ornament, it must be with some necessary limitations. Otherwise a building of the most utilitarian character might too often rear up its head, wanting in proportion and destitute of any beauty whatever. To strive in the composition so that every detail should have some meaning is obviously impracticable, though it is well to bear this in mind as a general principle. But it is not impossible in Gothic and other styles to eschew senseless ornament, to encourage the practice of purity and refinement in detail, and likewise to avoid overloading with decorative work—a crying failing at the present day, as has been recently pointed out in a public manner. Such aims are not peculiar to Gothic architecture, but applicable to any of the recognised styles of the world, though they may not be to some of those queer admixtures of a bastard kind.

One of the admittedly strongest points of the Gothic style is its extreme flexibility, its ready adaptability to circumstances, its way of getting over difficulties that at the first blush it would seem to have been impossible to tackle. No doubt this is to a considerable extent attained by the prevailing type of Free Renaissance as now practised, but not so absolutely. In Mediæval days, as in the colleges at Oxford and numberless other places, the heads of the windows are cusped, or in those of the Tudor period have four-centred arches to each light. For modern use, and except in halls two-storey high, or in staircases, it is generally considered more expedient and convenient to have square heads. The ridiculous notion that this treatment was not "Gothic" has long since exploded; for if properly studied, with sufficiently recessed jamb mouldings or chamfered orders in brick, terra-cotta or freestone, and possibly with suitable labels, mullions and transoms of sufficient apparent, as well as real, strength, we arrive at that charming feature which up to the present time has never been surpassed—"the mullioned window." Indeed, the latter was retained intact when the great impulse of the Renaissance wave that had spread over Europe was instrumental in giving to us that beautiful and characteristically English Elizabethan style which survived the Jacobean dynasty, and did not really come to an end during the time of the GEORGES. The mullion and transome may be said to have ever been with us since their initiation, though to a much reduced extent, and all through the eighteenth century. The features are, in truth, as much favourites now as in past years. When the so-called "Queen Anne" style was first resuscitated, mullions and transomes were of necessity left out in the cold. But numerous little panes of glass, with wood bars between them, soon failed to satisfy the eye or to properly fill the aching voids of large window openings. Substantial stone or terra-cotta mullions give a scale to the building, and appear to bind it together in a manner which no other scheme of fenestration will accomplish; for an enormous superficial extent of glass space can be occupied without the eye easily detecting it, or if doing so, being offended thereby, as, for example, in the famous Hardwicke Hall, Derbyshire, with its extraordinary amount of mullioned and transomed windows, popularly said to be equal in number to the days of the year—at any rate, it would take a very long time to count them all.

(To be continued.)

ARCHÆOLOGY OF THE HORNCastle DISTRICT.

THE annual meeting and excursions of the Lincoln and Notts Architectural Society were recently held, having, a correspondent of the *Guardian* writes, Horncastle as their centre. The peninsula, or "horn," between the little rivers Bane and Waring, on which Horncastle stands, was chosen by the Romans for a military station—Bannovallum, or the fort on the Bane—strengthened by walls, huge shapeless fragments of which still remain towards the river. The English named it "Hyrrn-ceaster," now modified into Horncastle. A curious fact in the history of Horncastle is its connection with the bishopric of Carlisle. It is "a far cry" from Cumberland to Lincolnshire; but in 1230 Walter Mauclerk, the fourth bishop of Carlisle, bought the manor, and in the early part of the next

century, when the army of Robert Bruce was devastating the Borderland and the bishop's house of Rose Castle had been sacked and burnt, Horncastle supplied a refuge to Bishop Halton, and the Pope, on receipt of a lamentable letter from the bishop, backed by one from Edward II., appropriated the benefice of Horncastle to the see. This inconvenient alliance survived in a much modified form to our own days, the bishops of Carlisle being patrons of the vicarage until some five and twenty years ago. By a triple exchange Bishop Jackson obtained the advowson for the see of Lincoln, the bishops of Carlisle being compensated by the living of Burgh-on-the-Sands, the place of the death of Edward I., which had belonged to Queen's College, Oxford, since its foundation, the college receiving in exchange the Lincoln living of Harlaxton.

The church of Horncastle is a good specimen of a moderate-sized town church, with Early English work on the base of its low square tower and its chancel arcade, Decorated arcades to the nave and a Perpendicular clerestory. Its main interest lies in the memories of the period of the Commonwealth it contains. On the walls hang a number of rusty scythe-blades used as extemporised weapons by the countryfolk at Winceby fight, and in the chancel aisle is the monument of Sir Ingram Hopton, the Loyalist commander, who fell while endeavouring to make prisoner of "the arch-rebel," Cromwell.

On leaving Horncastle on Wednesday morning the Society first visited the little Early English church of Ashby Puerorum, which takes its name from its having been appropriated in early days for the maintenance of the singing-boys of Lincoln Cathedral. They then passed on over the swelling wold-hills to the little village of Somersby, the birthplace of the late Poet Laureate. The church stands picturesquely on a steep bank overhanging the village. Near the south door is an almost unique example of a churchyard cross of the fifteenth century, entirely unmutated. A tall, tapering shaft bears the sacred emblem, protected by a gabled tabernacle, with sculptures of the Passion on one side and of the Blessed Virgin Mary and infant Saviour on the other. The church is very small and of the simplest character. From the unsymmetrical position of the church it seems once to have had a south aisle, now removed. Time only allowed a passing glimpse of the old-fashioned but perfectly commonplace front of the poet's birthplace, the old rectory now occupied by the lay-lord of the manor. Somersby certainly was too much hurried over—a fault extending to the whole excursion. As usual, too much was attempted, and consequently several places of interest comprised in the scheme were left out altogether, including to the regret of many the picturesque little village of Bag Enderby, Dr. Tennyson's other living, rich in reminiscences of the laureate's boyhood.

Omitting several of the churches visited, which presented no remarkable features, that of South Ormesby demands notice. Samuel Wesley the elder, the father of John and Charles, held the rectory here before he was transferred to Epworth where his famous sons were born, and in our own day it was held by the universally beloved and revered Chancellor Massingberd. The church restored and partially rebuilt by Massingberd is a typical English village church, standing high and solitary in a richly-timbered park, with the hall of the Massingberds reposing in the valley below and the rustic cottages of the village clustered in a scoop of the wolds at its feet. The church is a pleasing one with a good Early English arcade and pinnacled western tower and double-gabled Decorated chancel, and contains two fine brasses of the Skipwiths.

After lunch at the now disused hall at Harrington, and an inspection of the instructive series of Coppledyke monuments in the rebuilt church, reaching from the thirteenth to the seventeenth century, the members passed on to Old Bolingbroke. Of the famous historical castle, the residence of John of Gaunt and the birthplace of his son, Henry IV., held by the Royalists at the time of the battle of Winceby, 1643, and besieged by the Earl of Manchester, nothing remains save sundry mounds and earthworks and a piece or two of broken walling. The chief object of interest is the church. This, only the south aisle of the original church, is a beautiful example of flowing Decorated of the purest sort. The tracery of the windows cannot be surpassed for elegance. It has been recently restored in really admirable fashion by the late Mr. Fowler, of Louth, at the cost of a Lincoln corn merchant. A blocked northern arcade has been opened, a new north aisle built on part of the site of the original nave, the gables rebuilt and the roofs raised, a ritual chancel formed on the eastern bay, and the whole church well fitted and furnished.

Halting at Moorby to examine the curiously sculptured Decorated font in a modern church, the members reached Scirelby, in the wooded domain of the Dymokes, the hereditary champions of England. The church, though robbed of much of its interest by cruel restorations, still possesses the Early English arcades of its single north aisle, its richly carved chancel screen, and, most noticeable of all, the Marmion and Dymoke monuments, of which

the incumbent, Canon Lodge, gave a clear and instructive description. With Scrivelsby ended the first day's excursion. Of that of the second day, among the most interesting places visited was East Kirkby, an entirely unrestored church of Decorated date, full of interesting features, especially a curiously-sculptured Easter sepulchre, embellished with kneeling figures of the three Marys holding their caskets of spices. The whole church is in the most miserable state of squalor and neglect and threatened ruin. At Revesby there is a beautiful new church, the work of Mr. Hodgson Fowler, which owes its erection to Mr. Banks Stanhope and his noble-hearted kinsman, whose premature death not Lincolnshire alone, but the whole nation and its Church have to deplore. From Revesby the members passed on to Coningsby, a fine spacious church much injured by the mutilation of its clerestory, where a row of lancets have been converted into triangles with curved sides and an ill-designed modern apsidal chancel. The tall, plain, disengaged tower, of excellent stonework and dignified outline, stands on open arches, like that at Brading, in the Isle of Wight, and St. Mary's, Warwick. Within a short distance of Coningsby stand Tattershall Castle and Church, with which the excursion practically ended. Both of these buildings, equally remarkable as first-rate examples of the ecclesiastical and military architecture of the age, were the work of Ralph Lord Cromwell, Lord Treasurer to Henry VI., who died in 1455. The spacious cruciform church, once collegiate, with chancel and transepts of equal height with the clerestoried nave, is a typical specimen of Perpendicular at its best. After a long period of shameful neglect, when, robbed of its magnificent stained-glass, and the gaps unsupplied with any protection, the interior was left to the mercy of the elements, the chancel, which had become a roofless ruin, is now decently fitted up for worship, and the nave is slowly receiving substantial repairs. So noble a building, so utterly out of harmony with the wants of the scanty population, awakens a wish for Aladdin's lamp to transport it bodily to some large centre of population. Where it stands it is, and ever must be, comparatively useless, and a heavy burden on the incumbent and his parishioners. The magnificent series of brasses, the finest in the county, are all collected in the north transept.

Tattershall Castle consists of little more than the tall square keep-tower. It is a noble piece of red brickwork, now roofless, recalling the similar tower at the old palace of the bishops of Lincoln at Buckden. The fireplaces of the three chief stories, rich with heraldic bearings, are of vast size and magnificence. The corridors are exquisitely groined with brick-ribbed vaults. Each corner is strengthened with an octagonal turret, in one of which a winding stair gives access to the parapet walks on the summit, commanding splendid views towards Lincoln and Boston. This wonderful group of buildings, almost unrivalled in their date and style, formed a fitting termination to a too-much crowded but most agreeable two days' excursion.

TESSERÆ.

The Roof of Lambeth Library.

THE hall at Lambeth Palace was rebuilt at the cost of 10,500*l.* by Archbishop Juxon, 1660-63, in place of the former one built on the same site by Chichele, and demolished by Colonel Scott, one of the murderers of Charles I., to whose lot this palace fell in the division of the prey. Juxon ordered it to be built as much as possible like the old one, against the wishes and advice of others, who advocated a more modern style of building. On his death, after occupying the see only three years, he left directions for its completion according to his plan, provided his successor should consent. This is a very noble hall, 93 feet long by 38 feet wide and 50 high. The roof is undoubtedly a very grand one, but has great defects. The style is as mixed and corrupt as anything in that age. The open parts of the roof are all filled with Gothic tracery, while the great transverse arch is circular, and the ornament and pendant at the extremity of each hammer-beam is a complete Grecian entablature finished by a ball below, where the capital of the imaginary pillar would be. This is as great an anomaly as the entablature surmounting the external buttresses. The plan of the roof is evidently taken from that kind of roofs on the opposite side of the river, but it only adds to the defects of that structure. The collar is brought down considerably lower than in Westminster, thereby increasing the depth and apparent quantity of woodwork. Juxon was doubtless animated by a laudable desire to keep up the dignity of the see, and perhaps to prepare his palace for a revival of ancient manners, if the progress of human affairs should ever bring it about. Even in his time it was probably thought a hopeless attempt. The hall was rebuilt, but ancient hospitality is for ever fled. England will never again see the lord and his servants and retainers, down to his scullions and stableboys, and "eight or ten of the poor of the town by turn," all sitting down to one meal, sanctified by one blessing. Such a union of ranks is only to be

found in churches, and even there it bids fair to be soon obsolete. Some dread necessity, not to be wished for, or even thought of without horror, yet with its good as well as its evils, may some day drive rich and poor more into one another's society, and make them feel and pay their mutual debt. The hall has been a comparatively useless room ever since it was built, except for two months in 1780, when, in consequence of the disturbed state of the Metropolis, two or three hundred soldiers, with their wives and families, were quartered in the palace, dining in the great hall and attending divine service twice a day. It was converted into the archiepiscopal library under the directions of Mr. Blore.

Subject in Painting.

The imitation of nature, as it presents itself in space and figure, being the real sphere of plastic invention, it follows that whatever can occupy a place and be circumscribed by lines, characterised by form, substantiated by colour and light and shade, without provoking incredulity, shocking our conception by absurdity, averting our eye by loathsomeness or horror, is strictly within its province; but though all nature seem to teem with objects of imitation, the "choice" of subjects is a point of great importance to the artist; the conception, the progress, the finish and the success of his work depend upon it. An apt and advantageous subject rouses and elevates invention, invigorates, promotes and adds delight to labour; whilst a dull or repulsive one breeds obstacles at every step, dejects and wearies—the artist loses his labour, the spectator his expectation. The first demand on every work of art is that it constitute one whole, that it fully pronounce its own meaning, that it tell itself; it ought to be independent; the essential part of its subject ought to be comprehended and understood without collateral assistance, without borrowing its commentary from the historian or the poet; for as we are soon wearied with a poem whose fable and motives reach us only by the borrowed light of annexed notes, so we turn our eye discontented from a picture or a statue whose meaning depends on the charity of a cicerone or must be fetched from a book. As the condition that each work of art should fully and essentially tell its own tale undoubtedly narrows the quantity of admissible objects, singly taken, to remedy this, to enlarge the range of subjects invention has contrived by a *cyclus* or series to tell the most important moments of a long story—its beginning, its middle and its end; for though some of these may not in themselves admit of distinct discrimination, they may receive and impart light by connection. Of him who undertakes thus to personify a tale the first demand is that his invention dwells on the firm basis of the story, on its most important and significant moments or its principal actors. Next, as the nature of the art which is confined to the apparition of single moments forces him to leap many intermediate ones, he cannot be said to have invented with propriety if he neglect imperceptibly to fill the chasm occasioned by their omission; and, finally, that he shall not interrupt or lose the leading thread of his plan in quest of episodes, in the display of subordinate or adventitious beauties. On the observation of these rules depends the perspicuity of his work, the interest we take in it, and consequently all that can be gained by the adoption of an historic series.

Browne Willis.

Browne Willis, the first person who undertook a detailed and general Survey of the English Cathedrals, acquired his love for this pursuit by passing many of his idle hours in the Abbey when a Westminster boy. That Abbey was opened to the boys till they were deprived of a liberty which produced some injury to the monuments and some annoyance to the visitors and showmen. Browne Willis, who became one of the oddest of all odd men, had his share of peculiarities as a boy. The monuments were his books, and before he left school he imbibed there a love of churches and church antiquities which fixed the bent of his after life. He was a great repairer of churches and steeples, attended cathedrals and churches whenever he could so time his visits upon their dedication days; and when he went to Bath would lodge nowhere but in the abbey-house. A lively lady described him as having, with one of the honestest hearts in the world, one of the oddest heads that ever dropped from the moon. He wrote the worst hand of any man in England; it was more unintelligible than if he had learned to write by copying the inscriptions upon old tombstones. He wore three or four coats at once, each being of a different generation, and over them an old blue cloak lined with black fustian, all of which were girt with a leathern belt, giving him the appearance of a beggar, for which he was often taken in the course of his enthusiastic wanderings. His weather-beaten wig was of a colour for which language affords no name; his slouched hat, having passed the stage between black and brown, was in the same predicament as the wig; and the lower part of his equipments had obtained for him in his own neighbourhood the appellation of Old Wrinkle-boots, for during the wear and tear and repair of forty years, the said boots had contracted as many wrinkles as their quantum of calf-skin would contain, and consequently did no

reach half up the legs which they once covered. Being far too deeply engaged with past ages to bestow any portion of his thoughts and cares upon the present, he suffered a fair fortune to be deteriorated by neglecting his worldly affairs. And having lived long enough to hold a distinguished place among antiquities himself, he left behind him the character of a diligent and faithful antiquary, in which he will long continue to be remembered. Reputations of this class are not like those of fashionable authors, which come like shadows and so depart; they keep their place and make up in duration for what they want in extensiveness. Browne Willis did not complete his Survey of the Cathedrals. The work became the property of Osborne, the bookseller whom Johnson immortalised by knocking him down with a folio. Osborne advertised it as comprehending accounts of all, and the author considering this as an unwarrantable artifice, exposed the puff by a counter-advertisement.

Sculpture in Early Churches.

Sculpture was banished from the structures of the ancient Catholic Church; none displayed a greater modesty than those of Rome. The first Christian monuments upon which sculpture was employed are the ancient sarcophagi. In the catacombs the emblems of the dove, the fish, the anchor, the seven-branched candlestick of the temple, the palm-branch, the crown, rudely outlined upon the stone, indicate the resting-place of the veiled virgin, the priest, the confessor, or the martyr. When the sword of the prosecutor was sheathed, and the mourners might follow the relative to the cemetery without fear, the decent pride of sorrow was displayed upon the memorials, which frequently betray by their skill a hand trained in some school in which heathen traditions of art still prevailed. Christianity, however, controlled the pagan skill. The subjects, like those of the mosaics, were such as in themselves could never give a pretence for the sin of idolatry; a selection of types from the Old Testament, and of parables and miracles from the Gospel—Cain and Abel, Noah and the ark, the crossing of the Red Sea, Jonah and the whale, the marriage-feast of Cana, the multiplication of the loaves and fishes, and such like, constituted the only allowed ornament. Even these sepulchral monuments were never seen within the walls of the building, which, according to the emphatic words of the fathers and councils, was not to be defiled by death and corruption. It should seem as if the Western Church still entertained some lingering reluctance to incur the peril of transgressing the commandment "Non facies tibi sculptile," a commandment which may be violated but cannot be explained away. With the one exception of the statue of St. Peter and some decorations upon shrines, we do not believe that a single example can be adduced of a graven image within the walls of the earlier churches. Even the crucifix was only introduced by very slow degrees; it seems, generally speaking, that a feeling of reverence induced the early Christians to shrink, as it were, from representing the awful scenes of the Passion of our Lord.

Progress in Furniture.

In no point has there been so signal an improvement in modern times as in ordinary domestic furniture. The artisan now enjoys luxuries of this kind which were but three centuries ago beyond the reach of the crowned head. Even in the time of Elizabeth the comfort of a carpet was seldom felt, and the luxury of a fork wholly unknown. Rushes commonly supplied the place of the former, and the fingers were the invariable substitutes for the latter. Harrison, writing in the time of Elizabeth, thus describes the furniture in use immediately before his time:—"Our fathers (yea, we ourselves also) have lien full oft vpon straw pallets, or rough mats, covered onlie with a sheete, vnder coverlets made of dogswain or hopharlots (I use their own terms), and a good round log under their heads instead of a bolster or pillow. If it were so that our fathers, or the good man of the house, had, within seven yeares after his marriage, purchased a mattresse or flockebed, and thereto a sacke of chaff to rest his head vpon, he thought himself to be as well lodged as the lord of the towne, that, peradventure, lay seldom in a bed of down or whole feathers. As for servants, if they had any sheet above them it was well; for seldom had they any under their bodies to keep them from the pricking straws that ran oft through the canvas of the pallet, and rased their hardened hides." The lateness of the period at which the duxurious improvements in furniture were introduced is shown in Sir John Harrington's amusing reproaches of the "error rather than austerity" of those sticklers for old customs who looked upon cushions and carpets as heretical innovations. He asks:—"Doth it not as well become the state of the chamber to have easye quilted and lyned forms and stools for the lords and ladyes to sit on, as great plank forms, that two yeomen can scant remove out of their places; and waynscot stooles so hard, that since great breeches were layd aside, men can scant indewr to sitt on?" But though the balance in point of comfort is infinitely in favour of modern upholstery, on the other hand the splendour of our hangings, bed furniture and plate

is far inferior to that of the earlier periods. Carved and inlaid bedsteads, with hangings of cloth of gold, paled with white damask and black velvet, and embroidered with heraldic badges; blue velvet powdered with silver lions; black satin, with gold roses and escutcheons of arms; tapestry of cloths of gold and silver for hanging on the walls; gold plate enamelled with precious stones, and cloths of gold for covering tables—these are pomps and vanities occurring in every page of the elder time, and no doubt their effect must have exceeded in magnificence anything we see or hear of in the present day. These gorgeous "moveables" descended from generation to generation, and every ancient will is filled with bequests and inventories of them. Indeed, in the times that preceded the invention of those ingenious improvements upon the financial arrangements of our ancestors—Consols and Reduced Three per Cents.—and when the lending out money for hire was considered a disgraceful transaction, and almost confined to the Jews, such rich chattels, including plate and jewels, were employed as the most convenient, if not the only, investments of spare funds, being convertible into cash upon pledge or by sale at will.

Emblematic Painting.

Among the paltry subterfuges contrived by dulness to palliate the want of invention the laborious pedantry of emblems ranks foremost, by which arbitrary and conventional signs have been substituted for character and expression. If the assertion of Samuel Johnson that the plastic arts "can illustrate, but cannot inform," be false as a general maxim, it gains an air of truth with regard to this hieroglyphic mode of exchanging substance for signs, and the story which he adds in proof of a young girl mistaking the usual figure of Justice with a steel-yard for a cherry-woman becomes here appropriate. The child had seen many stall and market-women, and always with a steelyard or a pair of scales, but never a figure of Justice; and it might as well be pretended that one not initiated in the Egyptian mysteries should discover in the scarabæus of an obelisk the summer solstice, as that a child, a girl or a man not acquainted with Cesare Ripa, or some other emblem-coiner, should find in a female holding a balance over her eyes, in another with a bridge in her hand, in a third leaning on a broken pillar, and in a fourth loaded with children, the symbols of Justice, Temperance, Fortitude and Charity. If these signs be at all admissible, they ought at least to receive as much light from the form, the character and expression of the figures they accompany as they reflect on them, else they become burlesque instead of being attributes. Though this rage for emblem did not become epidemic before the lapse of the sixteenth century, when the cavalieri of the art, the Zuccheri, Vasari and Portas undertook to deliver more work than their brains could furnish with thought, yet even the philosophers of the art, in the classic days of Julio and Leo, cannot be said to have been entirely free from it. What analogy is there between an ostrich at the side of a female with a balance in her hand and the idea of Justice? Yet thus has Raphael represented her in the stanza of the Vatican. Nor has he been constant to the same emblem, as on the ceiling of another stanza he has introduced her with a scale and armed with a sword. The *Night* of Michel Angelo on the Medicean tombs might certainly be taken for what she professes to be without the assistance of the mask, the poppies and the owl at her feet, for the dominion of sleep is personified in her expression and posture; perhaps even her beautiful companion, whose faintly stretching attitude and half-opened eyes express the symptoms of approaching morn, might be conceived for its representative; but no stretch of fancy can in their male associates reach the symbols of full day and eve, or in the females of the monument of Julio II. the ideas of contemplative and active life.

Moisture and Masonry.

Water is the most destructive agent to construction. There is no quantity so small which, if repeated, is not ultimately fatal. The softest as well as the hardest material must yield to its insidious attack. No adage more true than "Gutta cavat lapidem." Our forefathers knew the connection between moisture and decay in soft material. Hence in the buildings of the districts where the soft stones prevail, the bottom courses of the walls will frequently be found to be formed of a hard and impervious stone, the strata of which are called by the quarrymen foundation-stone. Walls always above or always below water may, under certain circumstances, be laid without mortar. When between wind and water they never should.

Quoins.

Quoins of buildings and walls should always be carefully protected in the foundations, and well bonded in the superstructure. At the angles unequal settlement most frequently shows its effects, but when quoins are well supported they will keep up a weak wall. The Gothic architects were well aware of this; hence the immensely projecting buttresses at the angles of their lofty towers.

NOTES AND COMMENTS.

A PORTRAIT of Mr. L. HARVEY, after a painting by Mdlle. RAPIN, which was exhibited in this year's Salon, has appeared in *La Construction Moderne*. Instead of accompanying it with a biography, the occasion has been utilised by Mr. HARVEY to make an appeal to the French architects for a cause which he has at heart, and for which he has undergone many sacrifices, viz. the study of masonry in its noblest expansions. What he says does not apply to France alone, but to all countries where men are not satisfied to employ stone in forms that are better adapted for timber construction. Let it be once admitted that arching and vaulting are preferable to the lintel, although the latter may have received consecration by Greek hands, and it must follow that an almost infinite variety of curved surfaces can be introduced in architecture if competent designers and workmen are forthcoming. Mr. HARVEY points out that it is only in modern times that the association between architects and designs on paper became intimate. In earlier times architects, as it were, thought out their designs as solids, for they grew up among buildings, and could realise the effect of the smallest detail with a sort of prophetic vision. In our busier but less happy and less simple age, the substitute for the old training must be found in a mastery of stereotomy, that will be exhibited by operations in clay, stone and wood. As an old student of the *Ecole des Beaux-Arts*, Mr. HARVEY recommends that practical courses should be introduced in which building materials should be employed. Moreover, he suggests that all candidates for a diploma should have at least two years' experience as workmen, and in order that opportunities should be available he proposes that all contractors for public buildings should guarantee employment as apprentices to a certain number of students. Mr. HARVEY points out that a similar system of training is in operation in England for engineers who are ambitious to serve on the public works of India. Both in France and England there is a necessity for a change, as he perceives a tendency to be suspicious of the practical skill of architects, and consequently people apply to contractors for designs as well as for tenders.

IN France it would be feasible to carry out Mr. HARVEY's proposals, although at first Academicism might object to meddling with vulgar materials. Among us the obstacles are of another sort. There is no national school corresponding with the *Ecole des Beaux-Arts*, and in the substitutes, for it lines on paper, are supposed to confer efficiency in building on all who employ them. For several years Mr. HARVEY has been organising a system of instruction, in which practical masonry in its amplest developments formed the groundwork, and the skill attained by the students has been evidence that the effort was worthy of the support of all who are anxious to see architectural construction become something more than a veiling of steel and iron girders, which in many cases are employed to evade difficulties which could be overcome by a more congruous style. If Mr. HARVEY could have remained in London, there is little doubt that his classes at the Guilds Institute and his College of Masonry would have become institutions of a permanent character. But as he has been called back to Geneva, there is, of course, a risk that when deprived of his enthusiastic spirit they may not thrive. We have little doubt that some of the senior students would endeavour to carry on Mr. HARVEY's work, but support of other kinds are needed which can be given by a public body. The County Council, the Corporation, the City Guilds, the various architects' and builders' societies, and the governors of the new polytechnic institutes, have therefore an opportunity to render a service not only to architects and builders, but to the public, by fostering the classes until they become self-supporting. Let us hope that, singly or combined, they will be equal to the occasion.

THE decision given on Monday in *OAKLEY v. LENEY*, which was tried before Mr. Justice CAVE, is advantageous for people who will take houses in the country but will not accept the burthen of the lands adjoining. Two years ago the plaintiff became tenant of a house at Chilham, near

Canterbury. The defendant, who was the landlord, heaped a large quantity of manure near the house. It soon began to emit the odour which is dear to agriculturists. The plaintiff, however, did not enjoy it, and several months were allowed to elapse before the nuisance was removed. The plaintiff's wife was attacked by blood-poisoning, and was compelled to remain in Margate under medical treatment for a long time. Damages amounting to 500*l.* were claimed. There was the usual conflict of testimony by the experts at the trial. The local doctors who attended the patient considered the blood-poisoning was probably caused by the smell of the manure. Dr. FIFE, of London, considered that 88 yards was not a sufficient distance to render a manure heap innocuous, for in one of the official reports cases were mentioned where the source of danger was 300 yards distant. Dr. BOND, on the contrary, considered it was most improbable that the manure caused the illness, for before the septic germs could have travelled over 88 yards they would be oxidised by the air and rendered harmless. Mr. Justice CAVE took what might be called the common-sense view of the case. He said there was evidence to show that the smell was horrible. Consequently there was a nuisance. The question was, did it cause the illness? If the germ theory be true, blood-poisoning is caused by the introduction of septic germs into the system. These generally come by breathing foul air, as a rule sewer gas, or by drinking water or milk. In the present case the water need not be considered, and the drains did not reflect credit on the man who put them in, but they had been in the same state throughout, while the illness was only contemporary with the presence of the manure. An inference could be drawn from that stronger than any theories of doctors, that the manure caused the illness. As the judge was not satisfied with the form in which the plaintiff's accounts were rendered, he gave judgment for 150*l.* and costs. The case will form an important precedent, but agriculturists are likely to consider it as another mode of interference with their interests. It should, however, be remembered that the defendant had assumed responsibilities by letting his house, and his tenant should not be sacrificed for the sake of the farm.

M. JOSEPH CARRIÈS, the sculptor, has died in Paris in his thirty-eighth year. He was one of the few artists whose names appear in the official lists without any announcement of their teachers. M. CARRIÈS, who was a native of Lyons, was in fact a self-taught sculptor and decorator, and therefore occupied an exceptional position. His busts, however, were much admired, and he gained one of the medals of the Salon in 1881. It was anticipated that he would introduce a new application of pottery to decoration. He received a commission from an American lady for the decorations of a hall, which occupied him during several years, but as the work was not completed at the time of his death, it is uncertain whether art will be much enriched by his experiments.

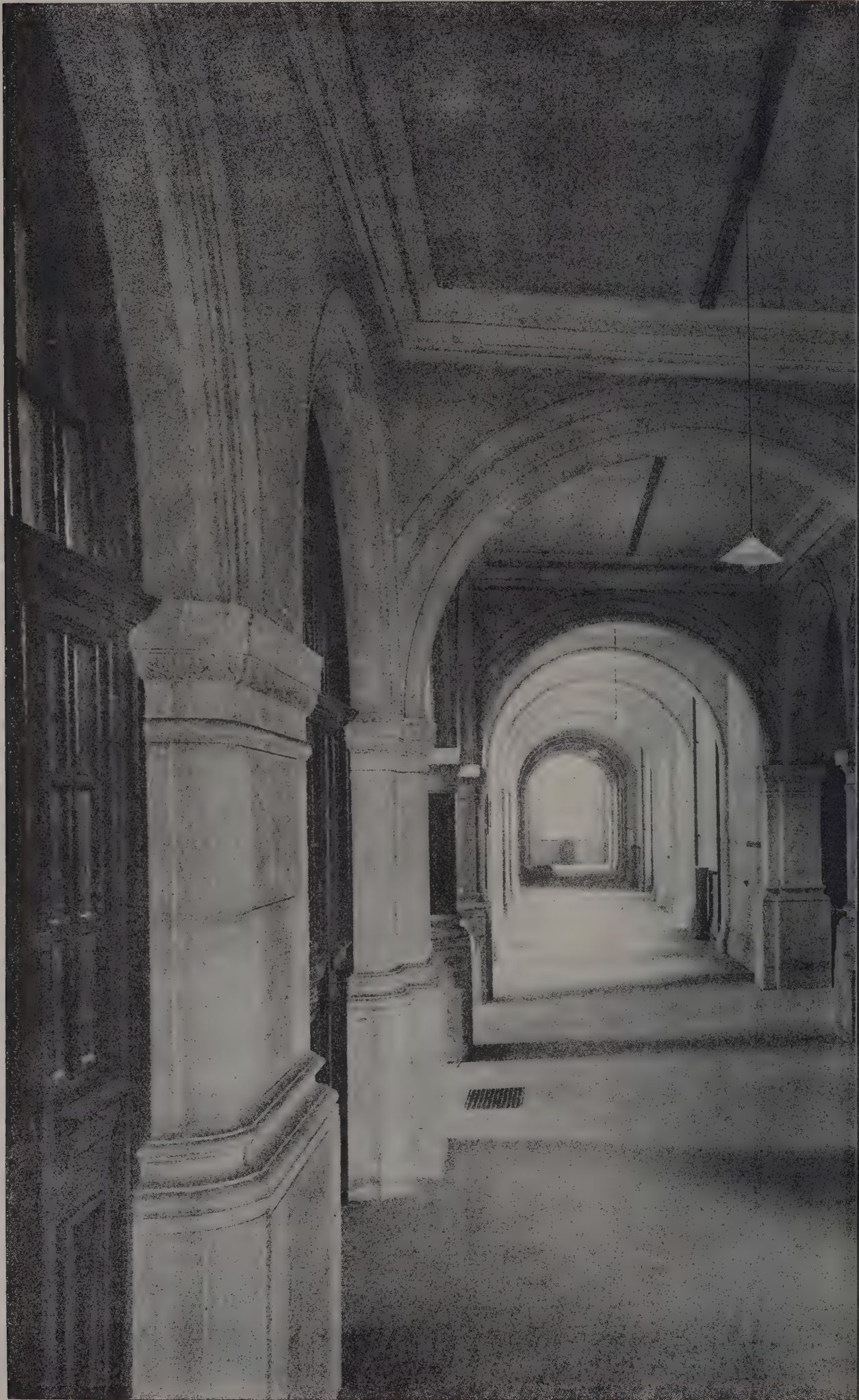
AMERICANS and other visitors to Westminster Abbey must be amazed when they find that Sir WALTER SCOTT has not a memorial in Poets' Corner or elsewhere. There is, however, a medallion of the Last Minstrel, but it is in the clerk of works' office, which strangers are not likely to seek out. Seven years ago subscriptions amounting to 171*l.* were received by a memorial committee, and they paid 157*l.* to the late Sir JOHN STEELL for a medallion which was, it is said, made to the dimensions indicated by Mr. PEARSON, R.A. But when the medallion arrived the architect considered it was out of scale and not suitable to the Abbey. With that opinion the Dean and Chapter agreed, and it was confirmed by some non-official advisers who were consulted on the matter. Sir JOHN STEELL when he heard of the decision was of course disappointed, but he could only hope that the authorities would subsequently take a more favourable view of his work. That time has not arrived, and meanwhile SCOTT's name does not appear in a place for which it is worthy, and the most popular author of the century might therefore be supposed to have been another BYRON.



Old Forest, July 6th 1894.



THE ILLUSTRATION OF THE



PHOTOGRAPHED BY BEDFORD, LEMERE & CO

July 6th 1894.



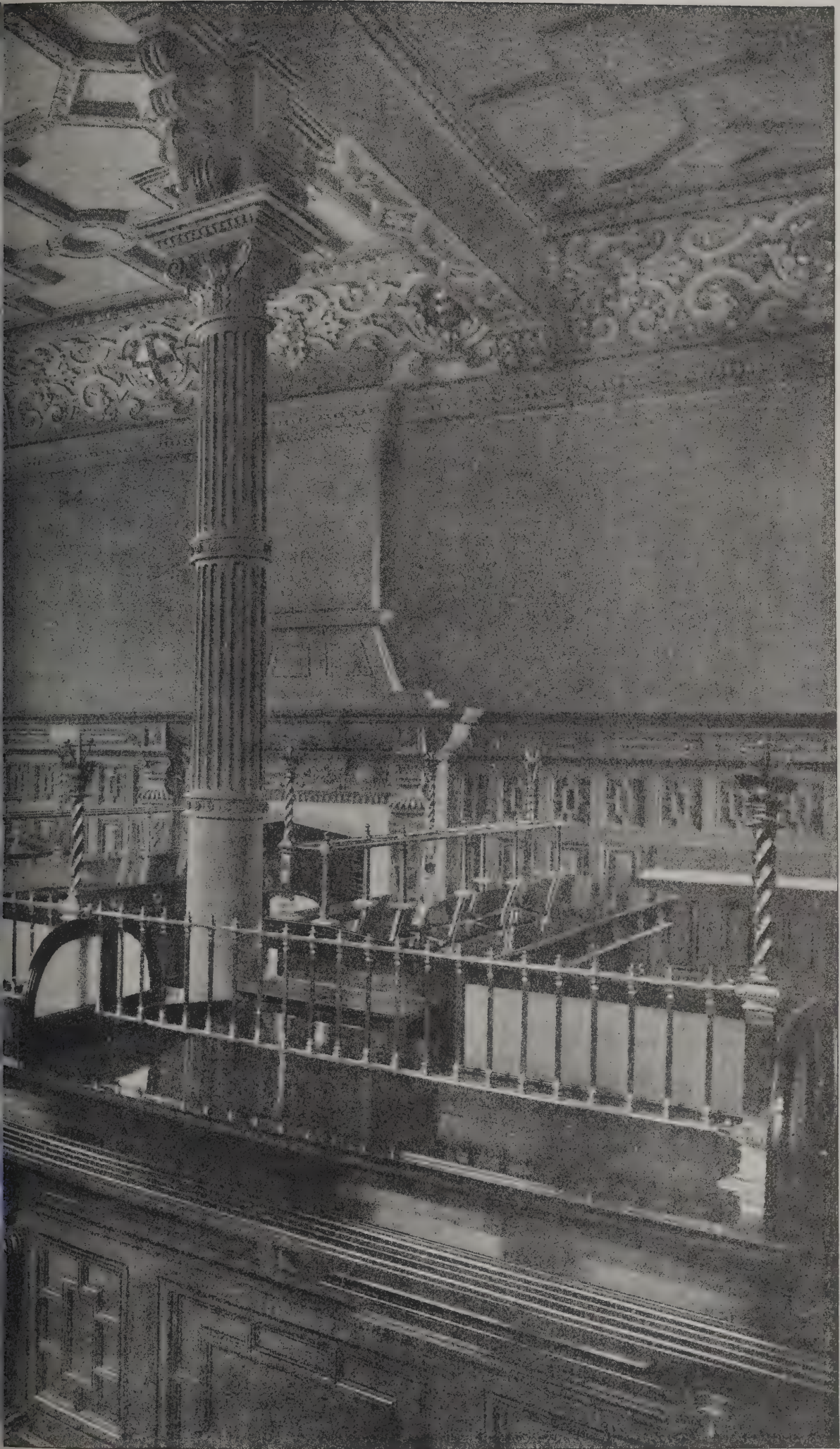
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CHNIC: CORRIDOR.
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ILLUSTRATIONS.

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BATTERSEA POLYTECHNIC—CORRIDOR.

INTERIOR—LINCOLN AND LINDSEY BANK.

SOCIETY OF ARCHITECTS.

THE following report of the Council of the Society of Architects on the question of examination for membership appears in the current number of the *Journal* of the Society:—

On June 26, 1894, the Council adopted the following report of the committee on the examination of members:—

The subject of the desirability or otherwise of an examination of candidates for membership was referred to the Council at the annual general meeting held in October 1893, and since then it has been under careful consideration. A committee was appointed, and drew up a series of questions, which were approved by the Council and submitted to the members of the Society. The replies received have been considered, and the opinion of the members appearing to be practically unanimous, the Council have decided as follows:—

1. That after October 31, 1896, election to membership will only be open to candidates who have passed the Society's examination, with the following exceptions:—(a) Candidates who are not less than thirty-five years of age and have been directly engaged professionally in architectural pursuits as principals for at least seven years; (b) candidates who are not less than thirty-five years of age and have been directly engaged professionally in architectural pursuits as assistants for at least ten years.

Candidates applying for membership under (a) and (b) will be required as heretofore to submit drawings and other proofs of their professional abilities.

2. That the scheme of examination shall be formulated and published before June 30, 1895.

3. That a register of students between the ages of seventeen and twenty-three years be opened on November 1, 1894. Registered students shall be pupils or assistants in architects' offices and be nominated by a member of the Society, subject to the approval of the Council.

4. Registered students shall be entitled to the following privileges:—Free admission to lectures to be delivered under the direction of the Council in London and the Provinces, a ticket giving admission to the Society's ordinary meetings and the use of the Society's library for reference, and a copy of each issue of the *Journal*.

5. That each registered student shall be required to pay 5s. per annum on November 1 in each year, and shall cease to be a registered student on October 31 next, after his attaining the age of twenty-three years.

The above report will be laid before members at the annual general meeting in October next, of which due notice will be given.

DUNDEE INSTITUTE OF ARCHITECTURE.

THE annual meeting of the Dundee Institute of Architecture, Science and Art was held on Thursday, the 28th ult., Mr. William Mackison presiding. The secretary (Mr. J. J. Henderson), in submitting the annual report, stated that the Institute had now completed the tenth year of its existence. The membership at present was as follows:—Members, 54, being the same as last year; associates, 167, six less; and honorary members, 8, one less. According to the new scheme for the division of the country into districts promulgated by the Royal Institute of British Architects, Dundee had been made the centre for that part of Scotland north of the Forth, with the view to the fostering of architectural education in the district. A copy of the report of the conference held at Liverpool for considering the Royal Institute's scheme was sent to each member and to gentlemen interested in fine art education. Principal Peterson, in acknowledging receipt of a copy, wrote:—"There can be no doubt that Dundee needs to take a forward step in regard to the higher forms of art teaching. I have sometimes thought that the day would come when we should have in Dundee a professor of fine art, who would take under his wing such special and even more technical teaching as might be required. The difficulty is to get the right man; but if such a chair were founded, and the right man secured, I have no doubt he would make his influence felt, not merely by theoretical lecturing, but also by associating himself with every movement for the teaching or the appreciation of art in its various practical applications." It was also stated in the report that Edinburgh and Glasgow Institutes had sent copies of their sketch-books,

and it was suggested that a sketch-book should be started in connection with Dundee Institute. Mr. Robert Hunter, the treasurer, submitted the financial statement, from which it appeared that there was a balance of 16*l.* 19*s.* 11*d.* in hand. The reports were adopted. The following office-bearers and Council were elected:—President, Mr. Robert Keith; vice-president, Mr. Leslie Ower; members of council, Messrs. G. G. Maclaren, James Foggie, William Briggs, and William Nixon; secretaries, Messrs. J. J. Henderson and George Jamieson; treasurer, Mr. Robert Hunter; auditors, Messrs. T. M. Cappon and James Hutton. The Chairman, speaking of the past session, said he was not so sure if their departure from the lecture system was altogether wise, as the lectures had always been a benefit. He expressed a hope that the matter of the sketch-book would be taken up by the new council. On the motion of Mr. Charles Ower, seconded by Mr. Keith, the following addition was made to rule 25:—"But members who are practising architects shall constitute a special section of the Institute, with full power to frame their own laws and regulations, and to deal with all questions affecting professional practice." On the motion of Mr. Keith, a hearty vote of thanks was awarded to Mr. Mackison for the way in which he had conducted the work of the Institute during the past year. He expressed the hope that, although Mr. Mackison no longer held office, he would continue to take an interest in the Institute. Mr. Mackison, in reply, thanked the members of council for the assistance they had given him.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE Manchester meeting of the British Archæological Association promises to be one of considerable importance. A strong local committee, of which the Lord Mayor of Manchester is the chairman and Messrs. J. Holme Nicholson and G. C. Yates are the hon. secretaries, has been formed, and the arrangements are in a forward state. The Congress, which lasts a week, opens July 30, when the members will be received by the Lord Mayor. Visits will be paid to the cathedral and Chetham's Hospital, and in the evening a conversazione will be given by the Lord Mayor in the Town Hall. On subsequent days there will be excursions to Chester, Whalley Abbey, Mytton Hall and Church Stydd Chapel, Gawsorth, Congleton, Astbury, Little Moreton Hall, Nantwich, Blackstone Edge, &c. On Friday Sir William Bailey will give a mayoral conversazione in the Peel Park Museum, Salford. Four evening meetings will be held for lectures and papers. These include an address by Mr. Albert Wyon on the "Great Seals of England," which will be illustrated by limelight, and papers by Mr. S. Andrew, Dr. Colley-March, Dr. Hoppell, Mr. W. E. A. Axon and others on "Roman Remains Around Manchester," "The Blackstone Edge Road," "The Visitations of the Plague in Lancashire and Cheshire," &c. The meetings and excursions, it should be said, will be open to ladies, and facilities are given for the attendance of non-members at the evening meetings.

THE CZAR'S MEMORIAL CHAPEL.

A CORRESPONDENT of the *Times* writes:—The Czar and Czarina have returned to Peterhoff from Borki (between Kursk and Kharkoff), where the consecration of the new church of the Saviour, in commemoration of the preservation of the Russian Imperial Family in the terrible railway accident of November 1888, took place on Tuesday morning, June 26. Of all the numerous shrines, chapels and icons set up all over the empire to commemorate the providential escape of the Czar at Borki this one is the most beautiful and striking. The memorial consists of two structures—the one a chapel or oratory built into the side of the railway embankment just where the dining-saloon car containing the Czar and his family was pitched by the accident, and the other a magnificent church in the Muscovite style of the seventeenth century, capable of holding about 700 persons, built a short distance from the embankment out on the open steppe on the spot where their Imperial Majesties helped to alleviate the sufferings of those who had been injured. The church is now surrounded by a park of about 18 acres, in which have been planted 70,000 trees. The entire work has cost about 250,000 roubles (25,000*l.*), collected by public subscription, besides the gifts of land, church ornaments and paintings. The church has the form of a high cupola surrounded by six conical towers, the façades being in yellow bricks, with elaborate ornamentation in which the double-headed eagle plays a conspicuous part. A finely ornamented iron staircase leads down from the railway on either side of the chapel. Within the latter are black marble tablets bearing the names of all those who were killed—namely, 23, and injured 36. Professor Makofsky has spent two years and a half in decorating both the church and chapel with his best work in religious art.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.*

By A. WELBY PUGIN.

THE object of the present lecture is to set forth and explain the true principles of Pointed or Christian architecture, by the knowledge of which you may be enabled to test architectural excellence. The two great rules for design are these:—First, that there should be no features about a building which are not necessary for convenience, construction or propriety; second, that all ornament should consist of enrichment of the essential construction of the building. The neglect of these two rules is the cause of all the bad architecture of the present time. Architectural features are continually tacked on buildings with which they have no connection, merely for the sake of what is termed effect; and ornaments are actually constructed, instead of forming the decoration of construction, to which in good taste they should be always subservient.

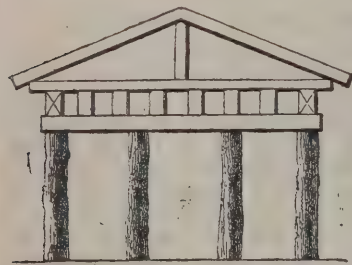
In pure architecture the smallest detail should have a meaning or serve a purpose; and even the construction itself should vary with the material employed, and the designs should be adapted to the material in which they are executed.

Strange as it may appear at first sight, it is in Pointed architecture alone that these great principles have been carried out, and I shall be able to illustrate them from the vast cathedral to the simplest erection. Moreover, the architects of the Middle Ages were the first who turned the natural properties of the various materials to their full account, and made their mechanism a vehicle for their art.

We shall have therefore to consider ornament with reference to construction and convenience, and ornament with reference to architectural propriety. Construction must be subdivided and treated under three distinct heads—stone, timber and metal; brick might indeed be added, but as the principles of its construction are similar to those of stone, I shall not make any distinction; and as for plaster, when used for any other purpose than coating walls, it is a mere modern deception, and the trade is not worthy of a distinction.

To begin with stone. A Pointed church is the masterpiece of masonry. It is essentially a stone building; its pillars, its arches, its vaults, its intricate intersections, its ramified tracery, are all peculiar to stone, and could not be consistently executed in any other material. Moreover, the ancient masons obtained great altitude and great extent with a surprising economy of wall and substance; the wonderful strength and solidity of their buildings are the result, not of the quantity or size of the stones employed, but of the art of their disposition. To exhibit the great excellence of these constructions it will be here necessary to draw a comparison between them and those of the far-famed classic shores of Greece. Grecian architecture is essentially wooden in its construction; it originated in wooden buildings, and never did its professors possess either sufficient imagination or skill to conceive any

departure from the original type. Vitruvius shows that their buildings were formerly composed of trunks of trees, with lintels or brestsummers laid across the top, and rafters again resting on them. This is at once the most ancient and barbarous mode of building that can be imagined; it is heavy, and, as I before said, essentially wooden; but is it not extraordinary that when the Greeks commenced building in stone, the properties



A Wooden Building the origin of Greek Temples.

of this material did not suggest to them some different and improved mode of construction? Such, however, was not the case; they set up stone pillars as they had set up trunks of wood; they laid stone lintels as they had laid wood ones, flat across; they even made the construction appear still more similar to wood by carving triglyphs, which are merely a representation of the beam ends. The finest temple of the Greeks is constructed on the same principle as a large wooden cabin. As illustrations of history they are extremely valuable, but as for their being held up as the standard of architectural excellence, and the types from which our present buildings are to be formed, it is a monstrous absurdity, which has originated in the blind admiration of modern times for everything Pagan, to the prejudice and overthrow of Christian art and propriety.

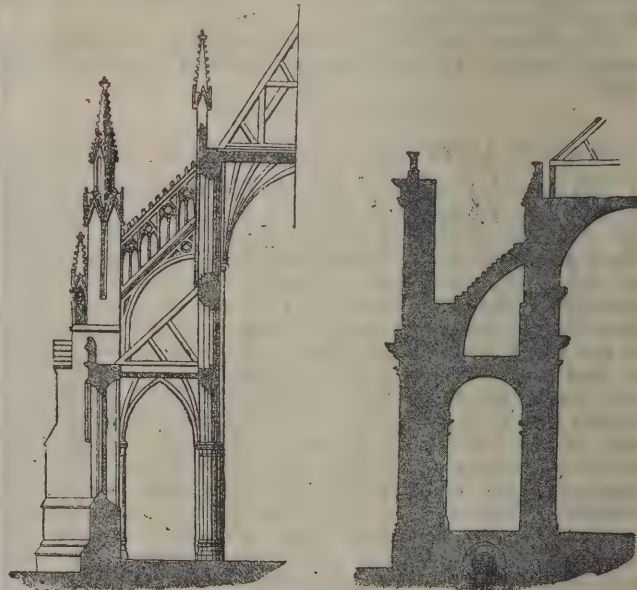
The Greeks erected their columns like the uprights of Stonehenge, just so far apart that the blocks they laid on them would not break by their own weight. The Christian architects,

on the contrary, during the dark ages, with stone scarcely larger than ordinary bricks, threw their lofty vaults from slender pillars across a vast intermediate space, and that at an amazing height, where they had every difficulty of lateral pressure to contend with. This leads me to speak of buttresses, a distinguishing feature of Pointed architecture, and the first we shall consider in detail.

It need hardly be remarked that buttresses are necessary supports to a lofty wall. A wall of 3 feet in thickness, with buttresses projecting 3 feet more at intervals, is much stronger than a wall of 6 feet thick without buttresses. A long unbroken mass of building without light and shade is monotonous and unsightly; it is evident, therefore, that, both for strength and beauty, breaks or projections are necessary in architecture. We will now examine in which style, Christian or Pagan, these have been most successfully carried out. Pointed architecture does not conceal her construction, but beautifies it; classic architecture seeks to conceal instead of decorating it, and therefore has resorted to the use of engaged columns as breaks for strength and effect. Nothing can be worse. A column is an architectural member which should only be employed when a superincumbent weight is required to be sustained without the obstruction of a solid wall, but the moment a wall is built the necessity and propriety of columns cease, and engaged columns always produce the effect of having once been detached, and the intermediate space blocked up afterwards.

A buttress in Pointed architecture at once shows its purpose, and diminishes naturally as it rises and has less to resist. An engaged column, on the contrary, is overhung by a cornice. A buttress, by means of water tables, can be made to project such a distance as to produce a fine effect of light and shade. An engaged column can never project far on account of the cornice, and all the other members, necessarily according with the diameter of the column, would be increased beyond all proportion. I will now leave you to judge in which style the real intention of a buttress is best carried out.

I have yet to speak of flying buttresses, those bold arches, as their name implies, by which the lateral thrust of the nave groining is thrown over the aisles and transferred to the massive lower buttresses. Here again we see the true principles of Christian architecture, by the conversion of an essential support of the building into a light and elegant decoration. Who can stand among the airy arches of Amiens, Cologne, Chartres, Beauvais or Westminster and not be filled with admiration at the mechanical skill and beautiful combination of form



Section of a Pointed Church, with the Flying Buttresses decorated.

Section of St. Paul's, London, a Church built in the revived Pagan style, with the Flying Buttresses concealed by a Screen.

which are united in their construction? But, say the modern critics, they are only props, and a bungling contrivance. Let us examine this. Are the revived pagan buildings constructed with such superior skill as to dispense with these supports? By no means; the clumsy vaults of St. Paul's, London, mere coffered semi-arches, without ribs or intersections, have their flying buttresses; but as this style of architecture does not admit of the great principle of decorating

* Two lectures delivered at St. Marie's, Oscott.

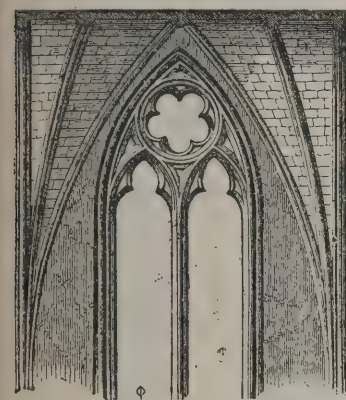
utility, these buttresses, instead of being made ornamental, are concealed by an enormous screen, going entirely round the building. So that, in fact, one half of the edifice is built to conceal the other. Miserable expedient! worthy only of the debased style in which it has been resorted to.

It is proper to remark that the cluster of pinnacles at A are not carried up for mere ornament, but, by their weight, to increase the resistance of the great pinnacle at the point of thrust.

We will now proceed, in the second place, to consider groining and vaulting, which are solely adapted to stone construction.

A groined ceiling is divided into compartments by means of ribs springing from caps or corbels, and uniting in bosses placed at the intersections; the spaces between the ribs are termed spandrels; the word "boss" signifies a spring of water, and has doubtless been applied to the keystones of vaults, as the ribs seem to spring or separate from them.

Here again the great principle of decorating utility is to be observed. A stone ceiling is most essential in a large church, both for durability, security from fire,* and conveyance of sound. It is impossible to conceive stone ceilings better contrived than those of the ancient churches; they are at once light, substantial, beautiful, and lofty.

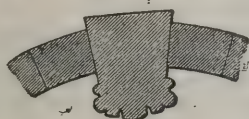


Groining.

1. They are light, because, their principal strength lying in the ribs, the intermediate spaces or spandrels are filled in with small light stones. 2. They are substantial, for all the stones being cut to a centre and forming portions of a curve, when united they are capable of resisting immense pressure, the keys or bosses wedging all together. 3. They are beautiful, for no ceiling can be conceived more graceful and elegant than a long perspective of lines and arches radiating from exquisitely carved centres. 4. They are lofty, not only on account of the elevation at which they are placed, but that their construction permits the clerestory windows to be carried up level with the crown of the arch in the intermediate spaces.



Pendant.



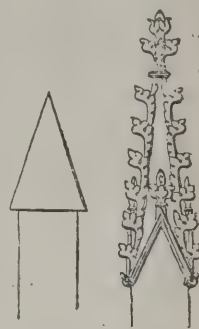
Boss.

In the groining of the later styles we find a great departure from the severe and consistent principles I have been describing. Henry VII.'s Chapel at Westminster is justly considered one of the most wonderful examples of ingenious construction and elaborate fan groining in the world, but at the same time it exhibits the commencement of the bad taste by constructing the ornament instead of confining it to the enrichment of its construction. I allude to the stone pendants of the ceiling, which are certainly extravagances. A keystone is necessary for the support of arched ribs; the older architects contented themselves with enriching it with foliage or figures, but those of the later styles allowed 4 or 5 feet of unnecessary stone to hang down into the church, and from it to branch out other ribs upwards. This is at most an ingenious trick, and quite unworthy of the severity of Pointed or Christian architecture.†

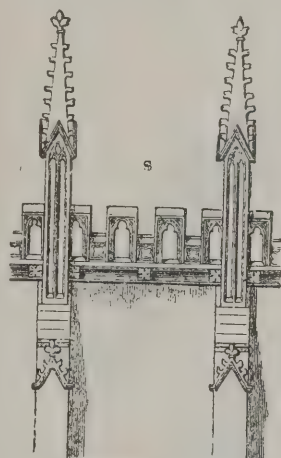
* Within the last few years the roofs have been burnt off the cathedrals of Rouen, Chartres, and Bruges; and, owing to the strength of the stone vaulting, the interiors of these churches have scarcely been injured; while York Minster has twice been completely gutted within a short period through the want of a stone groining, and yet a mere wood and plaster ceiling has been again constructed.

† This is one among many other symptoms of decline apparent in the later works in the Pointed style. The moment the flat or four-centred arch was introduced, the spirit of Christian architecture was on the wane. Height or the vertical principle, emblematic of the

In the third place we will proceed to the use and intention of pinnacles and spiral terminations. I have little doubt that pinnacles are considered by the majority of persons as mere ornamental excrescences introduced solely for picturesque effect. The very reverse of this is the case, and I shall be able to show you that their introduction is warranted by the soundest principles of construction and design. They should be regarded as answering a double intention, both mystical and natural: their mystical intention is, like other vertical lines and terminations of Christian architecture, to represent an emblem of the Resurrection; their natural intention is that of an upper weathering to throw off rain. The most useful covering for this purpose, and the one that would naturally suggest itself, is of the form represented in the annexed figure: only let this essential form be decorated with a finial and crockets, and we have at once a perfect pinnacle. Now the square piers of which these floriated tops form the terminations are all erected to answer a useful purpose; when they rise from the tops of wall buttresses, they serve as piers to strengthen the parapet, which would be exceedingly weak without some such support. Fig. S.



Pinnacles.



Floriated Pinnacles.

Their utility on the great piers which resist the flying buttresses has been already mentioned under the head of buttress. At the bases of great spires the clusters of pinnacles are also placed to increase strength and resistance; in short, wherever pinnacles are introduced in pure Pointed architecture, they will be found on examination to fulfil a useful end.

The same remarks will apply to the crocketed and floriated terminations of staircase and other turrets, which are in fact ornamented roofs, and I need hardly remark that turrets were not carried up without a legitimate reason.

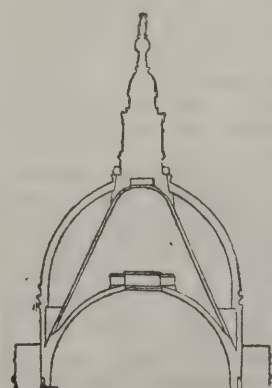
Every tower built during the pure style of Pointed architecture either was, or was intended to be, surmounted by a spire, which is the natural covering for a tower; a flat roof is both contrary to the spirit of the style, and it is also practically bad. There is no instance before the year 1400 of a church tower

Resurrection, is the very essence of Christian architecture. It was to attain greater elevation with a given width that the Pointed arch was employed; and the four-centred arch does not possess equal advantage in this respect with the old semi; and although some of the later buildings, as King's College Chapel, Cambridge, still retain the principle of internal height with the use of the depressed arch, yet who can avoid being struck with the inconsistency of running up walls to a prodigious elevation, and then, instead of carrying out the principle, and springing a lofty groin, losing a considerable increase of height by a flattened thrusting arched ceiling, the form of which is a sort of contradiction to the height at which it is commenced?

I do not make this observation by way of disparaging the merits of this stupendous building, but merely to show the early decay of the true principles of Pointed architecture which may be traced even in that glorious pile.



Tudor Bulb.

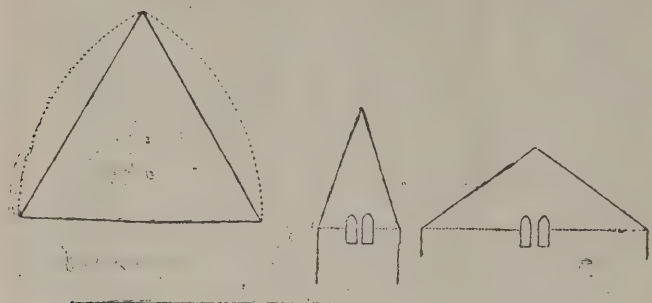


Section of the Dome of St. Paul's.

We not unfrequently find the bulbous form employed in the Tudor period: this, which afterwards became the prevailing form of the Dresden and Flemish steeples, is of the worst possible taste; and why? Because it is a form which does not result from any consistent mode of constructing a covering, and, on the contrary, requires by its shape to be constructed, as will be seen by the sketch; by the side of which I have placed a spire, the severe form and decoration of which are quite consistent with the true principles of rendering the necessary roof or covering of a tower elegant in appearance, without departing from essential construction for the sake of ornament. (Sketch in next part.)

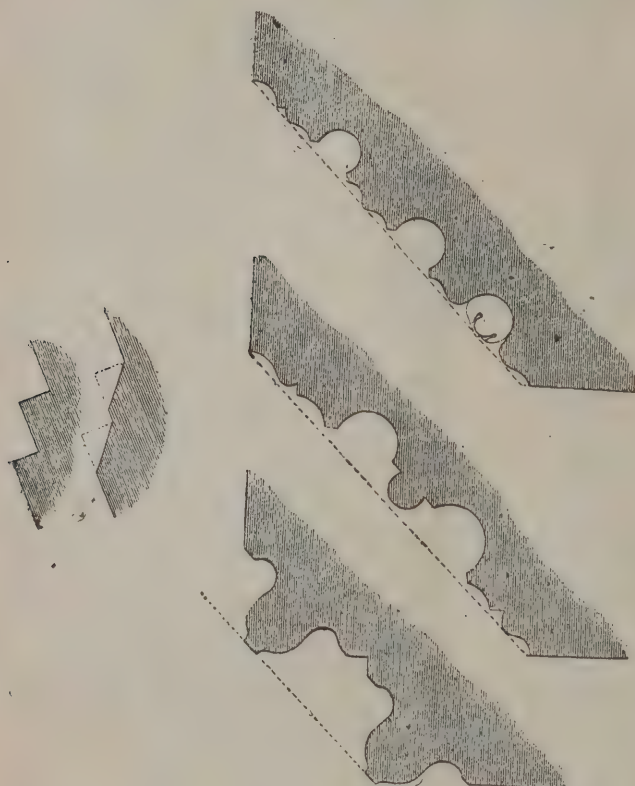
One of the greatest defects of St. Paul's, London, is its fictitious dome. The dome that is seen is not the dome of the church, but a mere construction for effect. At St. Peter's the dome is the actual covering of the building, and is therefore constructed in that respect on

being erected without the intention at least of being covered or surmounted by a spire; and those towers antecedent to that period which we find without such terminations have either been left incomplete for want of funds, weakness in the sub-structure, or some casual impediment—or the spires, which



Pitch of Roofs.

were often of timber covered with lead, have been pulled down for the sake of their material.* In fine, when towers were erected with flat embattled tops, Christian architecture was on the decline, and the omission of the ancient and appropriate



Examples of Ancient Jamb Moulds.

termination was strong evidence of that fact. Towers surmounting gatehouses were never terminated by spires, for

the true principle; but, as will be perceived by the annexed section, the upper part of St. Paul's is mere imposing show, constructed at a vast expense without any legitimate reason.

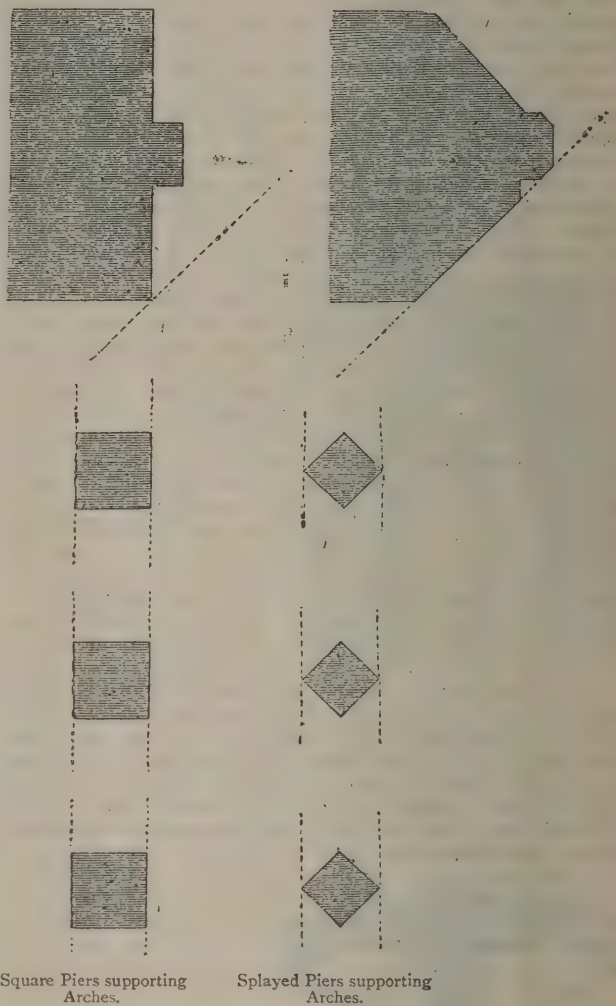
From the various symptoms of decline which I have shown to have existed in the later Pointed works, I feel convinced that Christian architecture had gone its length, and it must necessarily have destroyed itself by departing from its own principles in the pursuit of novelty, or it must have fallen back on its pure and ancient models. This is quite borne out by existing facts. Now that the Pointed style is reviving, we cannot successfully suggest anything new, but are obliged to return to the spirit of the ancient work.

Indeed, if we view Pointed architecture in its true light as Christian art, as the faith itself is perfect, so are the principles on which it is founded. We may indeed improve in mechanical contrivances to expedite its execution, we may even increase its scale and grandeur; but we can never successfully deviate one tittle from the spirit and principles of Pointed architecture. We must rest content to follow, not to lead; we may indeed widen the road which our Catholic forefathers formed, but we can never depart from their track without a certainty of failure being the result of our presumption.

* The following glorious churches have been stripped of their spires since the views in Dugdale's Monasticon were taken:—Hereford Cathedral, Worcester Cathedral, Southwell Minster, Rochester Cathedral, Ely Cathedral, Ripon Minster, Finchal Abbey, and Lincoln Cathedral. It is to be remembered that those views were taken above a century after the lead-stripping and spire-demolishing period commenced.

being originally built for defence, the space at top was required for that purpose. This is the real reason why square-topped and embattled towers are said to be of a domestic character; so that even by persons unacquainted with the use and intentions of spires, they are associated with the idea of ecclesiastical architecture.

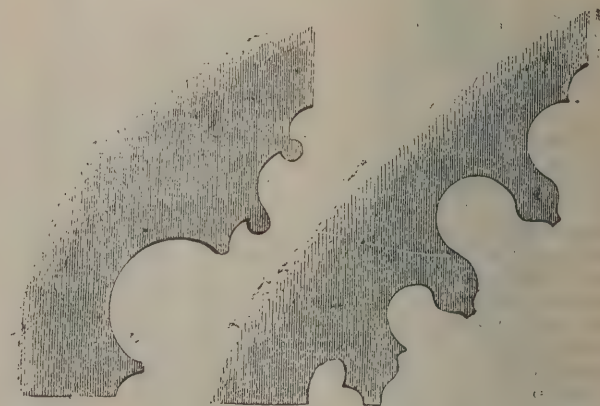
The pitch of roof in Pointed architecture is another subject on which some useful observations may be made. It will be



Square Piers supporting Arches.

Splayed Piers supporting Arches.

found on examination that the most beautiful pitch of a roof or gable end is an inclination sufficiently steep to throw off snow without giving the slate or lead covering too perpendicular a strain, which is formed by two sides on an equilateral triangle.



Modern Jamb Mould, weak and wiry.

French Jamb Mould of the late Styles, extravagantly hollowed.

If this form be departed from, the gable appears either painfully acute or too widely spread. All really beautiful forms in architecture are based on the soundest principles of utility.

Practical men know that flat-pitched roofs, which are exceedingly ugly in appearance, are also but ill calculated to resist the action of weather. In slated roofs especially, gusts of wind actually blow under and lift up the covering; when the pitch is increased to its proper elevation, the whole pressure of the wind is lateral, and forces the covering closer to the roof.

(To be continued.)

THE RESTORATION OF ST. MICHAEL'S CHURCH, LINLITHGOW.

PASSENGERS on the Edinburgh and Glasgow Railway, when looking out from the carriage windows to catch a glance of the historic Palace of Linlithgow, must have also noticed the large, imposing grey church with its square tower, standing on the same eminence and partially hiding the view of this ancient residence of the Kings and Queens of Scotland. This is St. Michael's Parish Church, dedicated to the patron saint of the town, and one of the finest and most complete of the ecclesiastical edifices of Scotland. But of the many people who have visited the palace, so rife with associations of the Stuart Kings—where Margaret mourned the slain at Flodden, and where James and his daughter, Mary Queen of Scots, were born, comparatively few have seen the interior of St. Michael's Church, though its west doorway is within the Royal grounds. One explanation of this is, the *Scotsman* says, that perhaps the good people of Linlithgow were rather ashamed of the state into which the interior had fallen and gave no facilities for the admission of visitors. It was cut up by a brick partition, disfigured by unsuitable galleries, marred by whitewash, and had altogether been allowed to assume an aspect of neglect and decay. This reproach will soon, however, in great part be rolled away. The local conscience has been awakened, and a vigorous effort is at present being made by a committee of heritors and burghers to have the church restored to something like its ancient dignity. To that end a sum of 3,000*l.* has already been raised, which, however, will not cover the cost of a complete restoration of the edifice to its primitive simplicity and dignity such as the committee, having put their hand to the work, might have aimed at; for St. Michael's is a building worthy to rank with the ancient cathedrals of St. Giles, Edinburgh, St. Mungo, Glasgow, or Dunblane. But what is being done is on right lines. The modern partition between nave and chancel has been removed, and the galleries, erected about 1812, when the chancel was fitted up as the parish church, have been cleared away, and with the best results. The inside floor, which had been raised a foot above its original level, burying thereby the bases of the piers, and obliterating the step between it and the chancel, has been lowered, and among other necessary work which will be undertaken will be the rebuilding of the chancel arch, the formation of a heating chamber on the site of the old vestry, the renewing and altering of the heating apparatus, and the reseating of the church. A few weeks ago several gentlemen interested in the preservation of our old ecclesiastical and other buildings visited St. Michael's along with Mr. Honeyman, Glasgow, the architectural adviser of the committee, and suggested that the scheme now in progress should be completed (1) by cutting out a plaster ceiling of late introduction, which took the place of the original open oak roof, and which crushing down upon the clerestory windows dwarfs the height of the interior; (2) that an oak roof should be substituted for the pitch pine at present hidden by the plaster roof; (3) to put in choir stalls and screens; (4) to restore the broken mullions of the triforium; (5) to restore the crown on the tower; and (6) to erect a vestry in harmony with the present building. Mr. Honeyman advised that for other 7,000*l.* these desirable works could be accomplished, but unfortunately at Linlithgow they have not yet found a Dr. Chambers, as at St. Giles, or, as at Dunblane, a wealthy gentlewoman, to bear the cost of the restoration, and a majority of the local committee have not seen their way to incur such a responsibility, though they were urged to do so, and to make an appeal to their fellow-countrymen for funds to carry through so patriotic an object. If the funds are forthcoming, however, they will only be too glad to proceed with the extended scheme.

St. Michael's Church dates from a very early period. At what date a church first existed upon this site is not known. David I., "the sair sanct for the Croun," is credited with having planted one of his many religious houses here. Alexander II. partially rebuilt the church about 1242, and the western tower reaches back to the reign of Robert II., who is said to have contributed 1*l.* 6*s.* 8*d.* towards the expense of its erection. The present church, it is believed, dates from about the middle of the fifteenth century. It is the opinion of experts that the nave, transepts and chancel had been erected from a complete design and within a short period of each other. It has been described as "assuredly the most important specimen of an ancient parochial church now existing in Scotland." The interior dimensions are from east to west 180 feet, from north to south 65 feet; and the transepts—for the church takes the form of a cross—are 100 feet across. The plan comprises a nave of four bays, the transepts, a chancel of three bays and a trigonal apse, with three large Perpendicular four-light windows, which recently were filled in with stained-glass, and constitute a memorial to the late Professor Sir Wyville Thomson, of the *Challenger* Expedition, who was a native of the district. There is a triforium on each side of the nave, with pointed and hooded openings divided into two lights; and in the clerestory

there is a range of two-light windows, with pointed heads, comprised under a semicircular arch, carried right along the walls of nave and choir. There is no triforium in the choir. It may give some better idea of the stately dimensions of St. Michael's when it is mentioned that the central aisle of the nave is rather wider than that of Glasgow Cathedral, or of the cathedrals of Lichfield and Norwich, while the side aisles are about two feet wider than those of St. Giles. The nave and chancel piers are square in plan, moulded at the angles into four heavy rounds, between each of which is a round of a smaller size. Each face thus presents a cluster of three pillars—those of the nave having a lighter and more elegant character than those of the choir. The capitals are plainly moulded, and the masonry above to the triforium string course is simply and in some places rather roughly built. Higher the courses are set with much greater care. The aisles and transepts are vaulted throughout. The groining is simple, though the mouldings are rather fuller than those of the corresponding period in England. The ribs are tied at the intersections with sculptured bosses, on which such devices as the pierced heart and hands and feet, a *fleur de lys*, the cross and crown and the Scottish lion appear, with the bright colours which had adorned them still adhering to them. The arms of the burgh are to be seen in the transepts; but the carving on most of the bosses is now obliterated. The mouldings and the details of the vaulting shafts belong rather to the Decorative period than to the Perpendicular style. The aisle windows are large and are filled with flamboyant tracery, with a pleasing variety of form.

The lower stage of the west tower is open to the church, and contains a large Perpendicular window of three lights in the west face, and a large doorway underneath, in the form of a cross, which forms the principal entrance. Externally this doorway has some fine architectural characteristics. At this end of the church there are a number of exceedingly interesting features worthy the attention of the student of ecclesiastical architecture and archæology. On each side of the main entrance there is a shallow recess containing a stone seat 8 feet in length. Overhead is a canopy formed of soffit foliations. These benches, it is suggested, may have been the beggars' seats. On each side of the tower arch within the nave are two apertures or windows. One of these, it is suggested, was the lepers' window, this idea receiving countenance from the fact that outside the church at this spot there had evidently stood a low covered shed of some kind; or, on the other hand, it may have been the window through which the daily dole was passed to the poor. Between two of the windows of the north aisle of the nave was the royal entrance, now blocked up. Inside, this doorway is quite plain; outside it is ornamented with moulded hood and carvings. It faces a small door on the south front of the palace.

The exterior of the church, while massive and stately in aspect, shows a greater amount of ornamental details than the interior, though, unfortunately, these are only remains of its former greatness. Finely-carved and hooded niches occur all round the buttresses, and in these formerly stood statues of the saints, but they were all destroyed save one, by the Lords of the Congregation, on their march from Perth to Edinburgh. At the same time were cast down, as savouring of Popery, the four-and-twenty altars of which St. Michael's Church could boast. The statuette that was spared was that of St. Michael, the patron saint of the town; and he stands in his niche still, his foot on a dragon, at the south-west end of the church, a little frayed by the hand of time. The gargoyles have also been ruined by wind and weather, or more active agents.

A very beautiful feature of the building is the "Galilee Porch," two storeys in height, with crow-stepped gable, which is built opposite the second bay of the nave on the south side. It has pointed and moulded doorways both outside and opening into the church, and a groined roof ornamented with moulded ribs tied in the crown with a sculptured boss. A sculptured bracket and canopy of large size are affixed to the east inner wall, and a small pictorial bracket, representing an angel bearing an open scroll, appears immediately above the crown of the inner doorway. The upper floor of this *pavil* or porch is known as the priest's room—an apartment 13 feet 6 inches by 11 feet 2 inches, which has round its wall several deeply-recessed cupboards. It has an elegantly corbelled and capped projecting oriel window of three lights, out of which the priest in the olden days would probably put his hands to bless the people as they left the church. At the level of the corbelling, on the outer face of the gable, on each side of the window, are two large canopied niches. The name "Galilee porch" carries the suggestion that here were allowed to gather during service excommunicated persons and others not in full communion with the Church. The entrance to the priest's room is by a newel stair in a turret in the angle between the aisle wall and the porch. At the top of the turret is a doorway opening upon the leads, and a little way along the gutter to the east, and piercing the nave roof dormer-wise, is another small door, which is the only entrance to the triforium on this side.

The south transept, popularly known as St. Katherine's

aisle, is a beautiful part of the interior. Its vaulted roof is ornamented with horizontal and diagonal moulded ribs, the latter springing from single-filleted shafts set in the angles. A stone seat is carried along on both sides; there is a large aumry in the west wall, and two enriched brackets on the wall opposite. The gable of this transept is almost entirely occupied by a six-light window filled with flamboyant tracery of pleasing and effective form. It was in St. Katherine's aisle where King James IV., "very sad and dolorous, making his devotion to God to send him good chance and fortune on his voyage," received the mysterious warning not to go to war with England, which is recorded by Lindsay of Pittscottie in quaint phraseology, and which forms the subject of Sir David Lindsay's tale in "Marmion":—

In Katharine's aisle the monarch knelt,
With sackcloth shirt and iron belt,
And eyes with sorrow streaming.

The warning was delivered by a "ghostly wight" in a white cincture, who stepped from the crowd of knights sitting in the aisle under their banners; but when the surprise which the incident awakened had abated, the augur could nowhere be found. The incident is generally regarded as having an historical basis, and was one of several attempts made in that superstitious age to awe the king into the abandonment of the expedition to England which ended so disastrously for himself and the nation at Flodden. It may not be uninteresting to mention in this connection that, in clearing out the aumry in the aisle, it has been discovered that a shaft of some size goes straight up from it, and if there is an outlet, it must apparently be sought for in the room above. Is there anything here to account for the disappearance of the ghostly wight? One of the other historical incidents connected with the church may just be referred to. It appears that in 1646, when the plague was raging in Edinburgh, the University classes were removed to Linlithgow and conducted in the church, which was partitioned into a number of classrooms for their reception.

The exterior walls of the church are generally in good order, though they bear numerous marks of Cromwellian bullets. It is recorded that when on his march in 1651 to Stirling, after the battle of Dunbar, the Protector took the palace and church from the Royalist garrison after assault, and fortified it on his own account. Some of his soldiers slept in the triforium of the church, the war-horses were stabled in the nave, and trenches were thrown up in the churchyard. Some of these trenches existed until the beginning of this century, for in the minute-book of the heritors there are payments noted at that time for filling them up. Between 1638 and the Restoration the inhabitants of Linlithgow seem to have been subjected to all the rigours of the church discipline of that Spartan period, when the sword of Cæsar was not evoked in vain to uphold the decisions of the Church Courts. An excerpt from the minutes of the kirk session of the period will show how far these were carried. The quotation is from Mr. Waldie's interesting history of the town:—

"1647, May 3.—Ordainis the Bailie thatt visits on the Sabbothe in the foirnoone and lykways the elder who visits in the afternoon to accompany the minister throughe the toun in the afternoon after sermone everie Sabbothe for taking notice who ar att familie exercise or catechizing, reiding or the lyk exercise beseiming the Sabbothe; and who ar not, thatt they according to their fault may be punished.

"Ordainis thatt, upon the Sabbothe, none be sein upon the streat till sex hours att night without ane lawfull occasion otherways to be punished as a Sabbothe breaker."

It was perhaps this repression, coupled with the losses the town sustained by the Cromwell visitation, that caused the burghers to welcome the Restoration with so much joy, the minister of St. Michael's, a certain Mr. Ramsay, along with the Dean of Guild Mylne, having in their zeal crowned the festivities on the occasion by the burning of the Solemn League and Covenant. In the olden Catholic days, St. Michael's, it may be observed, was under the jurisdiction of St. Andrews, and many of its vicars and deans rose to high positions in the Church. It was one of its ex-deans who became a Bishop of Dunkeld, who, for an offence against his office, was adjudged by the Pope to build the apse of St. Michael's Church.

But the damage the church sustained from the reforming zeal of the Lords of the Congregation and Cromwell's troopers was nothing when compared to what the interior received from the vandalism of those who, when art was at a discount in the country, converted the choir into the parish church. The congregation after the Reformation had worshipped in the nave, but about 1812 it was resolved to remove into the chancel. This was done at a cost of about 3,000*l.*, one-third being paid by the heritors, and the other two-thirds by the Town Council. As the partition was at the west side of the transept, the chancel arch, which was thought to be in the way, was taken down and the responds cut clean away. Holes for beams to carry the galleries between the bays were knocked in the aisle walls and in the piers, and in one case at least one of the piers

has been pierced through and through, and has otherwise been so mauled that it is feared it will have to be rebuilt. The bases of the piers and those of the vaulting shafts of the aisle having come in the way of pews and pipes, had been deliberately hacked off; while at a previous period the nave had been smeared with whitewash to such an extent that it required a strong solution of hydrochloric acid to take it off the stone. Interments were frequent in the nave and chancel, and in stripping the pillars and walls there have been laid bare a large series of initials and dates in black paint upon the stone, all relating to the last century, which, it is supposed, constitute a record of burial. There are many sculptured crosses on the aisle walls. These are "dedication crosses," and behind them it is popularly believed there had been placed the relic of some saint.

It is interesting to note that in taking down the partition wall between nave and chancel, the architect found in it, used as rubble, many of the sculptured and moulded stones of the chancel arch. He has thus been able to reconstruct it on paper according to the original design; he has also been fortunate in finding the original place from which the arch sprung; and of its reconstruction a lady has generously offered to bear the entire cost.

Touching the tower, it may only be noted that in the belfry are three bells—one, dedicated to Mary, having been specially cast for the town in 1490, as is set forth on the legend upon it; and that originally the four spirlets at the angles of the battlemented wall head enclosed an Imperial stone crown, which seems to have been taken down early in this century, from the fear that the tower had become too frail to carry its weight. The old engravings of the tower are not all agreed as to the exact form or height which this crown assumed; but one or two of them are of elegant design, and if sufficient money is got the rebuilding of the crown might be considered as part of the restoration scheme.

The restoration of a church so interesting architecturally, and with such a long and varied history, is a work which certainly should be taken part in by the nation at large, and it may again be hoped that the funds will be forthcoming for the purpose.

The officials of the committee in charge of the restoration are Mr. W. H. Henderson, Nether Parkley, chairman of the general committee; Mr. Alexander Turnbull, Hillside, general secretary; Mr. W. Gilkison, British Linen Bank, Linlithgow, treasurer; and the Rev. John Ferguson, The Manse, Linlithgow. The chairman of the executive committee is Mr. Miller Richards of Clarindon, and the secretary Mr. M. W. Henderson.

SURVEYORS' FEES.

AT the Hampshire Assizes the action, Morgan & Endle v. W. B. Hill, was tried before Mr. Justice Wright. Counsel for plaintiffs stated that the defendant was an auctioneer and surveyor, of Southampton, and the action was brought for a sum of money received by him as the proceeds of an auction which he held for the plaintiffs. The defence raised several matters as to which the parties were at variance. It was admitted that the defendant had received a certain sum. Practically, he did not think there was any dispute that the gross sum received had been, as stated by the plaintiffs, 387*l.*, and the defendant had paid into court the sum of 170*l.* and pleaded a set-off and counter-claim as to the rest. In the counter-claim charges were made against the defendant by the plaintiffs as auctioneer and surveyor. The first item he claimed was the sum of 115*l.* 9*s.* 11*d.* for work and labour done and money paid for the plaintiffs. That was the chief item as to which dispute arose, and it occurred in this way. The plaintiffs having acquired a property called Berrywood, near Millbrook Station, they employed the defendant as surveyor, and asked him on what terms he would lay out the property as a building estate, and to lay out the roads. Mr. Hill was also to act as surveyor to the estate, but at that time no work was involved, as there was nothing to do. It was understood Mr. Hill was to act for the estate, and the main thing to do was to set out a plan for the roads, and obtain tenders for making the same. According to the plaintiffs, it was agreed that he should do that on a commission on the amount of the cost of the road—the money expended—and that was to be an inclusive charge. Mr. Hill commenced the work, and submitted specifications, while he also advertised for tenders. The tenders received were not satisfactory, and Messrs. Morgan & Endle stipulated with Mr. Hill that they were not to be bound to accept the lowest or any tender, as they had their own idea of what the work ought to cost. The lowest tender they received was a great deal more than they expected, therefore they did not accept it. Thereupon, some reduction was made by Mr. Hill in the specification, and tenders were again invited, but they were still unsatisfactory. Messrs. Morgan & Endle stated that they would not have the work done at the price, and wished Mr. Hill to obtain further tenders, about which there would be no difference, because Messrs.

Morgan & Endle obtained a tender, and got the work done at a lower sum. Mr. Hill said it was improper and unprofessional to again invite tenders after the amounts had been published, and he would have nothing more to do with the matter, and he did not. There were certain charges made by the defendant in respect to perusing draft agreement, which could not be sustained, as the defendant was not a solicitor, and another item for consulting Messrs. Green & Moberly could not be sustained. It was contemplated that the land should be laid out as a building estate, and Mr. Hill was introduced by one of the plaintiffs to a gentleman named Wilson, who intended to take up the ground and build on it. For Mr. Wilson the defendant did certain work, but the charge had been made out to the plaintiffs, though the work would only benefit Mr. Wilson, who would be prepared to pay. This sum amounted to 30% out of 115%. The other charges were mainly for doing the work for which the plaintiffs said the defendant was to take commission of 5 per cent. on the cost of the road, and which they said had become totally useless in consequence of the defendant withdrawing from the work because they would not accept the tender he wished. The amount of the first tender was 621%, and the roads were ultimately completed at a cost of 380%, and the most the defendant would be entitled to would be 5 per cent. on that, about 19%, which must supersede the whole of the charges the defendant had made. Then there was an item for 25% 7s. 6d. for timber allowed to be taken away from the estate by a man named Score, without being paid for.

The plaintiff stated that in October last year he and his partner acquired Berrywood, and consulted Mr. Hill with respect to laying it out for building purposes.

In cross-examination the witness stated that Mr. Hill did not introduce the plaintiffs to Messrs. Green & Moberly to get them an advance, as they had the money ready. Messrs. Green & Moberly did advance them a loan after they had seen Mr. Hill. The roads had been done by another surveyor, who had put into his hands Mr. Hill's plan. The loan was obtained from Messrs. Green & Moberly to finance the builders on the estate.

Mr. Henry Wilson, a builder, of Bournemouth, stated that he employed Mr. Hill with respect to some houses he built, but Mr. Hill had not sent in his bill.

Mr. Hill, the defendant, said he had laid out scores of estates, and was surveyor to Queen's College, Oxford. He received instructions to sell the house on the estate and the old material, the amount realised by the sale being 382%. Of that amount 43% was bought in by Messrs. Crook & Batten, who afterwards refused to complete the purchase, and that was allowed. With regard to the timber sold to Score, witness refused to allow it to be removed until it was paid for. It was, however, taken away, and witness had not been paid. The amount in all not paid was 71% 15s. Afterwards he had an interview with plaintiffs with respect to laying out the estate. Witness went through the various items, saying he was to have 5 per cent. commission on the making of the road, and the usual other charges. He took his instructions with respect to what was done for Mr. Wilson from Mr. Morgan, though he knew Mr. Wilson was concerned, but he should never think of charging Mr. Wilson. He tendered a cheque for 154% 9s. 7d. to the plaintiffs, and after being kept some time it was returned to him endorsed. Afterwards he tendered 170% in bank notes, which was not accepted, and this sum had been paid into court.

Mr. W. H. Mitchell, architect and surveyor, was called to speak as to the reasonable nature of the charges made, but

His Lordship said all the surveyors in the Kingdom could be called to uphold the charges.

Mr. Burrough Hill, jun., having given evidence to show that the work alleged to be done to the order of Mr. Wilson was by the instructions of Mr. Morgan,

His Lordship stated that there were several different points he should have to submit to the jury, but it was agreed by the counsel on both sides that the case should be settled by the judge, and the jury were discharged.

Mr. Bullen, for defendant, stated that the amount due to the plaintiffs was 15% less than the sum paid into court.

His Lordship generally summed up in favour of Mr. Hill, but struck out one or two items, and reduced others, giving judgment for 52% beyond the amount paid into court, and apportioned the costs.

ARCHITECTS AND DRAINAGE.

IN the Worcester County Court, before Sir R. Harrington, judge, Mr. B. W. Locke sued Messrs. Henry Rowe & Sons, architects, for 12% damages for expense and inconvenience caused by reason of defendants' alleged negligence as architects in the superintendence of the erection of a dwelling-house at Hallow, whereby a drain was laid in such a manner as to prevent proper drainage, in consequence of which the plaintiff was put to the extra expense of 6% 2s. 6d. for having the drain relaid, and also 4% 9s. for doctor's bills for attending members of plaintiff's family, who were suffering from fever caused by the defective drains.

Plaintiff said that in 1890 he contemplated building a house at Hallow, and instructed Messrs. Rowe & Sons to prepare specifications and to carry out the work. The specifications contained provision for laying drains. The work was certified for by Messrs. Rowe & Sons, whose bill of 13% 8s. he paid, and also the contractors' bill. He went to live in the house on August Bank Holiday, 1892, and in a few months found the cellar shoe deep in clear water. It continually flooded the cellar and subsided. In May, 1893, soapsuds and other offensive fluid collected in the cellar, and three weeks later he had the drains taken up. His children were twice attacked with scarlet fever, at an interval of about twelve months, the water in the cellar smelling very badly. Mr. Polson's bill for attendance amounted to 4% 9s. He had the drain taken up, and found that the connection with the culvert was laid so that it would meet the flush instead of going in the same direction with it. Since the relaying of the pipes he had had no cause of complaint.

In cross-examination plaintiff said three months were allowed to elapse after he went into the house and before the final payment was made to the contractor in order to see that the work was satisfactorily done.

In reply to his honour plaintiff said that he bought the house through an advance of a building society, who, however, did not have anything to do with the plans.

A labourer said that on uncovering the pipe he found the end "cocked up" into the culvert. The pipe was choked up with mud and black water. Corroborative evidence having been given,

For the defence it was pointed out that almost three years elapsed before the architects had any notice of defects in the drain. It was unreasonable to suppose that an architect if he did his duty—as he submitted Messrs. Rowe & Sons had done theirs—should be held responsible for any defect that might arise at that period of time. Counsel was proceeding to speak of the illness of the children, when his Honour remarked that there was no evidence that their illness was due to the drains. Counsel urged that what stopped the pipe was not matter from the culvert, but was due to Mr. Locke's lack of proper attention and flushing of the pipe. Messrs. Rowe would, if they had thought they were in the wrong, have compensated Mr. Locke, but they denied that they were, and desired to vindicate their reputation.

Mr. A. B. Rowe, of the defendant firm, said that when the excavations were being made a spring was met in the cellar, and the drainage-pipe had to be lowered some 4 feet. The pipe was 90 yards long and had a fall of 20 inches. He and his assistants visited the house several times during its erection, and no complaint was received within three months of the erection. The pipe was sufficient to carry down the surface and scullery water. He had nothing to do with the connection of a stable drain from the premises of Mr. Lord—through whose orchard plaintiff's pipe was carried—to Mr. Locke's. The pipe ought to have been flushed frequently, or matter would accumulate in it.

Corroborative evidence having been given, the Judge pointed out that the architects' duty in this case was to exercise a general superintendence, and not discharge the function of a clerk of works, who had to continually check the work of those under him. There was no evidence connecting the illness of the plaintiff's family with the drain—the illness (scarlet fever) might be aggravated by a bad drain, but must be communicated. If they thought that the advice given by Mr. Rowe was not unskilful, then they would return a verdict for the defendants; on the other hand, if they thought plaintiff was entitled to damages the 6% 2s. 6d. seemed a fair sum.

After considering the evidence for about half an hour, the jury stated that they were unable to agree. The Judge asked whether the parties were prepared to take the verdict of the majority. Eventually it was agreed to take the judge's decision, which would be given at a later period.

A SCIENTIFIC LABORATORY.

THE monthly general meeting of the Royal Institution, held on Monday, had the agreeable duty, says the *Times*, of confirming the acceptance by the managers of the offer by Mr. Ludwig Mond of one of the most munificent endowments of scientific research that has ever sprung, in this country at all events, from the liberality of a private citizen.

Mr. Mond last year bought the large freehold house, No. 20 Albemarle Street, contiguous to the buildings of the Royal Institution, and formerly the residence of the Earl of Albemarle. This house he has resolved to convey in fee simple to the Royal Institution. He further proposes to defray the whole expense of converting it from its present uses into a laboratory of chemical and physical research, to be called the Davy-Faraday Research Laboratory, and of equipping it with everything needful for the conducting of scientific research upon a large scale. In addition to this he proposes to endow

the new laboratory first with an income sufficient to defray all the expenses of rates, taxes and maintenance; and, secondly, with a further and of course much larger income, sufficient to pay the salaries and incidental expenses of a trained scientific staff, and generally to carry on the work of an institution of this kind in an adequate and business-like manner.

By this generous offer, the financial magnitude of which will be appreciated by all who are conversant with the necessities of a scientific establishment on so large a scale, Mr. Mond realises an idea which engaged the attention of Faraday and Brande and the managers of the Royal Institution half a century ago. In the year 1843 a proposal was made to establish at the Royal Institution a school of practical chemistry, which was not only to give practical and systematic instruction to students, but was also to provide a place where original researches could be conducted by individuals skilled in manipulation, and where the professors could work out their problems by the aid of many qualified hands.

This proposal was submitted by the managers of the Royal Institution to Professors Faraday and Brande, who expressed their strong approval of the end proposed and their desire that it might be carried out at the Royal Institution "if it could be done well." But on a closer examination of the limited space within the walls of the Institution it appeared impracticable to afford accommodation for carrying out the proposed scheme.

In 1846 the Royal College of Chemistry was founded, and since that time numerous schools for the teaching of practical chemistry have been established all over the country. These, however, only cope with the first part of the scheme recommended in 1843, while as to the second part—viz. founding a laboratory for the carrying out of independent and systematic researches—no adequate provision exists in England.

Mr. Mond has felt that the need for such a laboratory has become greater and greater since the work of the scientific investigator has become more and more subtle and exact, and in consequence requires instruments of precision and a variety of facilities which a private laboratory can very rarely command. It has been his desire for many years to found a public laboratory which shall give to the devotees of pure science, anxious and willing to follow in the footsteps of the illustrious men who have built up the proud edifice of modern science, the facilities necessary for research in chemistry, and more particularly in that branch of the science called physical chemistry. He has come to the same conclusion as the promoters of the scheme of 1843, viz. that such a laboratory would still have the greatest prospect of success under the ægis of the Royal Institution; that, in fact, it would be the consummation of the work which this great Institution has been fostering in its own laboratory with such remarkable results by the aid of the eminent men whose services it has always been fortunate enough to procure.

He accordingly places the Davy-Faraday Laboratory under the management of a committee, nominated by the managers of the Royal Institution from among themselves and reporting to them. While the laboratory will have a competent chief of its own, devoting all his time to its work, Mr. Mond desires that the resident professor at the Royal Institution should accept the position of director, thus further strengthening the ties between the Royal Institution and the laboratory as well as insuring for the latter all the aid it is in the power of the Royal Institution to afford.

The laboratory is to be free to all persons, without distinction of sex or nationality who, in the opinion of the managers of the Royal Institution, are fully qualified to undertake scientific investigation, preference being naturally given to those who have actually done original work.

After providing for all the needs of the Davy-Faraday Research Laboratory, the house given by Mr. Mond to the Royal Institution will afford space sufficient to provide a considerable addition to the accommodation of the Royal Institution itself. Such an extension of its premises is particularly needed to make room for its growing library and also for the chemical laboratory, where the powerful apparatus required for such investigations as those so brilliantly carried on by Professor Dewar demand space undreamed of by the chemists of an earlier generation.

Having thus at once added greatly to the resources of the Royal Institution itself and made provision for a laboratory of research free to all competent investigators from the outside, Mr. Mond hopes that others may come forward to take the further step of founding scholarships and bursaries for the benefit of promising students who may not possess the means to avail themselves of the great opportunities now offered. If liberality as modest as it is magnificent—for it will be noted that Mr. Mond does not even attach his name to this splendid foundation—can avail to stimulate the generosity of those to whom science has been a bountiful foster-mother, the laboratory now founded will become the most appropriate of conceivable memorials to the great chemists from whom it takes its name; while the Royal Institution, where they laid the foundations of knowledge to which this country owes an incalculable addition

to its prosperity, will enter upon the second century of its existence with the brightest prospects of redoubled vitality and usefulness.

HORNSEY LOCAL BOARD.

THE following resolution was unanimously passed at the meeting just held: "That the board in accepting the resignation of Mr. Thomas de Courcy Meade, M.I.C.E., on his appointment as city surveyor of Manchester, desire to place on record that he has been in their service as engineer and surveyor for more than thirteen years (having previously been their assistant surveyor for a few months), and that during the period for which he has held that position he has conducted the business of his office not only with the most scrupulous fidelity but with great ability and credit to himself, and with undoubted advantage to the whole of the district under the jurisdiction of the Hornsey Local Board, the improvement in the sanitary condition of which is evidenced by the reduction of its death-rate in the last ten years from 13.6 per 1,000 inhabitants to 11.33, notwithstanding its immense growth and development. During that time he has carried out many engineering and architectural works of considerable importance, and these, with the making up of many miles of roads and works of sewerage, are represented by an expenditure of about half a million of money. The board in parting with Mr. Meade wish him every prosperity in his new and honourable position of chief surveyor to the Corporation of the City of Manchester." All who know Mr. de Courcy Meade will join in wishing him prosperity.

CARDIFF NATURALISTS' SOCIETY.

THE members of the Cardiff Naturalists' Society have just held their annual "field day," to which ladies were invited, a visit being paid to the Golden Valley, one of the most beautiful stretches of country in Herefordshire, lying between Pontrilas and Hay. A large number—little short of 100—left by the 9.30 train, and after visiting Clifford, Peterchurch and Vowchurch, and having lunched at Hay, reached Abby Dore late in the afternoon. A visit was paid to the remarkable church there, which was described by the vicar, the Rev. A. Phillips, and after this the annual meeting was held. The chief item of business was the election of president for the ensuing year, Mr. R. W. Atkinson, B.S.C., being unanimously chosen to fill the office. The party then proceeded to Pontrilas for tea. During the meal Canon Thompson made an eloquent appeal for assistance for the archaeological section to continue their researches at the Ely racecourse, where a Roman villa has been discovered. Mr. Edwin Seward, the president, Mr. T. H. Thomas, and Mr. W. Cook, the hon. secretary, each enforced the value and importance of the work which had been undertaken. It was announced that Mrs. Vaughan, of the Deanery, Llandaff, had subscribed 10s., and a large subscription list was at once filled up. The Society returned to Cardiff at ten o'clock, after a most enjoyable day.

GENERAL.

Mr. Ralph Nevill, F.S.A., of 89 Chancery Lane, has been appointed architect for the new church of All Saints, Norfolk Square, that is to replace the one recently destroyed by fire.

The Trustees of the National Gallery bought at the sale of the Adrian Hope Collection on Saturday *A View in Haarlem*, by Gerrit Barkheyden, for 450 guineas, and *A Scene on a Terrace*, by Jan Steen, for 780 guineas.

Ledbury Church, Herefordshire, is to be restored if 5,000s. can be raised. About 3,000s. has been collected. Many of the windows are in so dangerous a state that the loss of the beautiful tracery is imminent.

The Duke of York on Tuesday laid the memorial stone of the Cripplegate Foundation Institute, containing a reading-room, news-room, &c., on the west side of Golden Lane. The building is to be erected from designs by Mr. Sidney R. J. Smith.

A Study for "The Old Gate," by the late Frederick Walker, A.R.A., has been purchased for the Corporation Gallery, Birmingham.

Herr Georg Ebers, the Egyptologist and novelist, has invited men of culture in all lands to unite with him in a protest against the contemplated destruction of the temples on the island of Philæ.

The Award of Mr. Philip E. Pilditch, the arbitrator in the case of O'Brien v. Metcalfe, relative to the dilapidations accrued at Aston House, Stevenage, in which the surveyors engaged on either side were Messrs. Walton & Lee and Mr. Charles E. Sayer, has just been published, the amount of award being 547l. 7s.

The late Mr. John Scott, of Hunslet, has, it is announced, left 10,000s. for the erection of almshouses in Leeds.

The Architect.

THE WEEK.

THE Governors of Christ's Hospital may well be trusted to make the best arrangements for the prosperity of the institution. They have had a difficult task during the past few years. For that reason we consider the promoters of the meeting which was held on Wednesday at the Mansion House were rather impolitic in their endeavours to compel the Governors to announce the details of their contemplated measures. It is not likely that English men of business would purchase eleven hundred acres at Horsham if they were not in a position to utilise the ground. We do not give unreserved approval to the choice of such a site, for if the buildings are to be safe it will be necessary to lay out a larger sum on concrete foundations than has been anticipated. The land was not a profitable farm for the dairy company, and unless costly precautions are taken it may not be the most eligible of building sites that are obtainable about London. But that the Governors did not realise what was before them we cannot believe. Then, again, it must have been anticipated that the schools would need the expenditure of a large sum of money before they were erected, and it may be assumed that the Governors have provided for the emergency. The tact shown in meeting the objections which were raised on account of the unsanitary condition of the buildings in Newgate Street is evidence of the skill acquired in commercial affairs. To say that "information is wanting as to the source from whence the funds are to come to provide expensive new school buildings, but the Governing Body will naturally feel hesitation about embarking on this expenditure on the subject" is a platitude which is not worthy of Sir SYDNEY WATERLOW and the other requisitionists. It would be better if they proposed to raise money to extend the operations of the Governing Body. The speakers, however, were what are often called Job's comforters. Bankruptcy and ruin is predicted by those adverse to the change, and the meeting endorsed the resolution that the proposed new schools should not be proceeded with.

THE annual meeting of the subscribers to the British School at Athens was held on Wednesday at 22 Albemarle Street, Mr. BRYCE, M.P., in the chair. The names of distinguished personages present make a long list, and it may be mentioned that Mr. F. C. PENROSE, F.R.I.B.A., attended. An impression that forces itself once again on our mind is the paltry support given to art by this country, whether by individuals or by the State. It can scarcely be denied that a very limited view is taken of what art is. Art as understood in this country means, broadly speaking, the production of pictures. Until a more enlightened view is taken it is hopeless to expect the public or the State to spend money except in the purchase of pictures. Our space this week will not allow of entering into details, but the position of our British School of Archaeology in regard to financial support is in strange contrast to the aid so generously given by other nations and empires to their schools in Athens. It is creditable that private enterprise has enabled so much to be done by the kind and liberal subscriptions of the few.

A CASE was recently brought before the Sheriff's Court in Inverness in which a contractor claimed 15% from a local artist for preparing plans and specifications of a cottage villa. The defence was that the specification was so imperfect it was no guidance to the builders, and that in any event the sum charged was excessive, as 5% would be a reasonable sum. The Sheriff found that in the absence of a special agreement, reasonable compensation should be given, and he assessed the amount at 8% 8s. with costs. In laying down the law the judge said:—"Generally, architects are paid by a commission of so much per cent. on the outlay, and the Institute of British Architects have issued a set of rules dealing with professional charges, but these rules have no binding effect in law unless they are made part of an agreement between the

architect and his employer. In the present case, there was no express agreement between the parties as to remuneration, and the rules of the Institute were apparently not known to the defendant. They certainly were not referred to by the plaintiff in any of his interviews with the defendants. Notwithstanding the adverse criticism of some of the defendant's witnesses, I think it has been proved that the plaintiff's plans were good, and quite sufficient to enable the contractors to carry out the work contemplated."

THE destruction of the Brussels music-hall called the Palais d'Été on Wednesday morning should serve as a warning to municipal authorities in England. In Brussels, as in most continental cities, the theatres are closed in July, and pleasure-seekers in consequence are driven to music-halls, which they avoid at other times. The Palais d'Été might be considered as part of the Brussels Markets, or Halles Centrales, but it was none the less flimsy on that account. The flames were first perceived at 3 30 A.M., and in an incredibly brief time the whole building was a ruin. In fact, the few firemen who were able to reach the street were in great danger from the falling materials. Beneath the hall was the freezing chamber of the city, but cold air could have no effect on the fire. The water supply was also deficient. Brussels is supposed to be a well-built city, and in no place could fireproof construction be attained on more economical terms. Yet in an important quarter of the city it is found that a sort of public building could not withstand a fire for a single hour. If the accident had occurred five hours earlier the loss of life would have been appalling. Building committees in London and English towns should not forget what has taken place in Brussels, and it is their duty to insist that all music-halls are rendered sufficiently secure at least for as long a time as is required to allow an audience to depart in safety.

THE Belgian Government has declined to authorise the commune of Schaerbeek, one of the suburbs of Brussels, to raise the money that is necessary for the erection of the proposed hospital. Fortunately one of the residents of the commune, M. CAROLY, has come forward and has undertaken to defray all the expenses. His first donation is 20,000%, but of course that will be only a fraction of what will be needed. In consequence of his liberality the hospital will bear his name. The works will be started immediately. The site is excellent, between the highways of Haecht and Helmet.

WHEN it was first proposed to set up one of the ordinary Munich windows in the hall of the Stationers' Company we protested against the proposal, for an ancient Company should not set the example of going abroad for work which could be easily obtained in England. It may be wrong, perhaps, to put the case in that way, for the commonest English stained-glass reveals aspirations which are not found in the mechanical products of German manufacturers. But the latter are liberal to an excess in providing strong colours, and it is to be feared that the Worshipful Company of Stationers are no more able to resist their influence than the African races. That men who have a sort of commercial connection with literature should be in that condition may seem to be deplorable, but it should be remembered that printers and publishers are rarely acquainted with the works which bear their names. That the Lord Mayor should have unveiled a foreign window is to be regretted, for it would be better if he did not allow his loyalty as a member to gain the upper hand. The Chief Magistrate of London ought to utilise the strength of his official position for the encouragement of English art and industry.

THE French Minister of Public Instruction has given a commission to M. BOUCHER, the sculptor, to prepare a bust of the new President of the Republic, M. CASIMIR-PERIER. The work will become the property of the Administration des Beaux-Arts, and will be reproduced in porcelain at Sèvres. The copies will be distributed, in order that they may be placed in the public and municipal offices throughout France.

IS GOTHIC ARCHITECTURE A FAILURE?—II.

[BY A CORRESPONDENT.]

IN Gothic buildings the addition of a label over a single-light window, or one of several lights divided by mullions, is, of course, not only architecturally effective, but is in a place where it suggests most protection from rain. In Classic work, although an architrave to some extent serves the same object, it does not project so much, and it is believed there are no examples of it being stopped in the same place as the label is in Mediæval buildings, *i.e.* by a head, mask, knot of foliage, or other ornamental termination; for the architrave is either continued down the jambs or stops on a continuous horizontal member, or on a capital. In Classic architecture a pediment to some degree supplies the place of the Gothic hood-mould or label, but of necessity in a much more elaborate and costly way. The very common practice of "scooping out" the apex of the pediment and sticking in a bust, vase or other ornament, entirely does away with the *raison d'être* of the pediment, and can only be defended on the ground of its looking "picturesque," which to the writer appears absurd. However, this innovation is of very old standing; so it is supposed that people have forgotten that it is not found in the more ancient Classic examples. The Mediæval label was, for obvious reasons, never mutilated like the pediment so often is. If the architect were more careful to suggest a meaning to his details such things would not happen. To insist dogmatically on every feature to the exterior of a building being so designed as best to withstand the assaults of the weather would be manifest folly. But it is well to think of practical matters where architectural effect is not thereby injured. In English thirteenth-century work the mouldings are frequently much undercut. Now, in the case of a circular or vesica-shaped form of opening, placed at a height considerably above the eye, where it could not be looked down upon, except from a balloon or by means of a ladder, such hollows would only collect water, and by the action of frost speedily tend towards the destruction of the contiguous mouldings and masonry. This was foreseen by our Mediæval forefathers, and the hollows were omitted when they ceased to be visible from down below, while the stone was worked so as to throw off the rain-water instead of retaining it. The writer is speaking not "without book," as he found this precaution taken in the case of a great church, where scaffolding had been put up for the purpose of general reparation to the fabric. But "*Retournons-nous à nos moutons*," or in other words the consideration of the mullion question. Its origin is most probably to be found in ecclesiastical architecture rather than in secular or domestic buildings, to which, however, it was rapidly appropriated owing to its convenience. As is well known, it was the mullion which undoubtedly prompted the invention of window tracery. It was too useful a feature not to be laid hold of by the Renaissance architects, and in the Châteaux on the Loire and elsewhere mullions were transformed into something like miniature pilasters with excellent effect.

It would be quite impossible, when discussing the subject "*Is Gothic Architecture a Failure?*" to avoid alluding, in passing, to the two certainly most important modern secular buildings in the Metropolis—the Houses of Parliament and the New Law Courts. The merits and demerits of the former have been abundantly and exhaustively criticised since the magnificent pile was first erected. So it would be superfluous to again go over such well-trodden ground. The talented architect of the latter was so comparatively recently taken away from us that the writer (who had the great privilege of some personal acquaintance with him) thinks it better not to discuss its qualities. Its designer, as is well known, was beset with unusual difficulties in his gigantic task. The remarks sometimes made by some of the legal profession and by the public at large are therefore unreasonable. The architect cannot be said to have had quite fair play in rendering the Law Courts a specimen of what a fine secular Gothic building ought to be. Sir CHARLES BARRY does not appear to have been hampered in the same way in the case of the Palace at Westminster.

The very masterly way in which Sir CHRISTOPHER

WREN contrived to get some approach to the skyline of a Gothic spire, and a general pyramidal contour when that style was at a discount, cannot but excite admiration in the mind of the most rigid Mediæval purist. For WREN showed true inventiveness and also a spirit of adaptation in employing and rearranging Italian detail, which is far better than to have attempted the impossible, and simply classicised a Gothic framework. He was also ably followed by his pupils, to whom London is indebted for some beautiful examples of Renaissance spires. But the origin of this most pleasing feature in our Mediæval churches was almost lost sight of, owing to the manner in which storey upon storey in these Classic structures was piled up. For looking at the most elaborate and latest examples of spires during the Gothic period, the *motif* of a prolongation of the original pyramidal roof to the tower, greatly altered it is true, is still very apparent to those who seek for it. In some of the village churches in the neighbourhood of Caen the sudden jump from the wood pyramid to that carried out in stone is very noticeable. The latter, unadorned, must of necessity have a crude and heavy appearance. But the English manner of throwing squinches across the angles of the tower and arriving at an octagonal plan in preparation for the spire, gracefully forming the outward junction of the two by means of a broach or other appropriate means, is far happier. Of course, later on, the French spires soon acquired a graceful outline, as it is only in the early stage that these low plain stone pyramids are found. WREN and his school have left to us in their spires essentially English and original compositions, owing to the able manner in which the various features of Renaissance work were welded together. But their utmost efforts unquestionably left the older type the better, because that was founded on the right principle of spire growth that is observable, as has been pointed out, from the earliest to the latest examples. As a rule a horizontal slice through a Gothic spire, and lifting the upper part off, would result in its hopeless mutilation. But that would not really be so ruinous a process in some of those of the Wrenian character. This shows an element of weakness in their design, and a departure from the ideal of which a spire should be.

When the power of the Roman, and then Greek, styles of architecture, as practised in this country, had been shaken, and the absurdity of gloomy porticoes from ground-line to cornice, as well as of the low-pitched or almost invisible roofs had been at last brought home to the public, the gables and high-pitched roofs of Mediæval times, so suitable to our climate, were re-introduced. Notwithstanding the revival of Classic architecture shown in the buildings of François Premier of France and in our Elizabethan period, the lofty roofs were sensibly retained, and, in fact, in the Châteaux on the Loire made even more of by utilising them for rooms, and forming charming features owing to the way in which dormer windows of picturesque design were introduced. Our street architecture has greatly benefited by this enlargement of the use of the Mediæval high-pitched roof, which has done more towards abolishing the monotony of London streets than almost any other feature, consequent on the variety given to what was formerly a nearly dead level of skyline.

There is a structural feature, often very important, that is essentially a Gothic invention, *viz.* the buttress, which in its true character did not exist in Classic times. For it was then used as a pilaster, and therefore had little projection or real ability for substantial work. As walls were then of such ample thickness at a period when labour and materials were cheap, while time was not such an object as at the present day, the want of buttresses could not have been so appreciably felt. In some very early Mediæval buttresses, such as at St. Remi, Rheims, and at St. Peter's Church, Northampton, semicircular projections attached to the walls externally were the forerunners of what afterwards became the regular buttress. This was probably at the onset suggested by the Classic engaged column. In Norman and Early English work the same idea, somewhat modified, appears in the nook-shafts at the angles of buttresses. In secular and domestic architecture this feature is in many cases not required. But when employed and treated with due judgment it has telling effect. One does not necessarily look for ornamentation in a buttress, for its *raison d'être* makes it require good width and projection, and these

features in themselves, with the use of well-designed water-tables, inserted at the proper places, form decorative adjuncts. There are, it need scarcely be said, buttresses *and* buttresses. Some absolutely injure the effect of the buildings to which they are attached owing to the clumsy manner, artistically speaking, in which they have been treated. It is a task for the modern Free Renaissance architect to devise a way of grafting a useful as well as effective buttress on to his building, where really wanted, without attempting to Gothicise it. When the bright sunlight strikes on a long flat front of wall, destitute of any substantial projection, the addition of a buttress supplies something very desirable. In many of the picturesque churches in Surrey, Sussex and other counties, however, where freestone was scarce but abundance of flints to be had, the builders of the Middle Ages judiciously dispensed with buttresses, owing to the expense and difficulty of procuring proper quoins for the angles. The ordinary local materials being cheap and handy, the necessary amount of stability was obtained by very thick walls. This was a sensible proceeding on the part of those who reared these churches, wiser men in this respect than some of their successors. Where the buttress fulfils a proper constructional function, it is to be heartily welcomed as a valuable artistic help to the exterior.

There can scarcely be a prouder architectural distinction to this country than the development of the abacus, &c. (the crowning member of the capital) during the early period of the growth of the Gothic styles. The inconvenience often caused by the square plan of this moulding was at first tentatively got over by splaying off the angles to a small extent at 45 degrees, so as to form an irregular octagon. But this slight modification speedily failed to satisfy the aspirations of the seekers after expansion from hard-and-fast lines. So a bold leap was taken and the circular abacus adopted, which plan the mouldings of the capital, and also of the carving, when employed, followed. At Wells Cathedral the history of the progress of this most important innovation is well shown—the earlier form in the capitals of the nave arcade and that which succeeded it in the exterior of the great west front. Such a departure necessarily affected the plan of the arch mouldings, and produced that novel and immense variety in its members in which the thirteenth century revels, oftentimes with an exuberance that not only might well have been spared, but which would have resulted in better effect had rather more restraint been exercised. It was, in fact, a case of a good thing overdone. As an Englishman with considerable knowledge of our native architecture—as one, too, who has studied French, German, Belgian, Dutch, Swiss, Italian, and Spanish work in their own countries—the writer has never seen anything to equal the treatment of thirteenth-century mouldings, where they have been designed in proper groups and on a well-considered principle.

(To be continued.)

PRESERVATION OF CITY CHURCHES.

THE Lord Mayor presided at the public meeting held at the Mansion House to promote the objects of the City Church Preservation Society. Dr. Edwin Freshfield proposed a resolution to the effect that the meeting, while favourable to a much-needed reform in the ecclesiastical arrangements of the City, was of opinion that any further destruction of churches and desecration of sites was to be deplored, and must be strenuously resisted. Professor Shuttleworth seconded the resolution, maintaining that the City churches were absolutely unique in the ecclesiastical architecture of Europe—he might say of the world—and he opposed the removal of the City churches on antiquarian, architectural and archaeological grounds. It was sometimes said that the City churches were of no use. He did not believe one word of it, but if there were any that were useless they must be made useful. Mr. Lefevre and Captain Baker proposed to insert, after the word “deplored,” the words “except in connection with City and sanitary improvements,” but the suggested addition fell through, and the motion was then adopted. Mr. Neave Hill afterwards proposed a resolution expressing regret at the attempt now being made to bring about the destruction of the church of St. Ethelburga, in view of its great historical interest and practical value. Mr. H. C. Richards, in seconding the motion, observed that if, as some contended, City churches were to be removed because at the present time they had no congregations, St. Paul’s Cathedral ought to have been removed thirty-

five years ago. A gentleman had informed him that on a Christmas Day in the sixties he was one of two communicants there, but they all knew what St. Paul’s Cathedral was to-day. The resolution was carried.

The Bishop of Winchester and Dean Kitchin have put forth a proposal for the conversion of Wolvesey Palace, Winchester, into a diocesan church-house. The palace lies close to the river Itchen, between Winchester College and the deanery gardens, and for some years was hired by the authorities of Winchester College for educational purposes. Two years ago the Bishop was desirous of selling the palace to the governing body of Winchester College, intending out of the proceeds to purchase or hire a residence in the cathedral city, but the Ecclesiastical Commissioners did not see their way to alienate from the custody of the see a property of such historic interest.

FUNCTIONS OF THE ART UNION OF LONDON.

THIS Society, who contended that they were not liable to be assessed for local rates, and who had judgment given against them in the Divisional Court when the case came before Mr. Justice Wright and Mr. Justice Collins, have carried their case to the Court of Appeal, and on Monday the Master of the Rolls and Lord Justice Kay decided in favour of the Society, Lord Justice A. L. Smith dissenting. In giving judgment, the Master of the Rolls said that it was contended that, from the manner in which the Society had exercised its powers, it was not a Society instituted for the purposes of the advancement of the fine arts exclusively. That drove them to consider what it was that this Society had done, and what was its constitution and usage. That it was a Society for the advancement of art could hardly be denied, and, moreover, the Society had obtained the certificate to that effect from the barrister which the Act required. But the authorities showed that in questions of rating the Court were not bound by the certificate so given. Therefore they had to examine the matter for themselves. The Society was constituted to take cognisance of works of art in painting, and to do what it could to promote that art. The way in which it did it was to select one of the best pictures of the year from one of the various exhibitions and purchase it. It did not sell the picture, but had it engraved and had a sufficient number of copies taken to give each subscriber a copy. Then if the Society had money enough it allowed a subscriber, who was chosen by lot, to select a picture for himself of a certain value, and when selected the Society bought the picture from the artist and gave it to the subscriber. If the subscriber selected a picture above the limited value he would pay the extra sum out of his own pocket, but that consideration appeared to him (the Master of the Rolls) to be immaterial. In his opinion this was a Society instituted for the advancement of the fine arts exclusively. The Society must further be supported wholly or in part by annual “voluntary contributions.” What was the meaning of “voluntary” in this Act? The antithesis or voluntary was compulsory. In *Churchwardens of Birmingham v. Shaw* (10 Q.B. 868) the Court construed the word as being the antithesis of compulsory. Then what was the meaning of “contributions?” If a person bought a thing he did not contribute to it. Contribution was a payment towards some general object. If it was a payment for a thing purchased it was not a contribution. If the cases were examined in which the society had a reading-room or such like it would appear that there was a payment and not a contribution. Taking both words together, if the members paid the subscription voluntarily and continued to do so, though not bound to do so, it was a “voluntary contribution.” The members here were not bound to pay nor to continue paying, and when they paid they did not pay for any particular thing. They subscribed to support the Art Union, and if so, it was not a payment but a contribution, and a voluntary contribution. It might be said that the proper inference of fact was that the members who subscribed did so, not for the purpose of advancing art, but for the purpose of a gambling chance. But the Legislature had exempted the Society from the Lottery Acts. If the Legislature had thought the distributing the picture by chance had altered these societies into gambling societies it would never have legalised them. The Legislature must have been of opinion that it was not in reality a lottery, though coming within the strict words of the Lottery Act, but only a means of distributing a work of art. Speaking for himself, it was an untrue inference to draw that all the persons who subscribed to an art union did so for the purpose of purchasing a chance of getting a picture. They really and truly paid to support the Society for the advancement of art, and did not pay the money for the purchase of an article. The contributions were therefore in every sense contributions and not payments. They were voluntary contributions. The Society was therefore exempt, and the appeal must be allowed.

Lord Justice Kay read a judgment to the same effect.

Lord Justice A. L. Smith said the first question was whether the Art Union of London was instituted for the purposes of the fine arts exclusively. In *Commissioners of Inland Revenue v. Forrest* (15 App. Cas. 339), Lord Watson said:—"The society must be one instituted exclusively for the purpose of science, literature or the fine arts. . . . It is not sufficient compliance with the plain language of the Act that a society be established chiefly for the purpose of promoting science, literature or the fine arts. One or other of these must be its exclusive object; so that an institution which also contemplated some other, though altogether subsidiary, object, could not claim the benefit of the exemption." That meant that if the other object be an object distinct from and not connected with the fine arts, then the society had not as its exclusive object the promotion of the fine arts; but, if the other object be only a means to the one end—that is, as in this case, a lottery whereby to draw money from the public for the promotion of the fine arts—then the society had one sole and exclusive object, namely, the promotion of the fine arts, and not another subsidiary thereto. Upon consideration his lordship said that the right conclusion was that the object of the Art Union of London was the promotion of the fine arts exclusively, though, as incidental to that object, the lottery was brought into play and some painters and artists were benefited whose works happened to be appreciated. As regards the second question—whether the Society was supported wholly or in part by annual voluntary contributions—his lordship, after referring to the definition of voluntary contributions given in *Commissioners of Inland Revenue v. Forrest*, said that the words "annual voluntary contributions" must have some limitation placed upon them other than that of compulsory contributions. He would not attempt an exhaustive definition; but he would take the concrete case of the annual contributions to hospitals which were supported by voluntary contributions, and, in his opinion, these were the kind of contributions aimed at by the Act. If the payment was made to a society for value received or expected to be received—that is, that the object of the subscriber was to obtain material advantage to himself—then it was not a society supported wholly or in part by annual voluntary contributions so as to come within the exemption in the Act; but, if the contribution be made by way of gift from disinterested motives for the benefit of others, it did. All contributions to societies instituted for the purpose of science, literature, or the fine arts exclusively were made in one sense voluntarily, in that they were not made compulsorily. But this was not, in his opinion, the true reading of the Act. Some limitation must be placed upon the term "annual voluntary contributions," and the limitation seemed to him to be that above expressed. He could not bring himself to hold otherwise than that the object which prompted the subscribers to pay a guinea or more to the Art Union of London was the hope and expectation of gaining in the legalised lottery what every subscriber had an equal chance of obtaining, namely, a prize and the other material advantages attaching to the subscription. The subscriptions were not gifts made from disinterested motives for the benefit of others so as to be annual voluntary contributions within the meaning of the Act. That being so, the Art Union failed to prove the second requirement, and, in his opinion, the appeal should be dismissed.

THE NINEVEH SCULPTURES.

A FINE series of reproductions from some of the most notable sculptures contained in the Assyrian collection of the British Museum by Mr. Alfred Jarvis has been purchased for the Brighton Museum, to the collection at which they will form a most interesting addition. The series comprises statuettes of Sennacherib, Assurbanipal and his queen; figures of the well-known winged human-headed Lion and Bull, Nimrod's Head, a small lion weight, and the beautiful "Garden Scene." Though the history of the discovery of the monuments of Assyria, and the subsequent transfer from the long-buried palaces of Assyria's mighty kings to the galleries of the National Museum must be more or less familiar, Mr. H. Spencer has utilised the opportunity in the *Sussex Daily Post* to review the story of the excavations.

The bygone history of Nineveh is more or less involved, he says, in obscurity; but the great city was destroyed somewhere about 600 years before Christ. For many hundred years she had stood in all her arrogant splendour, glorying in pomp and power. But at last she fell. The doom foretold by the prophet Zephaniah (ii. 13-15) overtook her; and Layard tells us how the luxury and civilisation of a mighty nation have given place to the wretchedness and ignorance of a few half-barbarous tribes; and how the wealth of temples and riches of great cities have been succeeded by ruins and shapeless heaps of earth. For more than 2,000 years the city lay buried and its site unknown. Tradition pointed to the banks of the Tigris. There, it was supposed, she had stood in proud and solitary

grandeur, and the mounds, which had so often excited the wonder of travellers, were supposed to be her grave.

Mr. Rich, an Englishman, was the first to investigate the origin of these mounds, but with little success, and the few fragments of inscriptions, pottery, bricks, &c., which he collected were after his death placed in the British Museum. In the year 1842 M. Botta, the French Consul at Mosul, began to explore the mound locally known as Kouyunjik. His efforts were practically fruitless until one day a peasant, who happened to be watching the workmen, was considerably amused at the careful manner in which every fragment of brick or pottery was picked out and laid aside. He laughingly remarked that they might be better repaid for their trouble if they would try the mound on which his village was built, for lots of such rubbish had been turned up when the foundations of their houses were being dug. Following this hint, M. Botta shortly transferred his operations to Khorsabad, where he almost immediately discovered the palace of Sargon, King of Assyria. The greater part of the sculptures which he excavated were sent to Paris; a very few reached England. Encouraged by the success of M. Botta, Mr. (now Sir Henry) Layard determined to explore the mound of Nimrod, a step he had long contemplated. Quickly completing his arrangements, he quietly left Constantinople in the autumn of 1845, reaching Mosul some twelve days later. For various reasons it was deemed prudent to conceal the object of this journey. A few days later, having secretly procured some tools, Mr. Layard and Mr. Ross (a British merchant then residing at Mosul), together with a mason engaged at the moment of departure, announced that they were going to hunt wild boars, and floated down the Tigris on a raft, ostentatiously displaying a variety of guns, spears, and other weapons. By sunset the travellers reached the Awai, or dam across the river, and landing, walked to a small hamlet called Naifa, not far from the great mound, and here, in a miserable hovel inhabited by an Arab and his family, they passed the night. Before they rose next morning the Arab, whose services Layard had engaged overnight, had secured the help of a few more men from a neighbouring village, with implements and various things necessary for the work. Early in the morning operations were commenced at a point where a piece of alabaster appeared above the soil. This proved to be one of several slabs, the whole forming a square chamber, with one stone missing at the corner which was supposed to be the entrance.

Many and various were the difficulties with which Layard had to contend before he relinquished, in 1853, the noble task he had undertaken; but that first day's work was destined to be succeeded by the discovery of no fewer than seventy-one halls and chambers, the entrances to which were guarded by gigantic human-headed monsters, and the walls of which were lined with beautifully-sculptured bas-reliefs. Here on these slabs were portrayed, in a strikingly vivid manner, the habits and the customs of this powerful and warlike race; their battles, the sports of their great kings, and the sufferings of the captive tribes of Israel; while piled up in one of the chambers lay the wonderful library—truly noble monuments of the art and learning of a people who flourished 2,500 years ago. Mr. Layard gives a picturesque description of the last evening the disinterred sculptures were permitted to repose in their own land. "We rode," he says, "one calm, cloudless night to look at them for the last time before they forsook their ancient resting-places. The moon was at her full, and as we drew nigh to the edge of the deep wall of earth rising round them, her soft light was creeping over the stern features of the human heads, while the dark shadows still clothed the lion forms. One by one the gigantic limbs emerged from the gloom till the venerable figures stood all unveiled. A few hours more and they were to stand no longer where they had stood unscathed for ages amid the wreck of all man's other works. It seemed almost sacrilege to tear them from their old haunts—to make them a mere wonder-stock to the busy crowds of a new world. They were better suited to the desolation around them. They had guarded the palace in its glory, and they had watched in its tomb over its ruin." But on the day after this they floated down the Tigris, and after various breakages and vexatious delays, they at last found their way over the ocean to the British Museum.

Some of the finest examples of Assyrian sculpture, thus miraculously discovered, are included in the series of reproductions now obtained for the Museum of Brighton, and they should be highly appreciated for their associations, their truthfulness to the originals, and perhaps no less as examples of the delicate English porcelain (parian) in which they are made. The statuette of Sennacherib, who reigned B.C. 681-705, represents him clad in the robes of the dual office of king and high-priest. The drapery is most richly embroidered and fringed, and the long under-robe extends nearly to his feet. Over the shoulders falls a richly-fringed and decorated cape. His arms, which are bare, are encircled by rich bracelets. The king wears the tiara, so commonly represented on the monuments, and carries in his hand the sacred bow of office. This bow,

which was handed down from king to king, was the gift of the goddess Ishtar, or Ashtaroth, and the possession of it was supposed to insure victory. The prophet Isaiah records some of the chief events of the reign of this great and terrible king. His invasion of Judah; the mysterious destruction of the Assyrian army before Jerusalem; and his tragic death, while praying in the temple, at the hands of his two elder sons, who were jealous of the favour shown to their younger brother, Esarhaddon, but who nevertheless succeeded to his father's throne. The labours of Assyriologists enable us to recognise in the warlike and yet luxurious monarch, Assurbanipal, the Sardanapalus of Ctesias and Byron.

In the statuette we see the king clothed in a close-fitting robe, the groundwork of which is richly spotted with a handsome lozenge pattern, the lower part being decorated with two rows of braiding and a rich tasselled fringe. Over the right shoulder and crossing the breast is a broad belt. The waist is bound by a wide band of cloth, over which is a narrow girdle of richly-worked metal. The breast and short sleeves of this robe are most elaborately treated. On the arms are a pair of gold bracelets. The king wears boots of the Median style; leather greaves reach nearly to the knee, bound with thongs of that material. In the left hand he carries a sword. Assurbanipal succeeded his father, Esarhaddon, about B.C. 668; under him Assyria reached the culminating point of her greatness. He reconquered Egypt, invaded Asia Minor, and received tribute from Gyges, king of Lydia; subjugated most of Armenia, completely conquered Susiana and attached it as a province to Babylon, and reduced many outlying tribes of Arabs. He built the most magnificent of all the Assyrian palaces, patronised music and the arts, and established the Royal Library of Nineveh. The figure of the queen of Sardanapalus is a careful reproduction in the round of the figure represented on a bas-relief. Her majesty wears long garments of a less ornate character than those of the king, and in her right hand holds a wine cup. Assurbanipal had many wives, as he made it the custom to marry the daughters of conquered kings, and his large harem was no doubt the cause of the numerous conspiracies which upon his death broke out among rival princes. In the "Garden Scene" we have a representation of one of the gardens which, in all the Assyrian palaces, were attached to the harem apartments. Here, reclining upon a couch, we see Assurbanipal feasting with his queen, who is seated opposite him in a high chair. In the right hand of each is a shallow drinking-cup, which they raise to their lips simultaneously, as if they were pledging one another. Attendants are carrying in viands upon trays, some of which are already placed on the table; a band of musicians is in attendance, and in the trees the birds are singing, overhead a vine hangs its festoons and rich clusters. But the tranquillity of the scene is strangely marred by a ghastly head which hangs on the branch of one of the trees—the head of the brave Teumman, the defeated king of Elam.

The miniature copies of the winged human-headed lion and bull place before us the winged colossi, known as *shediz*, or spirit-guardians, which were placed at the doorways to protect "the goings out and coming in of the king." The winged bull was sacred to the god Anu, the God of Heaven, while the lion was the emblem of Nergal, the god of War and Death, in his character of the Great Eater (Irkalla). Compare Judges xiv. 14, "Out of the eater came forth meat." The winged figures were really a species of cherubim guarding the royal presence, and their appearance agrees with that of the cherubim of Ezekiel's visions. They symbolise generally divine protecting and guardian power, combining the physical force of the lion or bull with the intelligence of man, as represented by the human head, while the eagle's wings may be taken as emblems of ubiquity. The model of the lion weight represents one of the pretty bronze weights obtained by Layard from the south-west palace at Nimrod. On the back is inscribed in Assyrian the name of Sennacherib (B.C. 702), and on the side a Phœnician inscription which reads, "3 Mana of the Country." This weight forms an interesting monument of the commercial contact between Assyria and Phœnicia. In "Nimrod's Head" we have a reproduction of the head of one of those monsters who guarded the portals of the palaces of the kings of nations. When the head of one of these monsters was first unearthed the Arabs were filled with consternation, and, mounting their horses, rode off at top speed to meet Mr. Layard. "Hasten, O Beg," exclaimed one of them; "hasten to the diggers, for they have found Nimrod himself! Wallah! it is wonderful, but it is true; we have seen him with our eyes. There is no god but God," and, joining in this pious exclamation, they galloped off in the direction of their tents. It will be seen, therefore, that for many reasons, and from various points of view, there is reason for congratulation upon this most recent accession to the treasures of the Brighton Museum.

THE LATE SIR H. LAYARD.

THERE will be regret in other countries beside England at the death, after a long illness, of Sir Henry Layard, the discoverer of Nineveh.

Austen Henry Layard, says the *Times*, was of a very mixed nationality. The circumstances of his birth were probably unique. He was an Englishman on his father's side, a Spaniard on his mother's, a Parisian by birth and an Italian by education. When he first came before a British constituency this combination of nationalities threatened seriously to prejudice him, until he turned the electors in his favour by wittily asking them whether if a man were born in a stable they would call him a horse. Sir Henry's grandfather was Dr. Layard, Dean of Bristol, and his father was Mr. Henry P. J. Layard, who was in the Ceylon Civil Service and who married a Spanish lady. The great archaeologist was born in Paris on March 5, 1817. His youth was spent mainly in Italy, where he also received his education. In 1833 he came to London with the intention of studying for the Bar, but as this sedentary profession had slight attractions for him, and as he had inherited a passion for travel, in 1839 he set out with a friend on a course of exploration through the East. Visiting first various points in Northern Europe, he next proceeded through Albania and Roumelia to Constantinople. He subsequently travelled through various parts of Asia, learned the Arabic and Persian languages, and spent nearly two years among the wild tribes of the Bakhtiari.

There is little doubt that his enthusiasm was fired by the discoveries of Champollion and Wilkinson in Egypt, the researches of Burckhardt and Lane in Arabia, and those of other discoverers in adjacent countries. Resolving in his wanderings to explore specially those spots believed to have been the sites of ancient cities, he found himself ultimately at Mosul, near the Mound of Nimroud, where he was impelled with an irresistible desire to examine carefully the place to which history and tradition pointed as the "birthplace of the Wisdom of the West." M. Botta was already carrying out excavations at the cost of the French Government, and he had found a considerable number of curious marbles. Layard earnestly longed for the opportunity of making similar discoveries, and, returning to Constantinople, he expounded his views before "the great Eltchi," Sir Stratford Canning, who generously offered to share the cost of excavations. This was in 1845. In the autumn he set off for Birs Nimroud, and there he began his labours on a spot hitherto undisturbed. He was ultimately rewarded by exhuming some of the numerous wonderful specimens of Assyrian art which now enrich the British Museum. The discovery and the character of these monuments Layard graphically described in his first important work, "Nineveh and its Remains," published in 1848-49. Yet for a time the British Government had no thanks or encouragement for him. Writing in 1848, while on a visit to Cheltenham, Layard said:—"It is to be regretted that proper steps have not been taken for the transport to England of the sculptures discovered at Nineveh. Those which have already reached this country, and, it is to be feared, those which are on their way, have consequently suffered unnecessary injury. The Great Winged Bull and Lion, which I had hoped would have speedily formed an important portion of the national collection, are still lying at Busrah, and there is little prospect at present of their being brought to this country. Surely British ingenuity and resources cannot, as is pretended, be unable to remove objects which have already, with very inadequate means, been transported nearly a thousand miles. The cases containing the small objects recently deposited in the British Museum were not only opened without authority at Bombay, but their contents exhibited without proper precautions to the public. It is remarkable that several of the most valuable (indeed, the most valuable) specimens are missing; and the whole collection was so carelessly repacked that it has sustained very material injury. Were these Assyrian relics, however valuable, such as could be again obtained, either by ingenuity or labour, their loss might not perhaps be so seriously lamented; but if once destroyed they can never be restored; and it must be remembered that they are almost the only remains of a great city and of a great nation." But while the British authorities were slow in manifesting their gratitude to the explorer, the British public and the press were cordial in their recognition of his splendid services. The narrative of his discoveries became the book of the day, and the engrossing topic of conversation in almost all circles, and it was translated into several languages. It was followed by a second work, "Nineveh and Babylon" (1851), of which an abridgment was published some years later. In 1853 Layard published his further important work, "Discoveries in the Ruins of Nineveh and Babylon; with Travels in Armenia, Kurdistan and the Desert." This was the result of a second expedition undertaken for the Trustees of the British Museum. It was dedicated to Lord Granville "as a grateful acknowledgment of many acts of personal friendship."

Layard unearthed the remains of four distinct palatial

The Society of Engineers on Tuesday, the 10th inst., paid a visit to the Royal Small Arms Factory at Enfield Lock.

edifices at Nineveh and Babylon. The most remarkable discoveries were made in the north-west palace, supposed to have been built by Sardanapalus. The walls had been lined with large slabs of gypsum or alabaster covered with bas-reliefs and cuneiform inscriptions. Many of these were sent to England, together with gigantic winged human-headed bulls and lions and eagle-headed deities. They were placed in the British Museum, of which they have since remained one of the chief attractions. A Nineveh Court was likewise erected in the Crystal Palace, for which the explorer wrote a guide. But while Layard had thus rendered invaluable service as a discoverer, he did not feel competent to take upon himself the task of interpreting the inscriptions he had unearthed. The work of elucidation was left to experts like Oppert, Rawlinson, Norris and Hinckes. As the value of the Assyrian specimens began to be known, the House of Commons voted a sum of 3,000*l.*, which was applied by the trustees of the British Museum in furtherance of Layard's second exploration, referred to above.

THE SHAMROCK: ITS HISTORY.*

WHAT plant is the best entitled to rank as the genuine shamrock of Ireland? Such an inquiry might be considered superfluous, for on this, if any subject, the people of this island, of every class, would be expected to prove unanimous, and to decide such a matter beyond doubt or cavil, settling the recognition of the special botanical product in question with absolute certainty. Unfortunately no such happy consensus of opinion exists, and even the truth of the well-known legendary history of the shamrock is more than problematic.

It is usual in such doubtful subjects to inquire what light can be obtained from printed books or manuscripts. What do we find?

In 1596.—The poet Spenser, who lived amongst us for some years, and ought therefore to possess some value as an authority, says, in his well-known and often-quoted "View of the State of Ireland," when treating of the wars in Munster, that province had been "a most rich and plentiful country, full of corne and cattle," but so reduced from the results of war that the unfortunate "inhabitants if they found a plot of water-cresses or shamrocks they flocked to it as to a feast." Gerarde, in his botanical treatise, defines the plant as the "meadow trifolium, in Ireland called shamrocks." If this be correct, the shamrock, though perhaps not very nutritious, could be eaten in times of scarcity, with appetite.

In 1598.—Fynes Morrison asserts that the "wilde Irish willingly eat the herb shamrock, being of a sharp taste, which they snatch out of the ditches." But our present shamrock has not a sharp taste, and does not select ditches for its growth.

In 1613.—A few years later, Wythers, in his "Abuses Stript and Whipt," holds a similar opinion as to the shamrock being employed for food. He writes:—

And for my cloathing in a mantle go,
And feed on shamroots as the Irish doe.

This agreement of authorities on the edible properties of shamrocks might seem to be corroborated by the observations of Mr. Fortune, related in his "Wanderings in China," in which he states that "the large trefoil leaves in the district he visited are picked and used as a vegetable by the natives."

So much for the use of shamrocks for food. Relating more strictly to its botanical relations, in the year 1699, near two hundred years ago, Edward Llwyd, writing to Tancred Robinson, after paying a visit to our shores, settled to his own satisfaction that the genuine "shamrug was our common clover." (See "Phil. Trans.," No. 335.)

A few years later, in 1726, Dr. Caleb Threlkeld, who published the first treatise devoted to the plants of Ireland, his rare and useful "Synopsis Stirpium Hibernicarum," places it on record that the "plant worn in their hats in commemoration of St. Patrick" was the *Trifolium pratense album* (our *Trifolium repens*). This appears to be the earliest recognition of a practice now recognised as a national duty by Irishmen.

Dr. Johannes Keogh, in 1735, printed in Cork his "Botanologia Universalis Hibernica." He states that the proper Irish name for "the white-flowered meadow trefoil is shamrock, and the purple trefoil is seamar leane." He commends both plants for their styptic properties, and is of opinion that, applied externally, they are beneficial against "phlegmons and inflammations." But neither of these botanists recommends the shamrock for human food.

There is another trifoliate plant of different botanical relations, the "wood-sorrel," to which Keogh gives an Irish appellation not very dissimilar to that of the shamrock, namely,

"shamsoge," and for its scientific equivalent, *Trifolium acetosum vulgare*. Some have accepted this as the veritable plant they suppose St. Patrick employed in his religious teaching; and as it is rather pleasant to eat, and still used for flavouring soups, &c., chiefly abroad however, it is even conjectured that the edible shamrock of Spenser and other early writers was sorrel, not trefoil.

Trefoil, however, is, we are assured by medical writers, "dry in the third degree," and as Irishmen have a lingering belief about the plant requiring to be "drowned" on the evening of each successive 17th of March, and employ a trefoil for that purpose, it must be admitted the claims of sorrel have not received much acceptance. When mentioning these ancient ideas, there is a statement ascribed to Pliny, that trefoil leaves stand upright before the approach of a storm, and can foretell its advent some hours before the wind begins to blow.

A learned Irish scholar informs me that jamapó means the summer plant, derived from jamap, "summer," and ó, "young." He also states that jamapóa buime-bet, or the shamrock of the garland of Béal, is recognised as a different plant from the shamrock of Patrick. The leaves are more delicate, of lighter colour, and it grows in shaded woods, about the roots of trees, having a sour taste. If this be so then the latter plant is wood-sorrel.

Still, in deciding this vexed question of the genuine shamrock, we must consider what botanists can adduce. The latest contribution to our knowledge is published by Mr. N. Colgan, in the "Irish Naturalist" (see vol. ii. p. 267). He obtained, by the co-operation of local residents from several counties, specimens gathered about March 17, and certified by them to be the plant employed in their respective districts by the people. These plants were examined critically to determine them, and subsequently grown to confirm the accuracy of the result. Suffice it to say that out of a total of forty-nine duly authenticated plants so treated, twenty-four proved to belong to *Trifolium repens*, twenty-one to *Trifolium minus*, two to *Trifolium pratense*, and two to *Medicago lupulina*, or common medic. Mr. Colgan adds to his own researches previous inquiries made in the same direction by Mr. James Britton, editor of the *Journal of Botany*, and the collective results strengthen the claims of *Trifolium minus* to be the favourite plant selected for a national symbol in the majority of districts in the present day.

The four-leaved shamrock—what about its mystic powers? There are a few old writers who must have known the legend, for Melton, in his "Astrologaster," says:—"If a man walking in the fields finds any four-leaved grass, he shall, in a short while after, find some good thing." Again, Herrick, in his "Hesperides," sings of "lucky four-leaved grass." To the Irish poet Samuel Lover, however, must be ascribed the wide-spread recognition at present of its properties for diffusing universal happiness when gathered in "the fairy dells." Fortunately the leaf is not rare, and its influence can be tested without difficulty.

In seeking to investigate the story popularly believed in Ireland, at least for two or three centuries past, of St. Patrick's alleged employment of some trifoliate leaf to explain the mysterious relations of the Trinity to the native inhabitants of Erin, on the coasts of Wicklow or Wexford, where he is supposed to have landed, I can report nothing but failure. Whether there was one St. Patrick, or possibly two or more, bearing a similar patrician name or rank amongst the number of Ireland's early apostles, certain it is that, having consulted skilled Irish scholars, they informed me that in none of our Irish manuscripts relating to St. Patrick is the legend alluded to. At the utmost it appears to be of Mediæval origin. It is, therefore, with regret and disappointment I am forced to conclude St. Patrick never handled a shamrock during his protracted life to explain any of his teaching.

The shamrock, however, is a national symbol in the same sense that the rose and thistle are the respective emblems of England and Scotland. They respectively make their appearances on the coinages of those countries about the following dates:—

Trefoils occur as mint-marks on the coins of Henry IV., appearing on groats of his "light money." His reign extended from about A.D. 1399 to A.D. 1413.

During Henry VI.'s reign both trefoils and roses assume such prominent and distinctive positions that some of his English coinages are distinguished by the rosettes they bear, and others by the trefoil, usually associated with pine cones.

In Edward IV.'s reign the rose assumes its full development, as in the instance of his rose ryals, and shamrocks are conspicuous upon his Irish crown groats. As we might expect, the rose occupied that prominent position it still retains as a badge distinctive of England in the troublous times of the contests between York and Lancaster.

The occurrence of the thistle upon Scottish coins is of later date. It appears in 1560 on silver coins of Queen Mary.

Upon the copper coins of larger module known as St. Patrick's money, ascribed to the mint established by the

* A paper by Mr. W. Frazer, F.R.C.S.I., M.R.I.A., Hon. F.S.A. (Scot.), Fellow, in the "Journal of the Royal Society of Antiquaries of Ireland."

Nuncio Rinuccini, in Kilkenny, for the use of the Confederate Irish Catholics in the wars of Charles I., we have for the first time St. Patrick with mitre and crozier, represented displaying a trefoil to the assembled people. After a long interval another Irish historic coin occurs, the copper pieces issued by Sarsfield during the siege of Limerick, made by re-striking the brass money of James II. and issuing it for pence and halfpence. This represents a seated figure of Erin holding out the mystic plant.

In the reign of George IV. shamrocks increased remarkably in size, for on his half-crown of 1820 and 1821 each of the three leaflets is represented as large as a Scottish thistle and nearly equal to a full-blown rose. This was possibly the result of His Majesty's intended visit to Ireland which occurred at the later date of 1821; but the effects were visible on his shillings coined in the year 1826, where the disproportion in size is still conspicuous.

I would therefore date the origin of the shamrock legends about the end of the fourteenth century, with which chronology its appearance on Mediæval Irish tombs would fairly agree; for all our earlier tombstones, such as those figured in Petrie's classic work on "Early Christian Inscriptions," are altogether free from its presence. The further development of the idea seems to have progressed during the reigns of Elizabeth, of James I. and Charles I. This assumed Mediæval date also synchronises with the frequent occurrence of shamrock patterns on tiles employed in Irish ecclesiastical edifices. The illustrations of these tiles now published illustrate the variety of patterns and beauty of design they display.

The suggestion has often been made that the shamrock was a plant revered by the pagan Irish, possibly derived from Assyrian or Babylonian worship. Nothing is easier than to construct such theories and the less evidence to support them the more confidently they are advanced. Such investigations are beyond the scope of the present inquiry, which is limited to ascertained facts and historic testimony.

PUBLIC BUILDINGS IN NEW SOUTH WALES.

THE report of the Government architect, Mr. Vernon, states that during the past year the expenditure on public buildings and services, furniture and office expenses (including contingencies) amounted to 319,169*l.* 6*s.* 1*d.* Of that sum 161,844*l.* 13*s.* 6*d.* was paid out of Consolidated Revenue, and 157,324*l.* 12*s.* 7*d.* from Loan Votes. The expenditure has been spread over 674 separate buildings and services, from which it will be seen that a large percentage of the Government property under the charge of this branch has in some form or other received attention, and the amount available has been distributed to the utmost extent.

A large number of buildings, particularly in the country, is suffering from want of systematic repair, and in some few cases they have become almost ruinous, and Mr. Vernon again ventures to press upon the Minister the importance, at the earliest possible moment, of making provisions so that some plan may be arranged which will provide for the external painting at least once every fourth year and internal painting once every seventh year, together with some provisions to make good the ravages of white ant and the general results of climatic influence.

During the year the competitive designs for a lunatic asylum at Rossiville, for which plans were invited in the previous year, were placed before a specially appointed Board, consisting of Dr. Manning, the inspector-general of insane; Mr. Horbury Hunt, president of the New South Wales Institute of Architects, and myself, with Mr. Brindley, building surveyor of this branch, acting as secretary. Forty sets of plans were submitted, and the labours of the Board, in arriving at a conclusion and recommendation, extended over some three weeks of continuous work.

The Minister adopted the recommendation of the Board, and the following awards were publicly made:—1. Messrs. Sulman & Power, premium, 300*l.* 2. Mr. John Kirkpatrick, 200*l.* 3. Mr. G. D. Payne, 125*l.* 4. Mr. J. J. Clark, 75*l.* 5. Messrs. Weitzel & Mackinnon, premium, 50*l.* During the year the Minister, on obtaining Parliamentary sanction, proceeded with the completion of the Sydney Hospital in Macquarie Street, appointing Mr. John Kirkpatrick as architect, who subsequently contracted with Mr. A. M. Allan for the execution of the works for the sum of 64,911*l.*

The office staff at the close of 1892 was comprised as follows:—The Government architect, principal assistant architect, four assistant architects, one building surveyor, six district inspectors, seventeen draughtsmen, nineteen clerks of works, chief clerk, accountant, correspondence and record clerk, eight clerks, three clerks to assistant architects, and one shorthand writer.

The total office expenses, including salaries, contingencies,

travelling expenses, &c., amount to 21,911*l.* (of which the sum of 2,815*l.* is provided for in the clerical division of the Public Works establishment).

The following shows the percentage cost of the various services, based on the total expenditure of 300,587*l.* 6*s.* 1*d.*:—Professional, 2·71 per cent.; superintendence by clerks of works, 2·52 per cent.; clerical, 1·10 per cent.; contingencies, travelling, &c., 1·02 per cent.; total, 7·35 per cent.

This at a first glance compares unfavourably with that of 1891, which stands at 6·15; but it may be pointed out that during the year a large amount of departmental work, abortive plans, preliminary sketches and reporting on general repairs, &c., were undertaken far in excess of any previous year, which, if carefully valued and charged for, would reduce the percentage to an amount at least equal to that of 1891.

TESSERÆ.

Roman Ornament.

RAFFLED leaves form a favourite enrichment in the architecture of the Romans; indeed, these are hardly less frequent in their works than the honeysuckle is in those of the Greeks. Mouldings were enriched with them, and a raffled leaf masks the angles of carved cymas and ovals in the former, as a honeysuckle does in the latter. Nevertheless, the honeysuckle and lotus are both found in Roman enrichments, particularly the latter, and perhaps even more than in Greek. It is not uncommon to find examples of Roman architecture completely overdone with ornament—every moulding carved and every straight surface, whether vertical or horizontal, sculptured with foliage or with historical or characteristic subjects in relief. This fault is most obvious in those works which exhibit similar bad taste in the general composition. The triumphal arch of Septimius Severus, the little arch of the goldsmiths, and the half-buried ruin called the Temple of Pallas in the Forum of Nerva at Rome are egregious specimens. The entablature of the Arch of Titus, too, is overloaded with ornament. Frieze enrichments, consisting of foliage composed with animals and a variety of other things are very common in Roman architecture. Many specimens indeed are not found in existing structures, but there are numerous fragments of entablatures of destroyed edifices which exhibit them in great variety. Their general character is exuberance and a tendency to frittering from the variety and incoherence of form in their composition, but their effect can only fairly be judged of when seen in appropriate situations. One existing example of an enriched frieze of the kind referred to, that of the Temple of Antoninus and Faustina, speaks strongly in its favour, for nothing can surpass its efficiency and simple beauty, but it must, moreover, be confessed that when examined in detail, the enrichment is less exuberant and is composed of fewer parts than most others of the species to which that example belongs. Architectural ornament, however, is not confined to purely architectural works. We find many beautiful specimens of it on the vases and candelabra which decorated the baths and mansions of the ancient Romans, and whose elegance of form rivals even the beauty and delicacy of their enrichments. Whether these should be referred or not to the Romans is doubtful, for it has been already intimated from the style of many of them, both in outline and ornament which appertain more to the Greek, that they are the productions of Grecian artists, but indeed they belong exactly to neither, for they frequently possess the beauties and sometimes exhibit the defects of both. There are existing works, too, clearly of Roman origin, and far superior in every respect to the things just quoted. These are for the most part cenotaphial monuments, sarcophagi and altars whose composition, details and enrichments are gross and inelegant when compared with the objects alluded to. The difference may arise merely from the inferiority of the artists of the one to those of the other, and not from the difference of their schools, but the prevalence of Greek taste in the superior productions is not the less striking because it was acquired by education, while it is wanting in the inferior, whose authors had not been imbued with the spirit and fine feeling of the Greek style.

Girtin's Water-Colours.

Girtin made his drawings, with but few exceptions, on cartridge-paper. He chose this material as his aim was to procure a bold and striking chiaroscuro, with splendour of colour and without attention to detail. Some of his happiest productions display these qualities, united with magnificent effect. Certain of his topographical views are treated with an originality of feeling that cannot fail to captivate the artist and the connoisseur. Many of his works, however, betray a carelessness of execution and an inattention to proportions and to form which requires something of prejudice in favour of originality to tolerate or endure. His mountainous scenery was oftentimes treated with grandeur of effect, obviously assuring us that he had been an attentive observer of those sublime appear-

ances, created by storms and vapours, which occur in those elevated regions. He was one of those daring imitators of nature who ventured to represent a mass of mountains dark and darker still as they receded into the distance, a figure of painting which none but the most poetic mind would presume to introduce in a composition. The flatness and freshness with which he described the valleys, extending to the basis of their surrounding heights, he imitated with a felicity that perhaps has never been exceeded. The distant herds, too, which he introduced grazing on these plains were so near to what we have seen when a gleam of light has penetrated a parting cloud, so many gems glittering on the verdant meads. The artist prepared his drawings on the same principle which had hitherto been confined to painting in oil, namely, laying in the object upon his paper with the local colour, and shadowing the same with the individual tint of its own shadow. Previous to the practice of Turner and Girtin drawings were shadowed first entirely through, whatever their component parts—houses, castles, trees, mountains, foregrounds, middle-grounds and distances all with black or grey, and these objects were afterwards stained or tinted, enriched and finished, as was the custom to colour prints. Girtin's admirers tolerated a defect in his drawings, which proves how much allowance the liberal connoisseur will make for the sake of genius. The paper which he most admired was only to be had of a stationer at Charing Cross; this was cartridge, with slight wire marks, and folded like foolscap or post. It commonly happened that the part which had been folded when put on the stretching-frame would sink into spots in a line entirely across the centre of the sky, so that where the crease had been the colour was so many degrees of a darker blue than the general tone of the sky. This unsightly accident was not only overlooked, but in some instances really admired, inasmuch that it was taken for a sign of originality, and in the transfer of his drawings from one collector to another bore a premium according to that indubitable mark.

Celtic Metalwork.

Among the British Celts, ornament in metalwork is either stamped, chased, cast or applied; certain motives of decoration are characteristic of, if not peculiar to it, which examples would make obvious although it may not be easy to convey much notion of them in words. One is that known as the trumpet pattern, a curved form expanding towards one extremity. It is frequently united to another similar curve, but in a manner that reminds one in some degree of Chinese design rather than that of any other race; this trumpet pattern, of which examples are abundant in what may be called the second or later period of Celtic work, is seen on the massive cast bronze armlets that have been occasionally found in Scotland. The ancient British bronze shield found in the river Witham near Lincoln, and once in the Meyrick collection, exhibits in a very striking manner the employment of this trumpet ornament. Allied to this pattern is another frequent motive; a series of somewhat parabolic curves emanating from a centre, often, but not invariably, three in a group; a peculiar abrupt manner in which these are truncated is especially Celtic; even where grotesque attempts at indicating animal forms are introduced the character of the curved lines remains unchanged. This is seen in the ancient bronze shield above alluded to, where a hog of the most singular proportions is attempted to be delineated, or rather where its outline remains on the shield, the figure having been appliqué and fallen off. Spirals of ornament, but always retaining a peculiarity of curve, are also of common occurrence. On goldsmiths' work from Ashantee such spirals may be seen but without the distinctive feeling in the curve. These spirals are to be distinguished from the discs composed each of a spiral of bronze wire frequent on armillæ of Teutonic origin, the latter being formed somewhat in the shape of the letter S, but the former constructed in a peculiar manner of a double line are rolled inward towards each other. The distinctions may seem minute, but it is the permanency of such peculiarities and their traditional distinctiveness which enable ornamental art to be tracked ethnologically, and which every now and then may repay the student by furnishing some clue to its origin. In a period succeeding or at all events subsequent to the later bronze epoch the Celtic goldsmiths' work attained a perfection of detail and skilful execution that has never been equalled by any other race.

The Architecture of the Hebrews.

Few things have occasioned controversies more amusing from the singularity of some assumptions and the absolute futility of them all than the style and manner in which Solomon's temple was built. Villalpanda, a Spanish Jesuit, appended to a commentary which he wrote on the prophecies of Ezekiel a long dissertation on the first and second temples of Jerusalem, in which he insists that the theory and practice of permanent architecture commenced with the building of that temple by Solomon—that with it "the orders" which, he says, are falsely attributed to the Greeks, came into existence—that, indeed, the design (from a passage in the first book of the

Chronicles), perfect in all its details, was given to David, drawn by the hand of God. He moreover pretends to show that the proportions assigned by Vitruvius to the different orders accord exactly with the descriptions given of the temple of Solomon, and accuses Callimachus of usurping the honour of inventing the Corinthian capital, which could not belong to him, as it was of divine origin, and had been executed in the temple at Jerusalem centuries before he was born. Some learned, and in some respects sensible men, have attempted to support this theory, and others have thought it worth while to controvert it by proving that the architect and the principal workmen were all either Egyptians or Phœnicians, and that consequently the edifice must have been in the Egyptian style. A learned architect of the present day has endeavoured to show that it was in the Greek style, and that its form, proportions and distribution were not dissimilar to those of the Temple of Ceres at Eleusis. As the Phœnicians, who were principally employed by Solomon, themselves built in the Egyptian manner, the probability is great that it was in the Egyptian or Phœnician style as far as the Jewish ceremonial would permit, and certainly the descriptions of its distribution accord better with that of an Egyptian than of a Grecian temple. The pillars of Jachim and Boaz, which are said to have been set up before the temple, correspond exactly in relative situation with the obelisks in temples at Thebes. Clemens of Alexandria, too, gives a description of an Egyptian temple very much like that of the Jewish, and the palm-leaves, roses, fruits and flowers in the latter are very common in existing specimens of the former, whereas in the Greek remains of early date no such things are to be found. Whether the Jews in after times possessed a national style of architecture or not we cannot tell; there is no reason, however, for supposing that they did, for their monotheistic structure at Jerusalem was not repeated in other places as the temples of the heathen divinities were among the Greeks and Romans, by which they might have acquired a peculiar mode of composition and combination. The non-existence of a national Jewish style of architecture tends also to strengthen the theory that architecture did not originate in the disposition and decoration of buildings for domestic purposes, of which the Jews must, when settled, have made as much use as other nations, and a multiplicity of religious edifices, in the construction of which they might have acquired one, was forbidden by their code.

Pictorial Composition.

In commencing a composition it is customary to mark the middle of the space, for the purpose of arranging those points we consider of most importance to the subject, dividing the picture for the regulation of the masses of light and shade, of ascertaining and fixing the horizontal line, &c. This mode of constructing the composition is often suggested from the perspective effect requiring a length of line, thereby obliging us to place the point of sight at one side of the picture; sometimes from the group requiring a large space, which a diagonal line secures, as in the *Elevation of the Cross*, by Rubens, or from the conduct of the light, as in his picture of the *Descent from the Cross*, &c. In compositions conducted on this principle (particularly where the landscape occupies a large portion), many artists carry the lines of the clouds in a contrary direction to counteract the appearance of all the lines running to one point. Thus using the darks of the clouds, &c., to antagonise, as it is termed, may apparently produce a better equipoise, but sacrifices many advantages, for we observe in many of the pictures of Cuypp, Rubens and Teniers, where the figures, landscape and sky are all on the same side of the composition, that a rich and soft effect is produced; the strong light and dark touches of the figures telling with great force against a background with houses, trees, &c., which are prevented from being harsh and cutting by mixing their edges with the clouds or dark blue of the sky. This doubling of the lines gives a picture that rich fulness which we often perceive in a first sketch, from its possessing several outlines. Those who imagine that by thus throwing the whole composition on one side a want of union will be produced, will be convinced of their error by perceiving how small an object restores the balance, since, by its being detached and opposed to the most distant part, it receives a tenfold consequence.

The Three Orders.

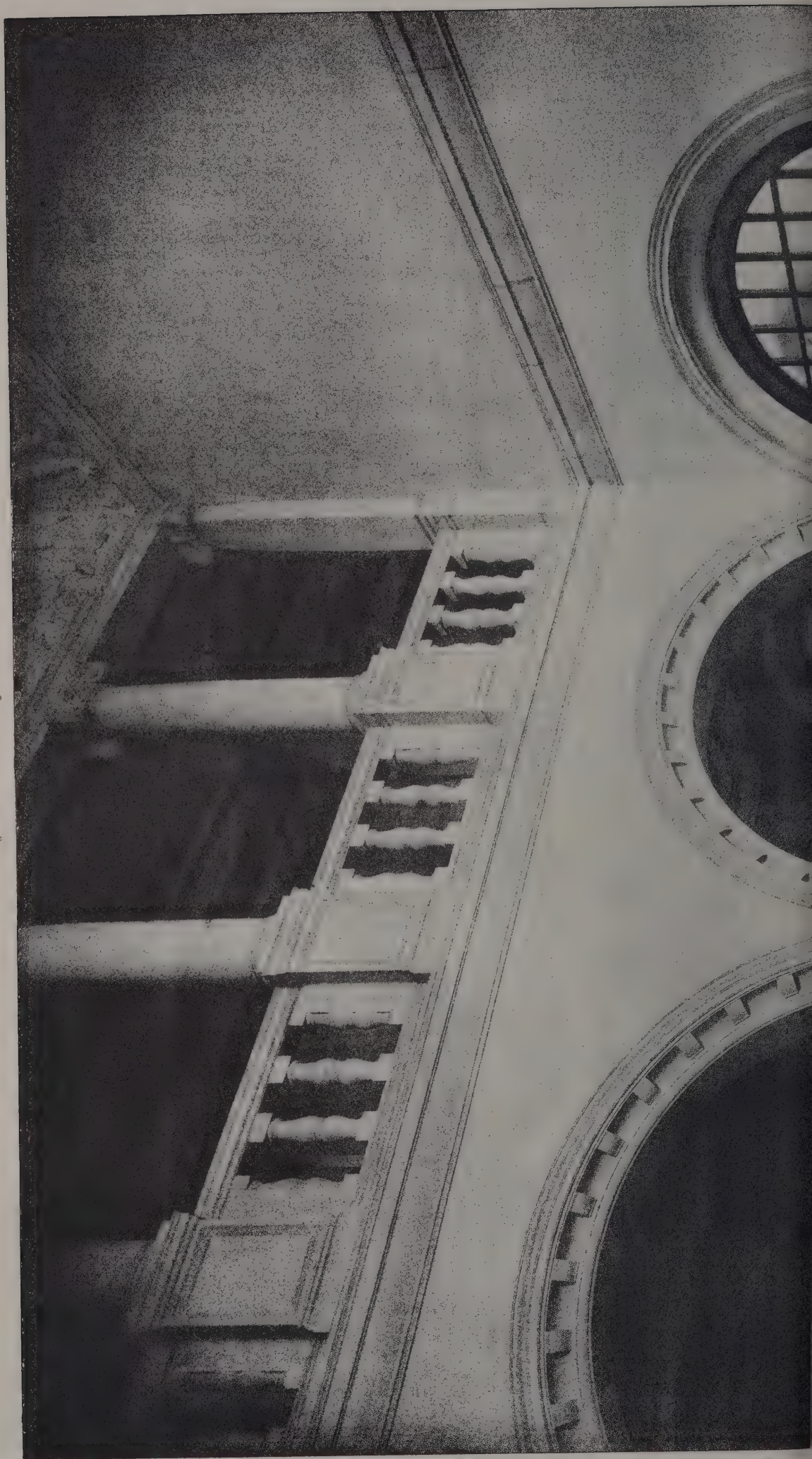
There are three principal gradations of proportion in all objects. Thus in nature there are the tall, the short and the mean between the two; the strong, the weak and the mean between the two. So in classical architecture, the same modifications are developed in the æsthetical divisions known as the orders. Strength and robustness are characterised in the Doric, refined and modified as a mean in the Ionic, and attenuated to greater grace and elegance in the Corinthian. The Italian masters, when they classified ancient architecture into five orders, abandoned the philosophy which guided the Greeks in limiting the orders to these three leading expressions of proportion and ornament. There can be only three orders of Classical architecture and no more.

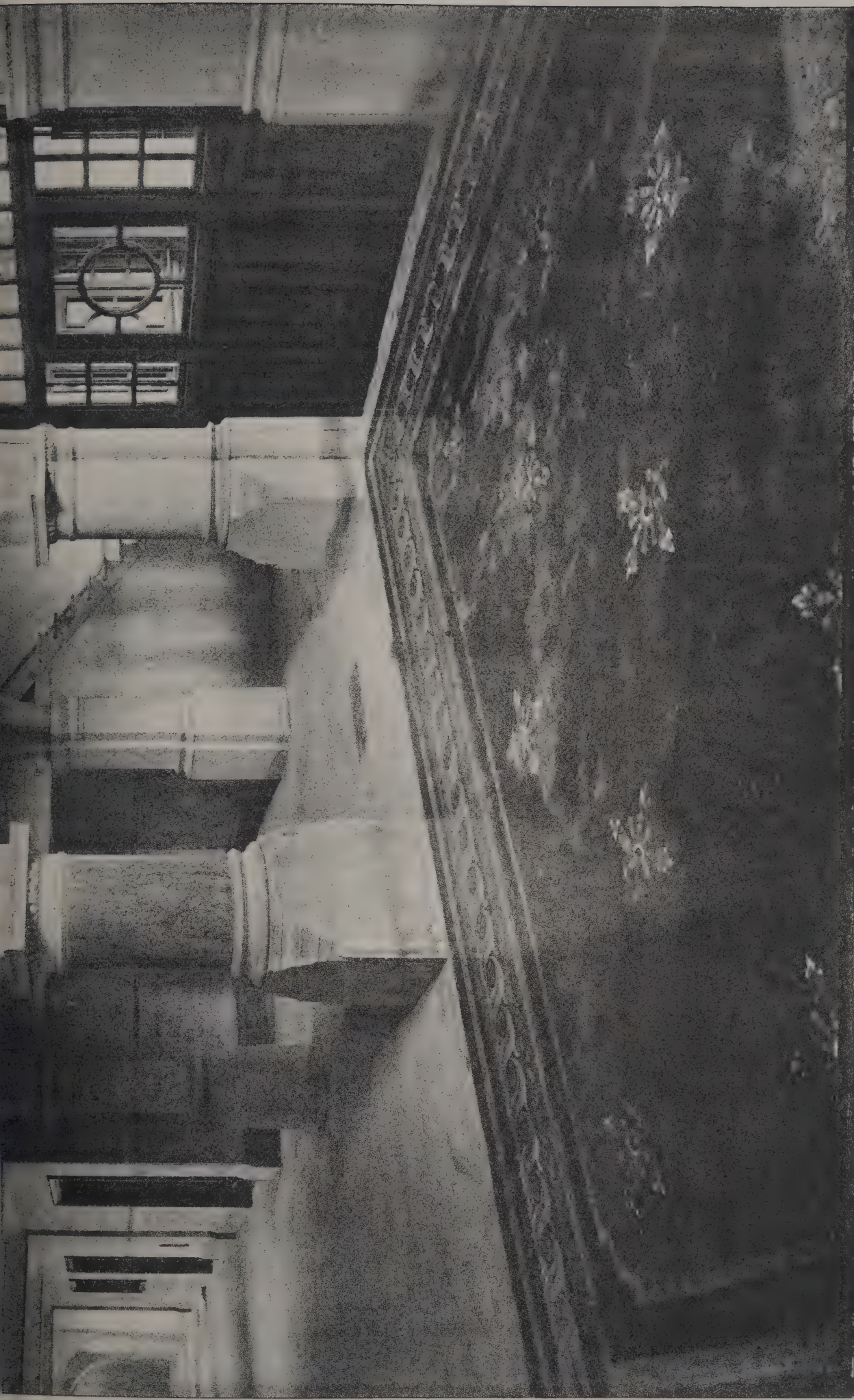




THE JUDGMENT OF MIDAS.

Ohio Architect, July 13th 1894.





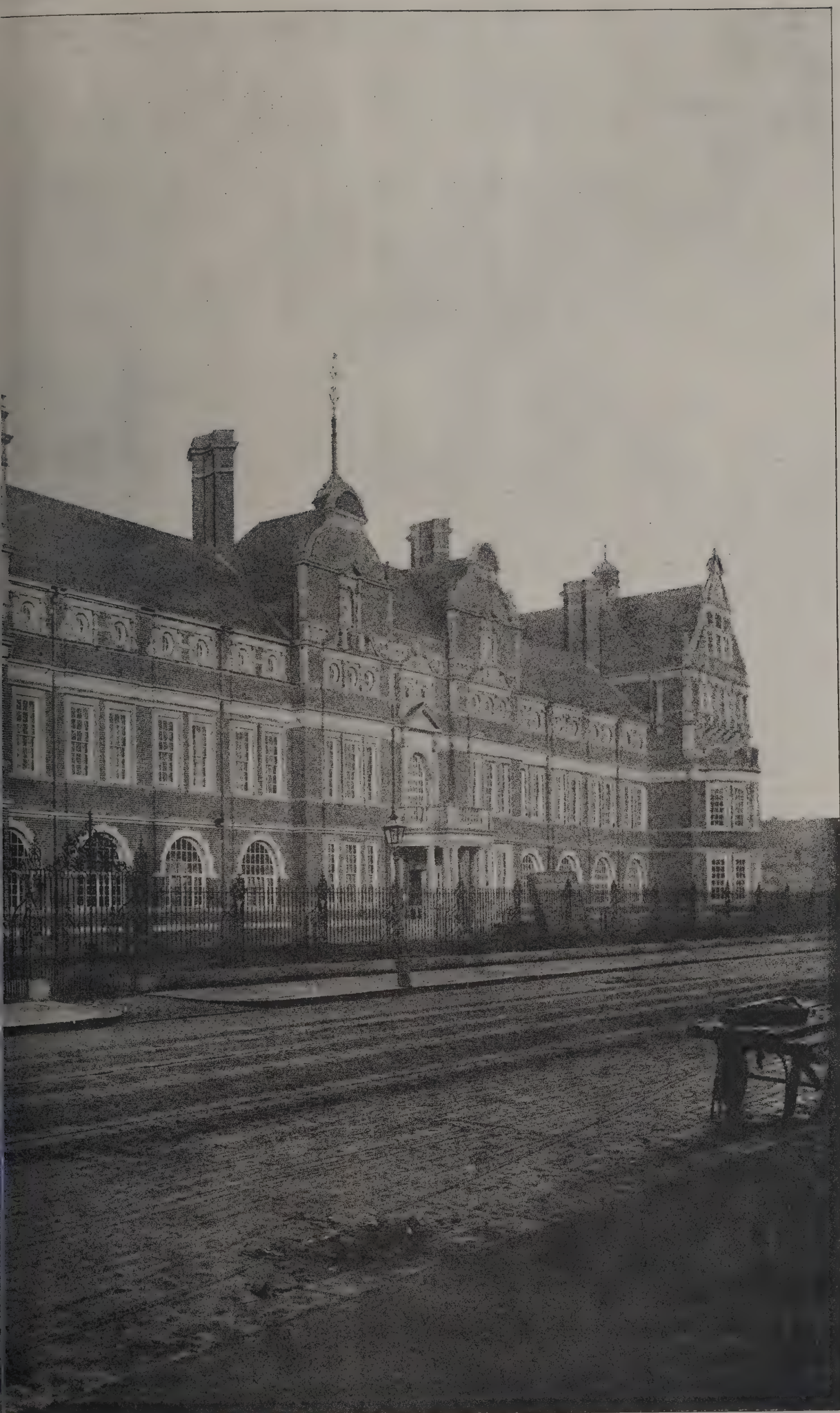
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GENERAL VIEW.

itect.

ILLUSTRATIONS.

THE JUDGMENT OF MIDAS.

BATTERSEA POLYTECHNIC.—GENERAL VIEW.

BATTERSEA POLYTECHNIC.—THE HALL.

[The illustration given last week of the Lincoln and Lindsey Bank was reproduced from a photograph by Mr. R. Slingsby, of Lincoln.]

SOCIETY OF ANTIQUARIES.

THE congress of archaeological societies in union with the Society of Antiquaries has just been held in Burlington House, Sir A. Wollaston Franks, K.C.B., F.R.S., president of the Society of Antiquaries, in the chair. Mr. W. H. St. John Hope read the report. The continuation of the archaeological survey of England, and the drawing up of rules for securing a uniform method was discussed. The surveys of Kent, Herts, Cumberland and Westmoreland, and Lancashire north of the Sands, have already been published. The surveys of Herefordshire and the rest of Lancashire have been completed, whilst those of Cornwall, Devon, Durham, Northumberland, Derbyshire, Sussex, Surrey and Berks were reported as in active progress. To these must be added the survey of Essex, which Mr. G. F. Beaumont laid on the table, the map, thickly sprinkled with the symbols adopted for distinguishing different archaeological finds and sites, as well as the accompanying schedules, exciting a good deal of interest and discussion. Mr. Beaumont entered at some little length into the reasons which caused him to differ from most Essex antiquaries in assigning the ancient Roman station of Camulodunum to Chesterford rather than to Colchester. These maps and indexes when completed for England will be invaluable; the symbols used indicate the period (pre-Roman, Roman or post-Roman) of the discovery, and also its nature—whether earthworks, camps, coins, cemeteries, potteries, &c. It is proposed to follow up this series by similar maps and indexes of Mediæval remains. Mr. Ralph Nevill, F.S.A., was asked to issue an appendix to his list of transcribed or published parish registers, which he compiled for the Societies four years ago.

Mr. Ralph Nevill then read the report of a sub-committee on a photographic survey of England by counties, based on what has already been accomplished by the archaeological section of the Birmingham and Midland Institute, and followed up by the Society of Antiquaries of Ireland. The report recommended that each should do its best to secure collections of large permanent photographs of matters of archaeological interest, giving details rather than picturesque effects, with a scale to show the size, strongly mounted, and with full description on the back; that three copies of each photograph should be prepared—one for the county society, one for the British Museum, and one for the Society of Antiquaries; and that these photographs should not be undertaken haphazard, but that districts should be mapped out for amateurs, and that a hundred or a portion of a county should be undertaken at a time. Mr. Nevill urged that Sir J. B. Stone, of Birmingham, should be supported in his endeavour to establish a central photographic society for this purpose, to whom the local archaeological societies should give all the aid in their power. This proposition was carried.

Rev. Dr. Cox, F.S.A., read a paper upon "Popular Archaeological Errors and Fiction." He said that it was the duty of antiquaries, now that archaeology was becoming an exact science, and so valuable a handmaid to historians and art students, not only to be accurate themselves but to correct inaccuracies and errors in others, so that the popular blunders of the day might come to an end. He confined himself almost entirely to mistakes in ecclesiology, but said that other branches of archaeology were equally rich in fictions. The connection between cross-legged effigies and the Crusades was shown to be a mere fond imagination. The so-called "Leper" windows of the parish churches, so often pointed out as constructed for the communicating the host to lepers, was proved to be an absolutely baseless and historically untrue surmise. The idea that whitewash on church walls was a post-Reformation abuse was protested against as entirely contrary to fact. It was noticed that oak in old English days, both in ecclesiastical and domestic work, was usually painted and gilded, and not left bare, and the notion of the symbolism of our Lord on the Cross being denoted by the irregular form and plan of cruciform churches was shown to be baseless. Two historic blunders were also pointed out. A hat preserved at Shaw House, Newbury, has long been described as one worn by Oliver Cromwell, but it has recently been proved to have been made for and used by a woman of the period. Haddon Hall too, according to Dr. Cox, himself a Derbyshire man, must give up its Dorothy Vernon elopement legend, which is now said to date back only to the beginning of this century, and to be contradicted by every known historical and architectural fact. Sir Wollaston Franks gave some

curious instances of popular delusions with regard to the British Museum, such as the idea that there were only three Queen Anne farthings, and that the Museum would give a fortune to possess the third one, being supposed to have already got two. He also stated that visitors often desired to see the arrow with which King Edmund was shot by the Danes near Bury St. Edmunds. Mr. St. John Hope spoke of the grievous wrong still done by able architects in stripping off plaster from old Norman rubble-work, which was never intended to be exposed, instancing what Mr. Pearson, R.A., had recently done in that direction at Canterbury Cathedral.

WELLINGTON MEMORIAL, ST. PAUL'S.

IN the course of a letter to the *Times*, Sir Frederic Leighton says:—On April 12, 1892, you permitted me to take, through the hospitality of your columns, the initiative in an act of justice and reparation to the genius of a great English artist, Alfred Stevens, namely, the removal of the monument to the Duke of Wellington in St. Paul's from the chapel, where it had long loomed almost unseen, to the site which it now enriches and for which it was originally designed. Public opinion was, as I had felt, ripe; response, if slow, was in the end adequate, and the result abundantly rewards and justifies those who have shared in it. But my appeal, it may be remembered, was twofold; the first part of our task is complete, the second lies still before us. The monument has been transferred to its proper position and surroundings; it now awaits completion, and it is in this necessary work that I would ask the co-operation of such of your readers as are careful of a supreme artist's fame. The original design of the sculptor—which may be seen at present by the side of the unfinished monument—shows an equestrian statue of the great Duke occupying the now vacant pedestal which surmounts the whole, and worthily crowning the magnificent conception. Of this statue a rough unfinished model from his hands is in existence, and will, if made accessible, serve as a sufficient guide to the artist who shall be privileged finally to carry out this portion of the cenotaph; that artist should be a man whose genius will carry him worthily through such a task, and whose reverence for the name of Alfred Stevens will insure that close adherence to the leading lines and features of the first design which the public voice would justly demand; such a man, both in his gifts and in his reverence, the Dean and Chapter of St. Paul's have seen in Mr. Alfred Gilbert, R.A., whose selection for so noble a task will command, I cannot doubt, universal approval. It now remains to us to seek the necessary sum wherewith to defray this final expenditure, a sum estimated at 3,000*l*. Towards this sum a trifling amount is already in hand, the result of the appeal I made two years ago, but have of late suffered to lie dormant in order to turn all necessary energy to the now happily completed removal.

EDINBURGH APPLIED SCHOOL OF ART.

THE Board of Manufactures has just been presented with an interesting series of eighteen statuettes, being casts of figures that adorned a famous tomb in the cathedral of Dijon, by Mr. J. R. Findlay, for the use of the above school.

This town was the ancient capital of Burgundy; its cathedral was rebuilt in the thirteenth century, and the tomb in question was that of Philip the Bold, who was Duke of Burgundy, 1342-1404. This memorial was executed in the end of the fourteenth century by a Dutch artist called Claus Slater, in black and white marble, relieved with painting and gilding. There was a recumbent figure of the Duke, watched by two angels with outstretched wings, who held his helmet; and round the sides of the tomb ran a series of Gothic arcades filled with forty alabaster statuettes of mourning ecclesiastics, mostly monks, probably Cistercians who had an abbey in the town. The tomb originally stood in the Chartreuse of Dijon, which was founded by Philip. On the suppression of the Chartreuse the tomb was removed to the cathedral, but in 1793 it fell under the ban of the Council of the Commune, and was ordered to be destroyed. The statuettes at that time were carried off and dispersed among the houses of the town, where they did duty as mantelpiece ornaments, &c. After the restoration of peace, the tomb, which was not irreparably injured, was removed to the Dijon Museum, and the statuettes, gathered from lumber-rooms and private cabinets and houses, were again restored to their original niches. It is eighteen casts of the best of these figures which Mr. Findlay has secured and presented to the Board of Manufactures. They stood about 18 inches in height, and are notable for their life-like expression and the varied and picturesque arrangement of the monkish robe and cowl. As examples of what can be done in the way of arranging simple draperies in diverse and graceful folds, the statuettes are worthy of study by the students of the School of Applied Art. General Sir Murdoch Smith has secured casts of four statuettes of the same series for the Museum of Science and Art.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Continued from page 12.)

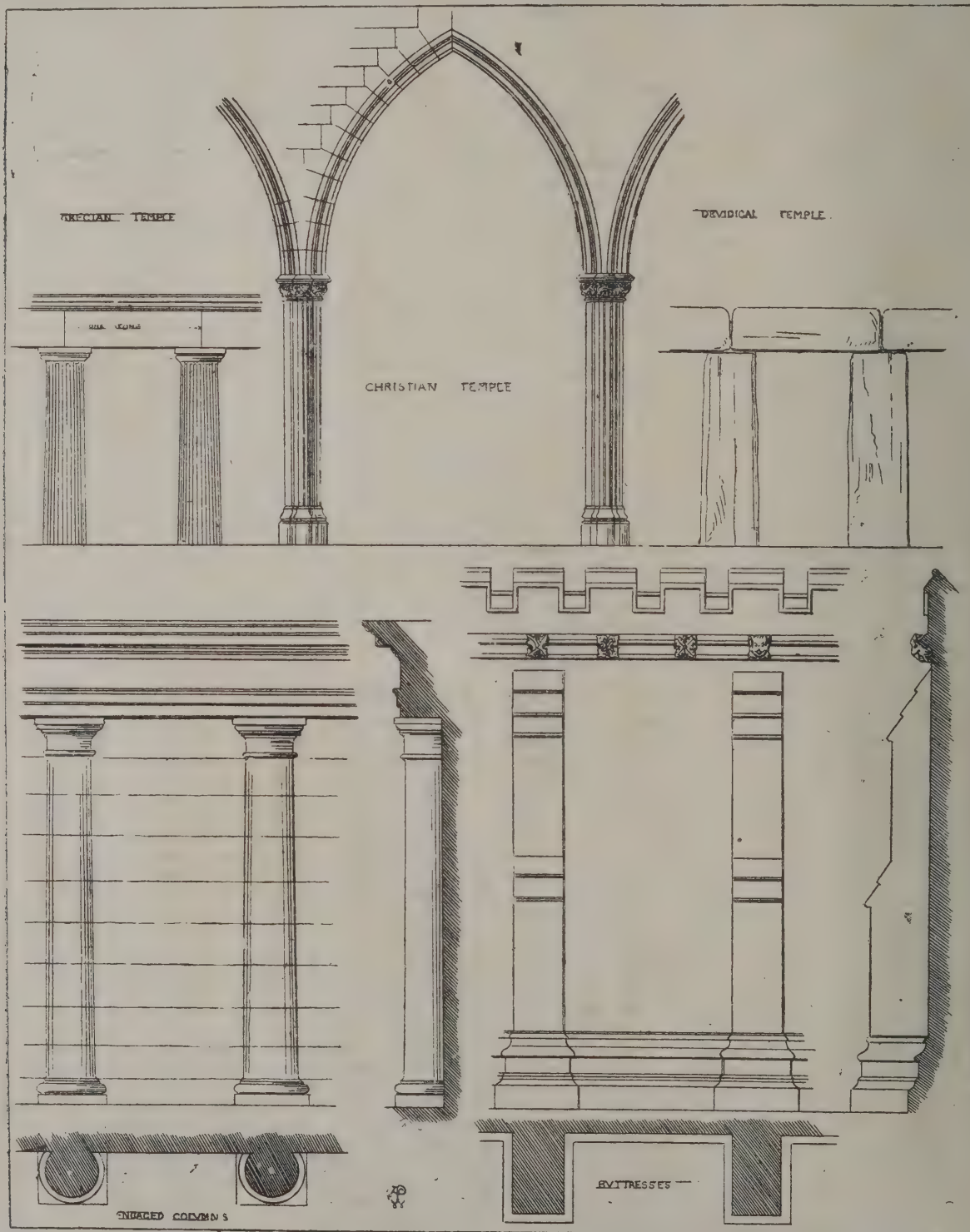
I COME now to speak, in the fourth place, of mouldings, on the judicious form and disposition of which a very considerable part of the effect of the building depends. Mouldings are the enrichment of splays of doorways, windows, arches and piers, of base and string-courses, of weatherings and copings, and they are introduced solely on the principle of decorating the useful.

I will first point out the necessity of these splays and weatherings, and then proceed to consider the form and application of mouldings to them.

to all; the arch mould over them is consequently splayed. This form of pier and arch mould is therefore necessary for both piers and arches.

Great increase of solidity and strength is gained by projections at the base of a building as sets-off; but were these projections left flat at top instead of being bevelled off, they would become lodgments for water.

The splayed or bevelled form is therefore necessary for base moulds. Strings and copings, the very intention of which is to throw off water, must be sloped for the same reason.



It will be readily seen that without a splay a considerable portion of light would be excluded, and that this form of jamb is necessary to the use and intention of a window.

In a doorway the convenience of splayed sides must be evident for ordinary ingress and egress. This form of jamb is therefore necessary to the use and intention of a doorway.

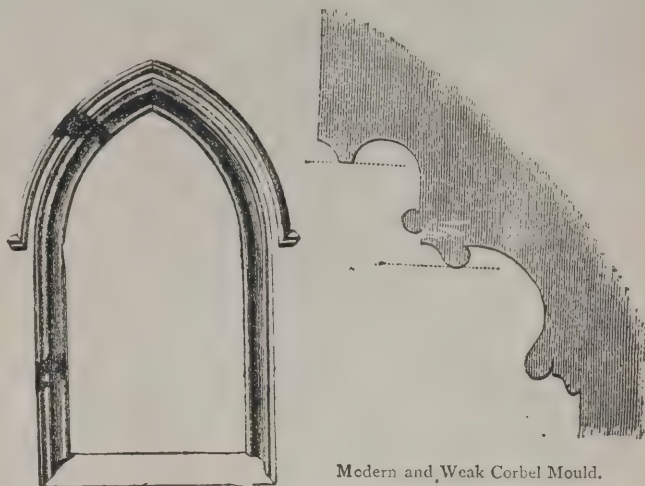
The advantage of piers splayed, or placed diagonally over square ones both for elegance and convenience, must be evident

The use of the splayed form being now demonstrated, I will proceed to consider the mouldings used to enrich it. All mouldings should be designed on the principle of light, shadow, and half tint; and the section of a moulding should be of such a form as to produce various and pleasing gradations of light and shadow. Monotony should be carefully avoided, also all cutting shadows near the outer edge, which have a meagre effect. The original splayed form should never be lost sight of

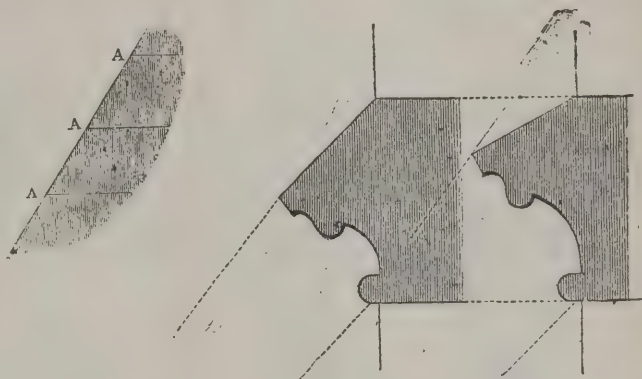
in the sinkings of the mould, which ought not to be so extravagantly deep as to produce both a real and apparent weakness in the jamb.

All the mouldings of jamb are invariably sunk from the face of the work. A projecting mould in such a situation would be a useless excrescence, and contrary to the principles of Pointed architecture, which do not admit of any unnecessary members. A hood mould projects immediately above the springing of the arch to receive the water running down the wall over the window, and convey it off on either side. This projection answers a purpose, and therefore is not only allowable but indispensable in the Pointed style; but a projection down the

the springing of arches is to receive the different moulds of jamb and arch, which could not be successfully united by any better means than foliated and moulded projections. Hence, in the later Pointed continental churches, where the same moulds run up the jambs and round the arches without interruption, caps are entirely omitted; and the same thing is observable, under similar circumstances, in the nave of Crowland Abbey, Lincolnshire.



Modern and Weak Corbel Mould.



The next class of mouldings I will notice are those belonging to base moulds, weatherings and strings. I have shown above that the bevelled form is necessary for these projections; but when the weathering is of any depth it is evident that the

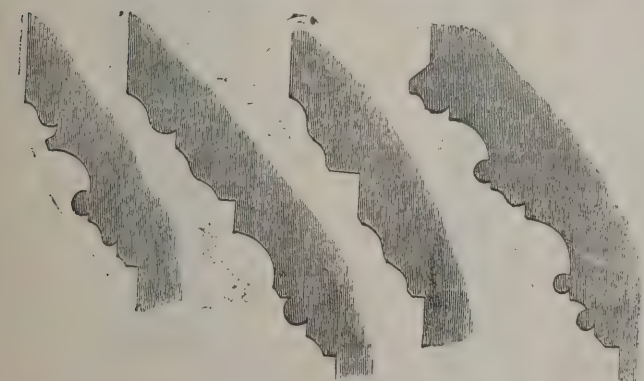


Caps at the Transition from Jamb to Arch Mould.

Examples of Ancient Jamb Moulds.



Ancient Examples of Base Moulds and Weatherings.



Ancient Profiles of Corbel Moulds.

sides of jamb, where it would be utterly useless, is never found among the monuments of antiquity.

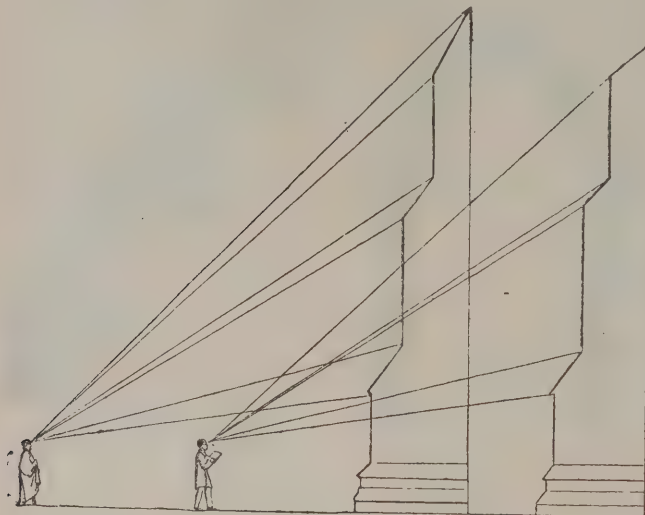
The mouldings round an arch are generally more subdivided than those of the jamb. This is carrying out the same principle that may be observed in vegetation, where the solid trunk spreads and divides as it rises upwards. The use of caps at

inclined plane cut by the horizontal joints of masonry will produce what are technically called feather-edged joints, at A A A, which would be easily broken by the action of frost,

and the joints themselves would be penetrated by water. To obviate this, all the varied and beautiful moulds of weatherings have been introduced, by the form of which the stones are strengthened at the joints, and they are protected from the action of water by the overhanging mould throwing it off to the next bevel.

These observations will apply equally to string-courses and copings.

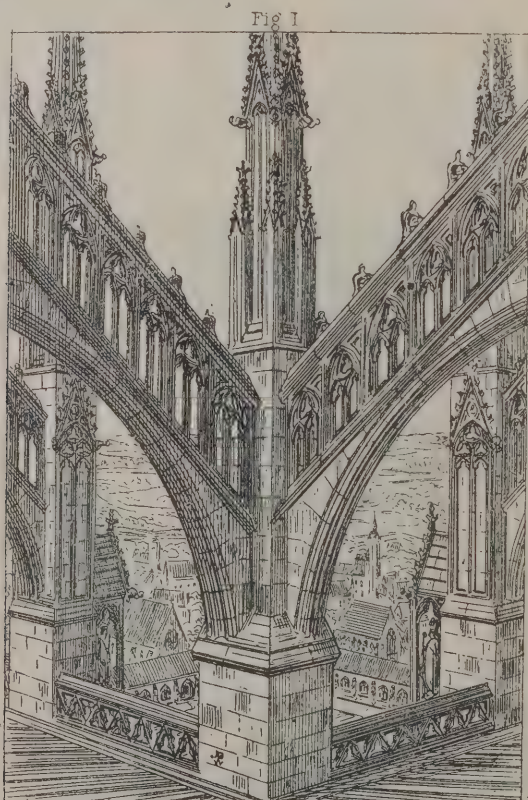
Another important consideration relative to mouldings, and by which their profile should in a great measure be regulated,



Slope of Weatherings.

is the position in which they are placed with relation to the eye of the spectator. The slope of weatherings themselves is determined by this principle, the pitch increasing with the height that they are placed from the ground. Were this not attended to, the upper water-table would be lost to a spectator, unless he was at a considerable distance from the building.

In corbel moulds the profile should be so formed as to gain projection with strength, avoiding deep hollows and unnecessary nosings.



Flying Buttresses.

The apparent width of a string-course placed above the eye depends almost as much on the top bevel as on its actual width, for string-courses of equal width, with different bevels, will vary considerably to the eye.

Every moulding in a Pointed building must be designed and shaped on these consistent principles. The severity of Christian architecture requires a reasonable purpose for the introduction of the smallest detail, and daily experience proves that those who attempt this glorious style without any fixed ideas of its unalterable rules are certain to end in miserable failures.

Another most important, but now most neglected, part of masonry is the jointing of the stones. All bond and solidity is frequently sacrificed for what is called a neat joint by setting one stone on end to form a jamb (page 29, fig. A), when the same space in good old constructions would have been occupied by five or six stones tailing into the wall, and lying in their

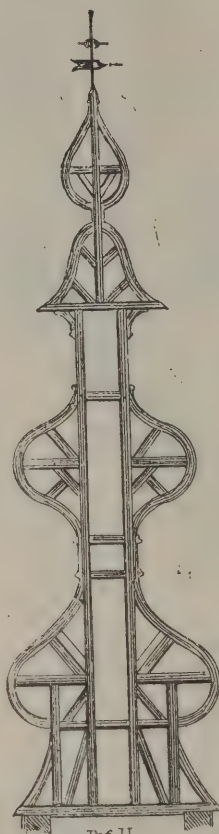


Fig II.
Bulbous Steeple.

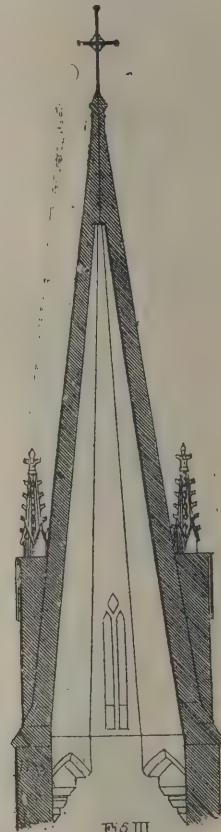


Fig III.
English Spire.

natural bed (fig. B); a point which should be most strictly attended to.

Or, if the jambs are built in courses, they are made as uniform as possible, like rustics (fig. C). By this means the effect

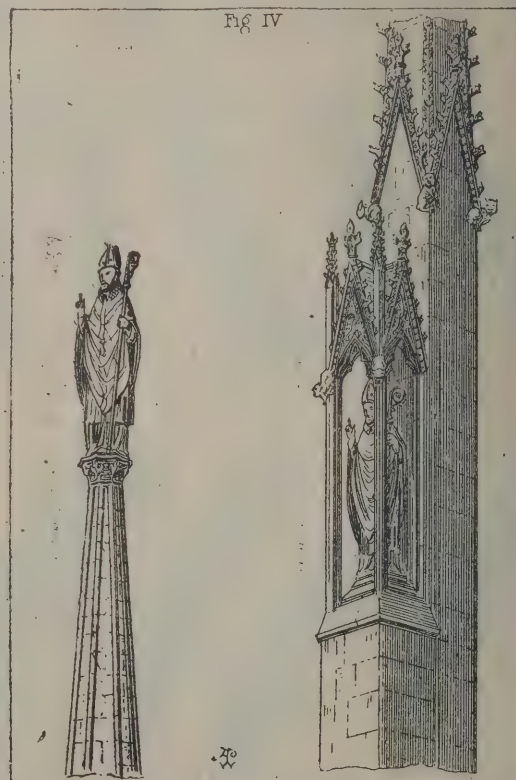


Fig IV.
Detached and Canopied Figures.

of the window is spoiled; the eye, owing to the regularity of these projections, is carried from the line of jamb to them, while in the old masonry (fig. D) the irregular outline of the stores does not interfere with the mouldings of the window.

Another point to be remarked in the ancient masonry is the smallness of the stones employed; now, independently of this

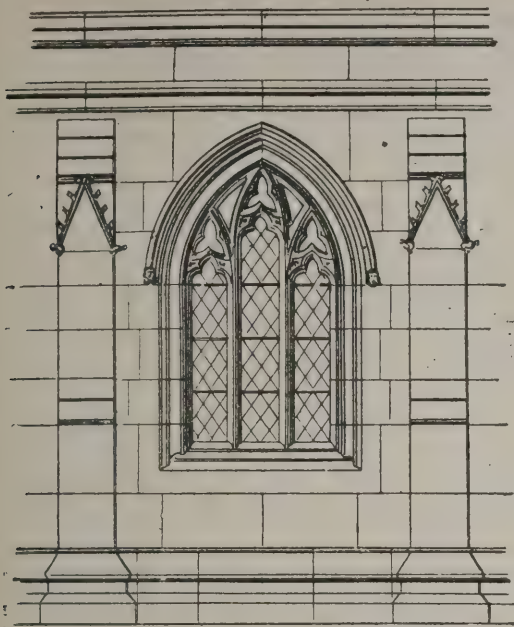


Fig. E.



Fig. F.

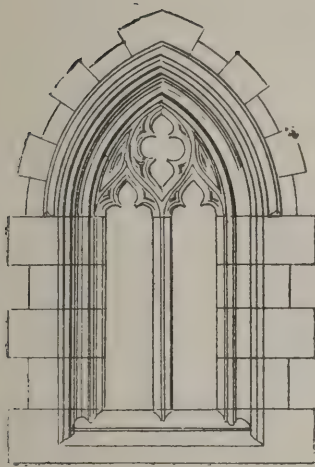


Fig. C.

MODERN REGULAR JOINTS

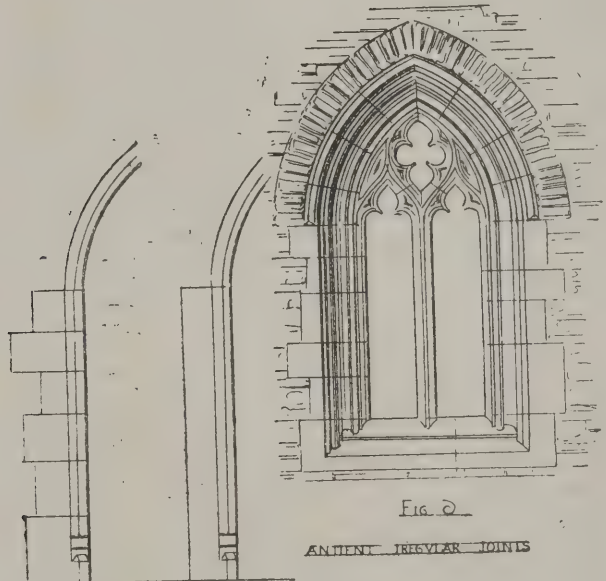


Fig. D.

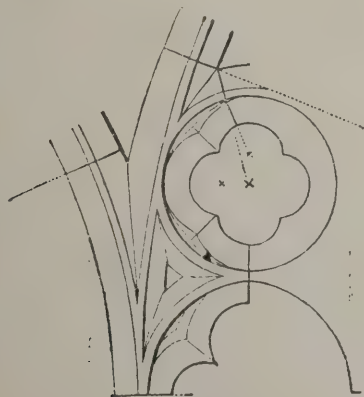
ANCIENT IRREGULAR JOINTS

Fig. B.

Fig. A.

Masonry Construction.

being the strongest mode of construction, it adds considerably to the effect of the building by increasing its apparent scale. Large stones destroy proportion, and to illustrate this I have given two representations of the same piece of architecture differently jointed (figs. E, F).



Tracery Joints.

Not only are the stones which are used in the ancient buildings exceedingly small, but they are also very irregular in size, and for the same reason as I have before mentioned, that

the jointing might not appear a regular feature, and by its lines interfere with those of the building.

In the early buildings the work was carried up in regular beds; there were as many joints in a detached pillar as in the wall, and equal space was occupied by the mortar in every part of the building. The joints of stone tracery should always be cut to the centre of the curve where they fall, and if the joint crosses three or four different curves its bed should vary with those curves, and without this is rigidly adhered to in the construction of stone tracery the work must be devoid of the necessary strength. Any of the great circular or mullioned windows of the ancient cathedrals will fully illustrate this principle.

Images in these northern countries were, with some very few exceptions, placed in niches under canopies. This is really necessary to preserve the sculpture from the injuries of weather, and it is much more consistent than leaving the venerable image of a saintly or royal personage exposed to all the pelting of the pitiless storm. Detached images surmounting buildings are characteristic of southern and Italian architecture, and are much better suited to the climate of Milan than that of England (page 28, fig. 4).

Having now, I trust, successfully shown that the ornamental parts of Pointed stone buildings are merely the decoration of their essential construction, and that the formations of mouldings and details are regulated by practical utility, I will endeavour to illustrate the same principles in ancient metal and woodwork.

(To be continued.)

ARCHÆOLOGY AND HISTORY OF THE SCILLY ISLES.

AN interesting article on the Isles of Scilly appears in the *Glasgow Herald*, by Mr. J. M. Mackinlay. He writes:—

The Isles of Scilly were known to the Phœnicians and the Romans. By the Greeks they were called Cassiterides or Tin Islands; but the name was probably applied to part of the Cornish mainland as well, for there is no reason to believe that much tin was ever got in Scilly. In the beginning of the tenth century the islands were annexed, along with the rest of Cornwall, to Saxon England by Alfred's grandson, Athelstan. No one when on a tour in the west of Cornwall should omit, if possible, to visit Scilly. The group comprises thirty-six islands, besides about one hundred islets and ledges of rock, and lies about 27 miles W.S.W. of Land's End and 40 S.W. of Penzance, that port forming their link with the rest of the world. From Land's End the islands may be seen on a clear day. During the fishing season steamers ply to and from Penzance six days a week. At other times the communication, though regular, is less frequent. The crossing is an interesting one if the absence of *mal-de-mer* can be secured. At starting the noble rock-fortress of St. Michael's Mount can be seen within the curve of Mount's Bay. Newlyn, a western suburb of Penzance, is soon passed, and then comes Mousehole, where died, in 1788, Dolly Pentreath, aged 102, famous as the last to use the ancient Cornish speech. Various headlands are successively passed, closing with Land's End, and soon the Isles are seen far off, like clouds on the sea. Hugh Town, on St. Mary's, is the goal of our voyage, and is reached in three hours and a half or so after leaving Penzance. The town has a population of about one thousand. It consists mainly of a long winding street of two-storeyed houses, with an expansion at the east end, where there is a small public garden with seats. The town is built on a narrow isthmus, having St. Mary's Pool with the pier and harbour on the one side and Porth Cressa Bay on the other. Its older and more correct name is Heugh Town—i.e. the town beside the heugh or high ground forming the Garrison Hill. The site of the town is certainly the reverse of a heugh. It is so little raised above the level of the sea that during specially boisterous weather the waves of Porth Cressa Bay have swept across the town and fallen into St. Mary's Pool. On September 26, 1744, they did so, and completely carried off a house and a limekiln, besides doing other damage. In 1755, at the time of the great earthquake at Lisbon, a slight shock was felt on St. Mary's, and the sea suddenly rose several feet. Had the day not been calm and the tide low Hugh Town might have had cause to regret the occurrence. Since then precautions have been taken, and there is now little risk of an inundation. A short but somewhat steep road leads from the town to Garrison Hill, already mentioned. In 1863 the place lost its military character, and though the batteries and a couple of guns remain, the soldiers are gone, their places being taken by coastguardsmen. The buildings also form a meteorological station, and accommodate the Board of Trade life-saving apparatus. Above the entrance still hangs the bell used formerly to ring out the hours from six in the morning till nine at night, a duty now performed by the church clock at the other end of the town. Crowning the hill is Star Castle, poetically known as Stella Mariae. Its walls have eight angular projections, making it resemble a conventional star, hence its name. It was built in the time of Elizabeth. Over its portal are the letters E.R. and the date 1593. There is a walk fully a mile in circuit round the hill, and perhaps from nowhere else can a finer view be had of the various islands of the group. The principal are these:—To the S.W. St. Agnes, to the N.W. Samson, Tresco and Bryher, and to the N.E. St. Martin's. After dusk the gleam of Bishop Lighthouse may be seen seven miles off, while nearer are the lights of St. Agnes and Round Island. St. Mary's is the largest of the group. It is nine miles in circumference, and has a population of about 1,300. Four out of the other five islands are inhabited, and have altogether a population of 700. Till about forty years ago there were some families on Samson, but to provide a better livelihood for them and a better education for the children they were removed to St. Mary's. Who that is familiar with Mr. Walter Besant's novels can fail to remember that Samson was the home of "Armored of Lyonesse?" One of its roofless cottages is pointed out as having been the dwelling of that frank and fearless Scillonian.

To return to St. Mary's, Hugh Town came into importance in the time of Elizabeth. Till then the capital of the island was the now quaint and quiet hamlet of Old Town, a mile off, where once stood the castle of Ennor, granted by Edward I. to Randolph de Blankminster, on condition that he should keep twelve armed men to maintain order, a special desideratum in those days. The islands were granted to him for an annual payment of 300 puffins, or 6s. 8d. There is a legend that in the Middle Ages, when Scilly was under the jurisdiction of the monks of Tavistock, the landing at Old Town Bay was guarded by a chain, and a toll was levied on all who disembarked. The

impost, it is said, was abolished by Richard Plantagenet, who came in disguise, and, when asked for toll, laid the friar dead at his feet. There is little doubt that the place, still called Holy Vale, near the centre of the island, had some ecclesiastical establishment, though no ruins remain to witness to the fact. It is a sheltered spot, such as monks would have chosen, and doubtless vesper and matin chants were once heard there. Now the choristers are the birds that sing among the sycamores. There are several houses in that quiet nook, and in one of them is preserved and prized a handsome old chair said to have been used in 1645 by Prince Charles, afterwards Charles II., when in the island for six weeks before taking refuge in Jersey. Between Hugh Town and Old Town is Peninis Head, the name signifying in Cornish the "head of the island." It is the most southerly point of St. Mary's, and many a billow has broken on its rocky front. There are some curiously-shaped masses of rock on the headland. These have received such fanciful names as "The Monk's Cowl," "The Pulpit Rock," &c. The Pulpit Rock has a projecting ledge above resembling a sounding-board, and from it St. Anthony might have preached to the fishes had his voice been loud enough to be a match for the winds and waves. A cavern called Piper's Hole, with a spring of fresh water in it, is, or was, believed to be connected by a submarine passage with another cave in Tresco bearing the same name. A dog is said to have gone in at the one cave and come out at the other minus almost all its hair. Two immense rocking-stones, styled here, as elsewhere in Cornwall, "Logan stones," were accidentally discovered quite lately on Peninis. The larger of the two is believed to weigh fully 300 tons, and is so delicately poised that one person can put it into motion. A little to the west of Old Town is the graveyard. Aloes and dracænas adorn the place, and in it are buried one hundred out of the three hundred who perished in the wreck of the s.s. *Schiller* on May 7, 1875. There is an old church in the graveyard, but it is now used mainly as a mortuary chapel. The present church in Hugh Town was built in 1836, principally by the late lord-proprietor. The Wesleyans and the Bible Christians—an offshoot from the Wesleyans—have also places of worship. John Wesley visited Hugh Town in 1743, and gave addresses in the street. A mile to the east of Old Town is Porth Hellick Bay, where the body of Sir Cloudesley Shovel was washed ashore in October 1707. His ship, the *Association*, and others of his fleet, were lost when returning from Toulon after the capture of Gibraltar. Two thousand perished in the catastrophe. Sir Cloudesley's body was buried in a bank close to the shore. The notion still prevails that grass will not grow over the spot. The body was afterwards removed to its final resting-place in Westminster Abbey. On the cliff to the south of Porth Hellick Bay are the ruins of an ancient stronghold styled the "Giant's Castle," with traces of ditches and ramparts, and about the same distance to the north of the bay is the "Giant's Chair," a block of stone shaped like a large arm-chair. The islands contain other objects of interest for the student of archæology, such as ancient tumuli, standing stones, &c. On Buzza Hill, near Hugh Town, are three prehistoric sepulchral mounds. Two of these were opened about 1750 by Borlase, the Cornish antiquary. A thunderstorm occurring soon after was superstitiously attributed by the islanders to the disturbance of the graves.

To visit the other islands a steam launch can be hired at St. Mary's, and from its deck ever-changing views of the picturesque rock scenery are to be had. The water is of a lovely hue, varying from a vivid green to a deep blue, and many a white beach covered with beautifully tinted shells tempts one on shore. With regard to St. Agnes, the name, as Mr. Leonard Courtney points out in "A Week in the Isles of Scilly," has really nothing to do with any saint. The name was simply Agnes, Hagenes, or Hagness. The final syllable, being the Norse "ness," a headland, is a relic of Viking occupation. St. Werna seems to have been the patron saint of the island. Close to St. Werna's Cove is her consecrated well, covered by a flat stone. It has for long been filled up with rubbish and is now neglected; but tradition says that many a pin used to be dropped into it with a prayer to the saint to send a rich wreck. At one time, indeed, wrecking was quite common among the islands. On dark and stormy nights cows were driven to the beach with lanterns hung between their horns to lure mariners to destruction by the false lights. The following affords a pleasing contrast:—In 1685 a French vessel struck on the rocks, and instead of pillaging it the St. Agnes people took it in safety to St. Mary's. The money received as salvage was unanimously devoted by the islanders to the erection of a church, as there was then no place of worship on St. Agnes. It was erected beside Priglis Bay, where its successor, built some fifty years ago, still stands. Priglis in Cornish means the "church port" or bay, and one may infer from the name that a church or chapel stood there long before 1685, dedicated probably to the patron saint of the island. Divided from St. Agnes by the narrow channel known as Smith's Sound is Annet, otherwise called Bird Island, a very appropriate name. Multitudes of puffins are to be seen here. They build their nests under

ground, and the surface is so honeycombed that walking requires care to prevent a sprained ankle. The island contains about forty acres, covered with grass and boulders. Sea-pinks abound, and in the summer months the glow of the flowers is seen from afar. On none of the islands are visitors more likely to land than on Tresco, at one time called also St. Nicholas Island. Here beside the ruins of St. Nicholas's Abbey Church stands the lord-proprietor's mansion, surrounded by its famous gardens, where sub-tropical trees and shrubs grow in the open air along with those of a temperate climate. The cultivation of such would be impossible even in Scilly, where the winters are mild, were it not for the high hedges, mainly of the red-flowering *escalonias*, planted to break the force of the wind. Through the courtesy of the proprietor visitors are shown over the gardens. The head-gardener who acts as guide gives much interesting information, and points out the plants brought from such widely-separated lands as South America, Australia, New Zealand and the Cape. The gardens were laid out sixty years ago and extend to ten acres. At the end of one of the alleys is a "cresset" from St. Agnes, formerly in use there as a beacon. It was once filled with blazing coal. In summer it is now filled with a blaze of scarlet geraniums. Just inside the entrance to the gardens is a weird gallery of figure-heads, twenty-six in number, taken mainly from vessels wrecked from time to time on the islands. In another part of the gardens stands in an upright position a stone 4 feet in height, 2 in breadth and $\frac{1}{2}$ a foot in thickness. It has two perforations one above another, sufficiently large to allow the hand to pass through. This stone may have been anciently used for plighting vows, the hands of the engaging parties being thrust through the holes. If this was so the stone belongs to the same class of antiquities as the once revered Stone of Odin at Stennis in Orkney, destroyed eighty years ago, through a hole in which hands were clasped in connection with what was styled the promise of Odin. In his "Guide to the Isles of Scilly," Mr. J. G. Tonkin mentions that the Tresco stone was dug up in 1881 near the ruins of the Abbey Church. The nave of this church was used for burials till the early part of the present century. Troutbeck mentions that in his time, circa 1790, it was held in such veneration that the islanders would not bury their dead anywhere else. A proposal was then made to form a graveyard beside the church in the village fully a mile away; but the villagers objected on the ground that if there were graves beside their houses they might be haunted by the ghosts of the departed. There is now a neatly-kept graveyard at the village church, but, as far as we know, there are no ghosts. Perhaps, like the witches formerly seen on the island, the ghosts have faded into the light of common day. The village where the church stands is called Dolphin Town, a corruption of Godolphin Town, so called after the Godolphin family, who, with the exception of a short break in the seventeenth century, were lessees of the islands from 1539 till 1785, their successor being the Duke of Leeds till 1831. The islands form part of the Duchy of Cornwall. The present lord-proprietor is Colonel Dorien-Smith, who carries on the traditions of his uncle, the late Mr. Augustus Smith, M.P., than whom no one has done more for the prosperity of the Scillonians. The present proprietor, when in residence in Scilly, crosses to Star Castle once a week to attend to the affairs of his tenants. His steward lives in the castle, and there is telephonic communication between it and the mansion-house at the Abbey. Near the mansion-house are two large pools of fresh water, forming a pleasing feature in the scenery of the island. Before leaving Tresco the visitor interested in military antiquities should see the remains of Charles's Castle, on a hill 150 feet high, and Cromwell's Castle at a lower level. The latter, 60 feet in height, was named after the Protector, though not built by him. The islands held out for the King, but after a stout resistance were compelled to submit to the Parliament.

At one time much gain came to the Scillonians through pilotage, and through the less legitimate channel of smuggling. Kelp made from seaweed was largely exported from the islands. Its manufacture is now discontinued. Shipbuilding was quite a prosperous industry on St. Mary's between 1840 and 1864, but it has now reached a vanishing point. From the beginning of May till midsummer the mackerel fishing is at its height, and there is often quite a lively scene on Hugh Town Pier when the fish caught through the nets are auctioned before being transferred to the Penzance steamer. It is a picturesque sight, dear to the heart of an artist, to see the fishing fleet, numbering perhaps a couple of hundred, leaving St. Mary's Pool for their distant fishing-ground, the glory of the setting sun kindling on their sails. Hardly any of the boats belong to Scilly. They are mostly from Penzance, but some come from as far as Lowestoft and Yarmouth. With regard to the commissariat of Scilly, a rhyme says—

Scads and 'tates, scads and 'tates,
Scads and 'tates and conger,
And those who can't eat scads and 'tates—
Oh! they must die of hunger.

This may have been true at one time. It is certainly not so at present. The scad, otherwise known as the horse mackerel, is now little esteemed by the Scillonians. The 'tates, *i.e.* potatoes, are cultivated largely for the London market along with tomatoes and other early vegetables. There are two kinds of conger, the white and the black, the one being caught on sand and the other on rock. According to one etymology the islands derived their names from this fish, *sylla* signifying in Cornish a conger eel, hence Scilly. Another etymology supposes the root to be *scylly*, to separate, pointing to the separation caused by the sinking beneath the sea of the fabled land of Lyonesse between Scilly and the Land's End. As readers of Tennyson know, tradition connected this land with King Arthur. It is at any rate curious that two rocks of the group are called respectively Great and Little Arthur. Scilly, the barren islet giving name to the archipelago, lies to the north-west of the other islands. It may more correctly be described as two islets divided from one another by a narrow channel, through which the sea flows. Troutbeck says "there is reason to believe, from the situation of the shores, that this island, which is now only a bare rock, was formerly joined to the others by low necks of land, and that the adjoining rocks and islets made formerly but one island, which obtained the name of Scilly." He thinks this is proved by the discovery of certain architectural remains beneath the sand, and holds that after the islands became separate each received a name, the chief being called after particular saints; but that Scilly, being uninhabitable, retained its ancient name. It is an interesting fact that at the ebb of spring tides a crossing may still be made dryshod between Tresco and Bryher.

Great changes have occurred in Scilly since the time when there was a whipping-post in the street of Hugh Town, when evil-doers were ducked in the sea at the pier-head, and when felons were left on a rock with bread and water till the tide drowned them. As a matter of fact, there are no felons now in Scilly. There are magistrates and one policeman in Hugh Town, but their work is of the lightest. Stealing some hens was lately the only offence committed during a whole year. Some old customs have disappeared within comparatively recent times. Goose-dancing, *i.e.* masquerading at Christmas, once popular, is now out of fashion. Other recreations at Easter and Whitsuntide have shared the same fate; whilst harvest rejoicings, once an important feature in the social life of the Scillonians, are now reduced to a minimum. One thinks with regret of the disappearance of the Maypole only within the last two or three years, though the May Queen is still crowned with considerable ceremony in the street of Hugh Town.

THE CHETHAM SOCIETY.

THE following is the report submitted at the annual meeting of this Society, held in the audit-room of Chetham's Hospital. The president, Mr. R. C. Christie, occupied the chair:—

During the past year, the fifty-first of the Chetham Society's existence, three volumes have been issued to the members, the two first parts of "The Poems of John Byrom," edited by Dr. Ward, and the second part of the "Chartulary of the Priory of Lancaster," edited by Mr. W. O. Roper. (These three volumes form the second for 1892-93 and the two for 1893-94.) A complete edition of the poems of John Byrom, giving an accurate text, with adequate introductions and notes, was one of the works contemplated on the foundation of the Society, and was an undertaking which Manchester certainly owed to the memory of the single eminent man of letters before the commencement of the present century whose name has been inseparably connected with that of his native city, and whose verses, if they never rise to poetry of the highest order, are characterised by good taste and good sense, accompanied by considerable power of versification, sometimes, indeed, as Dr. Ward remarks, by "a fatal facility" of versification. But Byrom is not only a local worthy. There is probably none among the minor poets of the seventeenth century whose epigrams are so frequently quoted, or who has left a Christmas hymn which is still so popular. In the two volumes which have been already issued Dr. Ward has given for the first time a scholarly and critical edition of the secular poems, with a revised and corrected text, and introductions and notes, clearing up and explaining the numerous local and often obscure allusions which make them in the old editions often so difficult, sometimes impossible, to understand. It is hoped that two more volumes, completing the work and including extracts from the unpublished Commonplace Book of Byrom—some of them of much interest—will be ready during the present year. The second volume of the Chartulary of Lancaster is not of less importance than the first. It throws a flood of light on persons and places in North Lancashire during the thirteenth and fourteenth centuries, and will be found to contain more varied matter of value, especially to Lancashire historians and genealogists, than either the Chartulary of Whalley or that of Furness. The utility of the volume, like that of its

predecessor, is much enhanced by the translation which Mr. Roper has added. A third volume of "Materials for the History of the Church of Lancaster" may shortly be expected. The council are glad to state that Canon Atkinson has undertaken to edit the late Sir Stephen Glynne's "Notes on the Churches of Cheshire." The work proceeds on the same lines as the "Notes on the Churches of Lancashire," and the information it contains with respect to the church buildings, monuments, &c., in Sir Stephen's time and at the present date is certainly as interesting as that furnished in the former volume. The printing of it is completed, and it will be very shortly in the hands of the members. It forms the first volume for 1894-95. The manuscript of Colonel Fishwick's edition of the "Note Book of Thomas Jolly," to which reference was made last year, is now in the printer's hands. The council much regret that Mr. Joseph Hall has found that his engagements will not admit of his editing the "Visitationes exemptæ jurisdictionis Abbatis et Conventus Beatæ Mariæ Virginis de Whalley." The council is most anxious to find some other competent and willing editor, but has not yet succeeded in doing so. The work is one of the highest interest, and of general as well as local importance, not less so, indeed, than the visitations of several other abbeys which have recently been published. During the past year the Society has lost by death seven members, including one of the original founders of the Society, Mr. James Frederick Beever, who for many years took much interest in the work of the Society, and was a regular attendant at its meetings. Although a considerable number of new members have been elected, bringing up the list to 256 names, this is much less than ought to be the case, and the income of the Society is altogether inadequate to its needs. Unless the number of members is increased to 350, it will be impossible for the council to do more than issue two volumes annually. Nor will it be possible to allow of payment being made for transcripts, and the efficiency of the Society will be thus greatly diminished. The following further works are in progress:—"The Minutes of the Bury and Bolton Presbyterian Classes," by Mr. W. A. Shaw, M.A.; "The Life of Humphrey Chetham," by Mr. C. W. Sutton; "The Lancashire Recusants of 1716: being a True List of the Names of those convicted as Popish Recusants at the several Quarter Sessions within the County Palatine of Lancaster," by Mr. Joseph Gillow; "Lancashire and Cheshire Wills, Third Collection," by Mr. J. P. Earwaker, M.A., F.S.A.; "History of the Chapelry of Newton," by the Rev. Ernest F. Letts, M.A.; "History of the Chapelry of Stretford," by Mr. H. T. Crofton.

COLLEGE OF MASONS.

THERE was a meeting of the members of the College of Masons in the hall of the R.I.B.A., 9 Conduit Street, last Monday evening, under the presidency of Sir Arthur Blomfield, to consider the means of continuing the classes of masonry and the College of Masons after the departure of Mr. Lawrence Harvey. After a few words from Sir Arthur Blomfield explaining the object of the meeting, Mr. Harvey gave a short account of the history of the classes of masonry. They were begun in 1886 at the instigation of the Architectural Association. In the following year a classroom was fitted up for them at the Guilds Central Institute, South Kensington, and several practical masons joined, taking their instruction sitting side by side with the architects, a fact which Mr. Harvey considered as very beneficial to both parties, this mixing of the cream of the working classes with young professionals tending to remove prejudices and engender mutual respect. The advantages of the study of masonry were in Mr. Harvey's opinion principally educational; they exercised the mind to conceive forms in space which the eye did not see, and it strengthened the reasoning powers by the application of general principles to the solution of each individual problem. It did for the architect exactly what the study of Greek and Latin did for the man of letters—it strengthened his mind in the very powers which he required.

A letter was received from Mr. Sydney Webb, chairman of the London County Council technical education committee, in which he referred to the technical classes in the various polytechnics, especially at Battersea, as places to obtain the required instruction in case the classes of the Guilds Institute were discontinued.

To this Mr. Johnson, stonemason, answered by saying that he had attended several art schools, and had always found the instruction given there of little practical use. The thing which workmen wanted were classes exactly like those held by Mr. Harvey, and they were to be obtained nowhere else than at the Guilds Institute. All the workmen present supported that view. Mr. Cates, F.R.I.B.A., then said that what must be done is to educate the authorities of the Guilds Institute, the London County Council, and other public bodies, that the science of masonry was not the elementary and unpractical stuff taught

in the various polytechnics, but was a science of a high order, of great educational value to workmen and professionals, and that it was a question of national importance to maintain the classes of masonry. It was then decided to memorialise the Council of the City and Guilds of London Institute to provide another instructor to continue the classes exactly on the same lines as Mr. Harvey had followed.



The Cost of Working an Electric Elevator.

SIR,—Possibly the following figures derived from actual practice of the cost of operation of an electrically driven passenger elevator may be of interest to your readers. The elevator in question was erected under my supervision for Mr. E. D. Stern, at 4 Carlton House Terrace, at the commencement of the present year, the contractors for the work being the Otis Elevator Company. The elevator itself is fitted with a 600 lbs. car, having a rise of 40 feet and designed to work at the rate of 60 feet per minute, and is fitted with all the latest improvements in regard to self-acting safety appliances. It is operated from within by a simple regulating switch, which can be worked quite well by a woman or child, and everything has so far given great satisfaction. The current is supplied from the mains of the local supply company, whose invoice for the last quarter lies before me, the cost of current for working during the last three months amounting to the sum of 9s. 2d., during which time the lift has been in regular use, the number of trips being probably about 400, the cost of an average journey amounting to from one farthing to one-third of a penny, according to load.—Yours truly,

MORGAN J. M. WILLIAMS, M.A., Assoc.M.I.C.E.

GENERAL.

A Grant of 200*l.* has been made to the British School, Athens, from the Royal Bounty Fund.

St. George's Church, Wigan, has been closed for the summer months, owing to alleged unsatisfactory sanitary arrangements surrounding the church.

A Donation of 500*l.* has been received from Mr. George Hanbury for the building fund of the Paddington Green Children's Hospital. About 4,000*l.* is required to complete and open the hospital.

The Death is announced of Professor August Dillmann, of the Berlin University, aged seventy-one. He was well-known in England as the author of the catalogues of the Ethiopian manuscripts in the British Museum and the Bodleian Library.

In Algeria, on the site of the ancient Roman town of Thamugadis, now known as Timgad, portions of a colossal statue, the height of which is estimated to have been no less than nine yards, have been found.

The Royal Society of Antiquaries of Ireland, by invitation of the Cambrian Archaeological Association, will open their annual general meeting at Carnarvon on Monday, the 16th inst., under the presidency of Mr. Thomas Drew, R.H.A., P.R.I.A.I.

The Rubens Picture, *A Boar Hunt*, has just been purchased for the Glasgow Corporation, and placed in the Corporation Galleries. The work is a large one, measuring 4 by 5 feet, and shows a number of men and dogs making an attack upon a wild boar in a forest. The price paid for the work was 1,660*l.*

Sir Joshua Reynolds's Picture, *Lady Betty Deline*, has, it is stated, been purchased for Baron Rothschild for 11,000 guineas.

The Northern Architectural Association have decided to hold their annual excursion at Thirsk, Rievaulx and neighbourhood on Saturday, July 21.

The "Old Glasgow" Exhibition, which has been arranged in the Fine Art Galleries, Sauciehall Street, has been formally opened by Lord Provost Bell, in presence of a large company.

The "Standard" correspondent at St. Petersburg says:—After a long contest, which has lasted nearly three years, the contract for the construction of the new Trinity Bridge over the Neva, in place of the movable wooden one, has been secured by the French company at Batignolles, the most dangerous competitor being also French, M. Eiffel. The bridge is to cost 5,800,000 roubles. No English firms appear to have tendered for this valuable piece of work.

The Architect.

THE WEEK.

THE decision which was given by Mr. Justice MATHEW in *BURT and Others v. BULL and WARD* on Monday should be a warning to all who undertake the management of builders' estates on behalf of creditors. The defendants had been appointed as receivers and managers of the business of BULL, SONS & Co., Limited. Among the works were some unfinished contracts with the London School Board. There was an order for timber of the value of 100*l.* given to the plaintiffs, which was signed by defendants as "receivers and managers." It was contended that the plaintiffs could not be held liable beyond the extent of the funds at their disposal, and, moreover, because they were acting as officers of the court. In his evidence, however, Mr. WARD admitted that he lately applied to the court for permission to dispose of some of the property of the company, on the ground that he was personally liable. His lordship held that the appointment could have been made in a way by which the defendants became exempted, but under the circumstances he believed the defendants had the intention to assume liability, and, therefore, judgment must be given for the plaintiffs. From the decision it would appear as if anyone in the position of plaintiffs were not bound to inquire with whom the dealing takes place.

THE death of Mr. WILLIAM JACKSON, the Leicester architect, on a date that is uncertain, was a lonely ending to a lonely life. For twenty years he lived alone in a house in London Road. He was last seen on the evening of June 28, when he was occupied in his garden. On Wednesday in last week a neighbour, being convinced that something unusual had occurred, climbed to the bedroom window and observed a body lying on the bed in a condition that made identification impossible. The surgeon who made the post-mortem examination could state was that the remains belonged to a man of Mr. JACKSON's physique. There were no signs of violence, but as there was not sufficient evidence of the cause of death, the jury returned an open verdict. Mr. JACKSON was the author of occasional essays, mainly on archaeological subjects. The books found near his bed indicated the current of his thoughts during his last day on earth. They consisted of a Prayer-book, three volumes of SHAKESPEARE, a volume of DANTE, another by MATTHEW ARNOLD, and CARLYLE'S "Sartor Resartus."

It takes a long time to convince people, and especially those who exercise a little brief authority, that parliamentary draughtsmen, when drawing Bills, assume that a spirit of equity will always moderate the universality of application, which, owing to the imperfection of language, seems to be implied in the terms employed in expressing the clauses. There must be, as MACBETH says, "particular addition from the bill that writes them all alike." Of houses, there are, for instance, many varieties, from palaces to dolls' houses, having many properties in common, but it would be carrying logic too far to assert that they must equally submit to the Building Acts. Yet the London County Council appear to have resolved that the regulations are to be enforced in whatever can be designated as a house. They have already experimented with builders' pay-boxes, photographers' show-cases and similar examples of construction. On Monday it was the turn of a specimen of a corrugated iron bungalow that was not used on occasions by a pay-clerk, and did not afford shelter to photographs or anything organic or inorganic. The bungalow rested on the ground at Knightsbridge, but it might as well have been suspended in the air by chains from a crane. When the owners were summoned the magistrate considered the structure to be a specimen of wares, and dismissed the summons. If he could have treated it as an eyesore which was out of place in the vicinity of Hyde Park, his conduct would merit the approval of the neighbourhood. But as regards risk to the Metropolis, the dogs' houses of matting, wicker or wood which are exposed in shops are more dangerous, for they can be easily ignited. The

Council appealed, and the case was heard on Monday before Mr. Justice WILLS and Mr. Justice KENNEDY. Their lordships agreed that there could not be a general rule which comprised all varieties of structures. One expressed the fact by saying that it would be very difficult to formulate a definition; the other said it was impossible to draw a logical line. Both, however, applied the test of use. The corrugated bungalow was not intended for habitation at Knightsbridge; it was merely exhibited with a view to removal whenever a purchaser was attracted, and being part of a manufacturer's stock it could not be treated as a building. The decision has interest, but we hope it will subdue the ardour of the London County Council to apply the Building Acts to purposes which were not contemplated by the legislature.

AN united meeting of the Cambrian Archaeological Association and the Royal Society of Antiquaries of Ireland has been held this week in Carnarvon. Lord PENRHYN, the president of the meeting, in the course of his address spoke upon the advisability of preserving many ancient monuments on the actual site of their historical existence. If Roman milestones were discovered let them be preserved where they were originally placed by those who at the time were the pioneers of the world. They would then form not only a public attraction to the neighbourhoods, but also object lessons of long standing, and draw attention in the minds of beginners to the study of archaeology, in which they were all interested, whereas if they were, as was sometimes done, moved to the museum or to a private dwelling they lost the charm of the story that they could tell to anyone who cared to read it. A relic of that kind standing by the roadside on what was now a lonely mountain path, seldom traversed by ought save sheep and shepherds, would tell of the legions and centurions who tramped by it, and brought civilisation from afar in days when Wales was, save for those Roman roads, a wilderness of woods, mountains and wolves. Lord PENRHYN earnestly invited the Cambrian Society to use its influence in the direction of securing the restoration to their original sites of any such relics of antiquity as they might learn had been buried in what seemed a useless manner.

A MEETING of the School Board of Liverpool was held on Monday to consider the subject of the proposed offices. The Chairman moved that Messrs. BRADBURY, DEACON, KIRBY, and READE be invited to send in plans in competition. An amendment, proposing that all Liverpool architects should be allowed to compete, was lost by one vote. Another amendment, which recommended the postponement of a decision until November, was rejected. The Chairman's motion was subsequently carried by a majority of four votes.

AN exhibition of works by "the Cornish Brotherhoods" will be held in the Castle Museum Galleries, Nottingham, during the autumn. The committee having authorised the art director, Mr. WALLIS, to form a special collection of pictures by painters who form the Brotherhoods of Newlyn and St. Ives, &c., he has been fortunate in obtaining the loan of important pictures from private owners and public collections, as well as from the artists themselves. From Newlyn come works by Mr. STANHOPE FORBES, A.R.A., Mr. FRANK BRAMLEY, A.R.A., Mrs. STANHOPE FORBES, Messrs. CHEVALIER TAYLER, T. C. GOTCH, FRED HALL, WALTER LANGLEY, R.I., &c. The St. Ives school will be exemplified by works from Mr. ADRIAN STOKES, Mrs. ADRIAN STOKES, Messrs. H. H. ROBINSON, W. H. Y. TITCOMB, R.B.A., ARNESBY BROWN, JULIUS OELSON, &c. Mr. NAPIER HEMY and Mr. H. S. TUKE will represent Falmouth, and Mr. ALFRED EAST Lelant.

THE Belgian society of artists known as the "Union des arts décoratifs" has been reorganised in order that more aid may be rendered to various industries. Henceforth membership will not be confined to artists. Manufacturers, writers, lecturers and others who may claim to be associated in some way with industrial art will be eligible for admission into the Union. The principal reason for the change is that the committee hope to organise exhibitions on a grander scale.

INDIVIDUALISM vs. COLLECTIVISM IN ART.*

NOT a few minds will be exercised to discover even a remote connection between a pseudo-historical romance and the subjects to the consideration of which this journal is devoted. That the *motif* of such a work, whether political or economic, can be made to present points of contact with either graphic, plastic, decorative or constructive art will appear a fact hard to understand. It is a difficulty, however, that becomes less apparent after a glance at the contents of the little book by Mr. F. W. HAYES, the artist, and disappears during a careful perusal of some of the chapters, especially those numbered XXVII. and XXXI.

With the main lines of the "story" we have, of course, nothing to do in the way of criticism. It is easier to create Utopias than to plan a convenient cottage. Once let the premises be granted, as has to be done when we wish to enjoy the travels in Lilliput, Brobdingnag and the Flying Island, and the reader will admit that Mr. HAYES has evolved a plausible case to support his supposition that a substitution of national co-operation for the existing competitive commercialism may come upon us at no distant date. So many changes have taken place from time to time, or are now being accomplished within social and political circles, an imaginative man can easily find pleasure in attempting to indicate what will be the remote effects of the new modifications. The adoption of an eight-hour day in Government workshops, and the direct employment of labour by representative bodies, are merely the realisation of projects which a few years ago were regarded as wild and hopeless dreams. The possibilities of yesterday have become the probabilities of to-day. We live amidst a whirling of elements that were once supposed to be stable, and the most prudent, in attempting to interpret the signs of the times, must hesitate to predict in what form they will coalesce on to-morrow. Happily it is not our office to make the attempt. Why we draw attention to "The Great Revolution of 1905" is that several of the results which are postulated in Mr. HAYES's pages as following the immense social and industrial changes affect very closely the status of the fine arts in the dim future, and some, at any rate, of our readers may feel an interest in the prospect which is offered for consideration.

The "Phalanx," it may be mentioned, is a society in which the principle of associated industry is adopted, or one of FOURIER's phalansteries on a scale that is almost beyond the aspirations of the late CÉSAR DALY. It is taken for granted that the principle has obtained such general recognition as to compel the Sovereign to invite the President of the Phalanx to undertake the formation of a Cabinet as the only way to escape in a great crisis. The enthusiasm was unparalleled and one effect of the innovation was the breaking up of party traditions. One of the first Bills introduced provided "that no example of artistic handicraft, and no picture, statue, or work of art of any kind, not already foreign property, should be conveyed out of the country without the permission of a special committee (to be called the Archaeological Council of the Department of Science and Art), that no object of decorative, historical or archaeological interest should be removed from its existing place without the permission of the same Council; and that no tree over twenty years old should be cut down without the permission of a special committee of the Woods and Forests Office." The Bill became an Act in the course of a couple of days, "just in time to prevent a furiously anti-Phalanx public-house owner in Liverpool from selling his collection of 'Rossetti's' to a Chicago hog-millionaire." No less despatch was exercised with other measures, and the constitution was transformed with less friction than commonly arises in the proceedings of the parochial parliaments where the game of legislation has supplanted billiards and whist. One of the results was that "the rush of building operations both of construction and alteration all over the country was without precedent." The success attained by the new power in the State excited the desire of the people for

further interference, and construction committees were accordingly formed who, unlike the buildings-acts and by-laws committees of our time, were able to reform the ways of architects and builders as well as building owners:—

The question of the architectural design of all new structures, whether for public or private use, was one in connection with which the central board exercised for years the most urgent and continuous pressure upon the local authorities. The desire to encourage variety and artistic originality led, in some places, to the somewhat severe regulation that no two residences within sight of each other should present the same design of elevation, while the modern system of laying out the roads of residential property in curved lines was initiated quite early in the new *régime*. The construction committees were called upon to provide everywhere for periodical exhibitions of designs for houses, shops and other required structures, and for schemes and details of decoration in connection with the local schools of art, while it was urged that the freest possible use of the more successful examples should be made by the officials. . . . In a different direction a very valuable service to art and to archaeology was rendered by the strenuous and elaborate care taken to preserve and to rehabilitate all the really old and artistic buildings throughout the country, down to the smallest ancient cottages. Nothing could of course repair the vandalism of the previous years, during which numbers of Jacobean and Elizabethan buildings of great beauty and unimpaired soundness had been ruthlessly destroyed by the speculative builder all over the land. But enough remained to hand down the tradition of the most charming domestic architecture the world has ever seen, and to prove to later generations that in past centuries the constructive art in Great Britain had reached a point of artistic excellence and of structural fitness which our descendants will find a difficulty in approaching and can scarcely hope to surpass.

As Mr. HAYES is a painter, he does not forget the advantages which his own art is supposed to have gained from the ameliorated condition which followed the acceptance of the principle that collectivism was the natural law of the world. A National Council of Arts was formed, consisting of forty members, to grant diplomas which "relieved the holder from the obligation to industrial service, and entitled him to full credit allowance, on condition that the normal hours of work should be devoted to the following of his avocation for the exclusive benefit of the State." We are to suppose that the change worked wonders:—

A stimulus, hitherto unknown and impossible, was afforded to the development of individual aptitude and genius the moment the destructive coercion of market demand, fads of fashion and dealers' insistence on mere manufactures, no longer compelled men to paint not what they wished but what they could sell. Artists could now abandon the production of toy pictures, mere knickknacks of art and adjuncts to upholstery, and devote themselves to works of gallery dimensions if their qualifications suggested such a course. Originality, hitherto systematically stamped out by the dealers as being confusing to their customers (who could only understand what they were accustomed to), now for the first time had full play. The opportunity for publicity, hitherto becoming every year more and more difficult, if not impossible, to those outside the ruling *cliques* of exhibitions, was now open to all with absolute equality. The fame usually so dear to all engaged in the practice of art was brought within the reach of everyone who could legitimately aspire to it.

The indirect results of the emancipation of art from individualist trammels, immense as they eventually became, can only be briefly touched on here. One of the most conspicuous social changes effected by the inauguration of collectivism being the equality of income and the publicity attendant thereon, the old motives for vulgar ostentation in furniture, apparel, hospitality, &c., and the reliance on mere cost to impress the beholder ceased to exist. Everybody knew to a farthing every other person's income, even that of compensates, and any affectation of superiority in anything but culture or ability became practically useless. The result was that as ability could neither be possessed or imitated at will, culture, and especially art culture (as the most easily affected by those destitute of both), became the standard by which social status was differentiated. People of pretension began to agree with one accord that homes were nothing if not artistic, that everything which could be made by hand rather than manufactured by the million ought to be hand-made, that mechanical repetition of design was vulgar, that no two things ought to be alike, that mere cost was nothing and artistic beauty everything, and so forth. This of course was the mere fashion of the day, selected because most other aspects of fashion were extinguished. But it had the enormous advantage of being a correct, true and priceless one, and what was largely an hypocrisy with the generation of 1905 became a virtue and an instinct with its successor from mere force of education and habit. Hence the resuscitation of all the splendid arts and lost crafts of the Middle Ages which has been so conspicuous a feature of the last quarter of a century, and which has given us the tapestry, the wood-carving, the hammered metal-work, the sculpture, the stained-glass, the furniture and the embroidery of our forefathers, all undefiled by the mould and the machine which had been the joy and adoration of the nineteenth-century "philistine" individualists.

A very short experience of the new *régime* indicated the imminence of a revolution in British art following on its introduction. Never before had there appeared such examples of ambitious (and successfully

* *The Great Revolution of 1905; or, The Story of the Phalanx.* With an Introductory Account of Civilisation in Great Britain at the close of the Nineteenth Century. By Frederick W. Hayes. London: R. Forder.

ambitious effort. The diversion of the whole output of the artistic profession into public channels (with the exception of course of such extra work as artists might execute in their leisure for their friends, or to exchange with brother artists, &c.) not only stimulated a generous rivalry amongst painters and sculptors, but enormously developed the popular interest in and enjoyment of art, while incidentally the artist as an individual began to acquire the status and prestige previously accorded to his contemporary and predecessor in France and Mediæval Italy.

Mr. HAYES in his pages looks behind as well as before, and in contrast with the happy time for artists he has described, he takes a retrospective glance at the condition of his art at the close of the nineteenth century, when the individualist principle prevailed. It cannot be objected to the following bitter remarks that they are the product of imagination alone:—

It may be safely said that down to the period under discussion scarcely any class had suffered so fatally from the curse of individualism as that concerned in the production of works of art. To all but a mere handful of artists, professional success depended on the accident of being patronised by a wealthy collector, on fighting, intriguing, or toadying for admission into one or more of the "close" societies, on being "farmed" by an influential dealer, on manufacturing continuously identical subjects and effects for "the trade," or on pandering to the vanity of women and parvenus as a fashionable portrait painter. A very limited amount of picture buying by municipalities for public galleries (probably a five-hundredth part of the sum similarly expended in France) was certainly carried on. But this was wholly controlled by small cliques of ignorant connoisseurs and prejudiced patrons, whose blunders, jobbery and favouritism were more injurious to art than total neglect would have been. Sculpture scarcely existed save in the shape of portrait busts, and the only branch of art really popularised (because supported by the whole community and not by a few plutocrats) was that of engraving and etching. An artist's only mode of access to the public was through the grotesquely insufficient medium of half a dozen fashionable exhibitions in London, the property of certain self-elected members. The list of one set of these artist-proprietors frequently coincided to a large extent with that of the others; while their whole aim was to make these concerns paying shops for themselves and their friends, and to direct the stream of art patronage, as far as possible, into their own galleries. The great dealers, making the larger portion of their profits out of single transactions at inflated prices, strained every nerve to keep down the number of the artists in whose works they found it convenient to traffic. This was for the all-sufficient reason that they had to depend upon the bribe of a paying investment to induce their plutocrat customers to buy, and were consequently obliged, for their own safety, to see that the works they sold did not fall in value at the sales of the leading art-auctioneers of the day. They therefore had a direct interest in having as few fancy reputations to bolster up as possible. In the meantime the Government Schools of Art (originally founded to enable artisan craftsmen, by means of an artistic training, to compete under fewer disadvantages with their French rivals) had been used almost solely by young amateurs of the middle classes, who flooded the market with their studies of still life, draped studio models and landscapes in imitation of fourth-rate continental artists.

It is fancied that as soon as all "business" (*i.e.* the mere handling of wealth and its products for the sake of commission or middleman's profits) becomes extinct, nearly the whole of the present machinery of distribution will be rendered useless. Miles of shops and huge blocks of warehouses and offices will then for the most part be features only of the past, their places having been taken by buildings more suggestive of national contentment in the shape of private residences, clubs and residential flats. It is easy to see, therefore, that London, and indeed all our great towns, will be called upon to undergo reconstruction, and by that a field of activity will be opened out which will have an area that is calculated to take away the breath of the humdrum practitioners of this unreformed generation.

It is almost superfluous to say that in the reconstruction of cities full advantage is to be taken of the opportunity offered to rid them of their present objectionable features. Acres of inferior property will be swept away, and coming generations will know only by report of the degradation of our modern slums. Mr. HAYES suggests the formation of great squares, and as regards the Metropolis, pictures the East End converted into an immense park, treating us to a vision of a glorified London that should find a warm approval by those who sympathise with the object, though differing with the *modus operandi*, of the author. How the vision is to be easily and naturally realised the curious must learn if they are so disposed from the book itself. The style is perhaps more vigorous than graceful, a fault that will be overlooked by those who are eager for the dawn of better times; but, on the whole, it is a work that will be found strongly suggestive of thought even to the man who remains uncompromisingly antagonistic to the principles it

enunciates. By asking the reader to suppose that a revolution which goes beyond all its predecessors can be accomplished within a space of eleven years is to make too great a strain on all who have only experience to guide them. If Mr. HAYES had postponed the Phalanx reign for a century or two, his pages would appear less extravagant.

"IS GOTHIC ARCHITECTURE A FAILURE?"—III.

[BY A CORRESPONDENT.]

(Concluded.)

THE best mouldings of the Early English period are not only charming in their great variety, but possess vigour where it is wanted, while the delicate little fillet is carefully proportioned as to its width, and the deep hollows with their cavernous shadows cunningly set where they "tell." The Early French treatment with its square orders and bold round mouldings has certainly far less variety in contour, though it has the merit of much decision. But for true grace the English mode is unsurpassed, and has the advantage of complete freedom from Classic types. While it soon became original the inception was from its mother, whose guiding hand it acknowledged till, later on, free from leading-strings, it pursued a separate distinct path of its own, but ever remembering the maternal suggestions and early help to its youthful footsteps. But to quit metaphor, the use of the circular plan in the abacus and upper mouldings of the capitals gave a greater variety to the perspective than was the case with the square or partly octagonal abacus. The architect who remembers his first efforts to sketch such mouldings can readily call to mind the great difficulty he experienced in correctly putting upon drawing-paper what he could see plainly enough. The capital with straight lines in its upper members is certainly more easy to draw. There is indeed a peculiar charm in the plan of the former, which the writer believes to be traceable to the theory he has propounded. There may be an emphasis about the sharp angles of a square abacus, and about the comparatively severe moulded arches that is lost in the circular one with the softer outlines both in the capital and above it. But on the other hand, the English treatment is the more graceful of the two. It ought to be a subject of thankfulness that these beauties are found not only in our stately cathedrals, or great abbey and collegiate buildings, but exist in many a gem of village church with which these favoured islands are nearly everywhere studded.

In vain does one search among the architecture of the Renaissance for anything in the shape of window tracery beyond that which is to be found in some of the Venetian palaces—two semicircular arches under a larger enclosing one of the same form, all having the same springing line, the intermediate space being filled up by a circle. If the architect ventured further he would get landed into Gothic tracery, which would be considered out of place. In the very late Flamboyant work of France, and in the peculiar Churriguesque style of Spain, with Classic and Mediæval features singularly and ungracefully mixed up, such tracery in windows and other positions occur. But the effect is *bizarre*, and the ornamentation does not seem to fit in properly. The limitation to a semicircular or segmental arch struck from one centre therefore effectually puts a stop to any further launching out in that form of decorative work—tracery—which is one of the glories of Gothic architecture.

There is another feature allied to window-tracery, in which the Mediæval men showed how much variety could be attained. This is the wall arcade, notably in the Early English period, when there was plenty of thickness of wall at disposal. There are many instances of that pleasing treatment of an arcade in two quite distinct planes, the one behind the other, the shafts at the back centring with the apex of the arches to the foremost arcade, the latter being foiled and the former simply pointed. A good example of this is seen in the interior of Lincoln Cathedral. But there is not the slightest reason why arcades of this description should be confined to ecclesiastical work. At the present time great municipal and other buildings are constantly being erected, such as were not put up during the Middle Ages in this land, when small countries like Belgium had their numerous great *hôtels de ville*, whereas, beyond

Westminster Hall and a few other examples, Great Britain possessed few. Nor need we of the nineteenth century reproach our forefathers for this scarcity, as the need of such structures was not then felt, our mode of living and social habits being so different to those of continental nations. In Mediæval domestic buildings this country is, happily, richer than over the Channel, thanks to our insular position, for the Civil Wars did not have the result of causing such destruction as might have happened had England been overrun by foreign aggressors.

Parapets in the Gothic times of this country were either made straight or embattled on the top, and if it was desired to emphasise them at the angles of the building, a pier surmounted by a pinnacle was put. In Roman architecture the same idea would perhaps be carried out by a pier of slight projection, carrying sculpture or a vase. It has been left to the present generation of architects to copy a debased form and sometimes to ramp the parapet at the angles with unfortunate effect. The old paths are the best.

In miniature tabernacle-work and in delicately-treated oak fittings, such as screens, pulpits, rood-lofts, font-covers, bench-ends, &c., there can be no question whatever that Mediæval work, in the period of the early part of the fifteenth century, greatly excels. Renaissance does not lend itself so readily to such details, whilst pinnacles, crockets and finials, buttresses, cusplings and such like in Gothic work afford an unsurpassed wealth of variety in which the able architect can revel with pleasure. In order to make a fair comparison, a man cannot do better than examine such a feature, for example, as the oak reredos of a Wrenian church in the City, and then go and look at the splendid Mediæval stone altar-screens still happily remaining in England, with their exquisitely delicate and minute detail in such abundance. The writer is instancing ecclesiastical Gothic work, but the same argument would hold good in any somewhat similar decorative adjuncts in a secular or domestic building, for the principle is similar.

There is a popular idea that the Gothic style is not adapted to large secular buildings, because the requisite amount of dignity and stateliness cannot be obtained in it as can be in Classic work. But these qualities certainly exist in the Houses of Parliament and in the much older Westminster Hall, for instance. To take three well-known Renaissance examples, *i.e.* the United Service Institution (formerly the Chapel Royal), Whitehall; Somerset House, and Child's Bank, Fleet Street—all of different dates. These buildings display the desired qualities more than the New Law Courts. The reason for this is that there are certain recognised stock elements in a Renaissance design which can be applied with sure effect. This is not so easy in a structure reared on Gothic lines, and requires more study. The municipal buildings in Belgium show what splendid architectural results were attained in the Middle Ages, with abundance of dignity, too. The goddess of Gothic art may well exclaim, "Save me from my friends!" for they have inflicted injury on her by their injudicious treatment. In the extension of the Record Office, on the east side of Chancery Lane, there is the same stereotyped form of traceried window that exists in the older part of the building. This is out of date for general use in secular work at the present day, as has been pointed out in an earlier part of this article. Surely if the eminent architect of this pile were now alive he would scarcely have adopted such a treatment.

There is another absurdity perpetrated not long since by some eminent architects of Gothic training, an absurdity that has been often condemned, but it appears to have been only "scotched," not killed. It is that old gargoyle who persistently contrives to peer out in the heights above, where he is not the least wanted, either for symbolic reasons or for utility. The most modern example that the writer has noticed (particularly when he pays his premiums) is that to the Metropolitan Life Assurance Society, Moorgate Street, where the gargoyles are in the turret over the principal entrance. Of course they are "make-believes" here, as in another older building in the City not far off—MAPPIN & WEBB'S, at the corner of Queen Victoria Street and the Poultry. Another Life Assurance Society's house is a like offender in this respect, *i.e.* the Prudential, Holborn, where the gargoyle looks even more ridiculous, as there is a down-pipe just beneath it. No doubt there is a character and

piquancy in this picturesque projection at the angles which all architects like, particularly in towers. At the church of St. Augustine, Queen's Gate, there are useless gargoyles to the west bell-turret, close to the porches, with entrance archways having that aspect. But it is a reflection on the talent and inventiveness of present-day architects that they do not soar above such "shams." It is superfluous to add that if due search were to be made, numerous instances of like absurdities in the Neo-Renaissance work would be discovered. But they are not so patent as the one just mentioned, and are therefore more excusable.

There is one fine and important building, St. Paul's School, West Kensington, not long since erected, which is essentially Gothic in its style, and being situated in an open part of the suburbs is exceptionally fortunate in its favourable site, facing a great high road, with a good space in front of it and an unencumbered position towards the west and south, though it is not quite so open on the east side. The architectural treatment is mainly in the feeling of Early Perpendicular, as particularly evidenced by the fenestration; and it is unquestionably a very stately looking fabric, just such as a great public school ought to be. When the very ruddy hue of the terra-cotta and brickwork has toned down (which process seems a long time about), this structure will look even more dignified than it does now.

The City Guilds building in the Exhibition Road, South Kensington, another work by Mr. WATERHOUSE, is also stately, but is not Gothic. The designation would probably be Neo-Renaissance, and there is a good deal of Mediæval spirit about it, though it would be difficult to pick out an individual feature and call it of that style. As in this eminent architect's other excellent works, there is a certain stiffness. But Mr. WATERHOUSE is never vulgar in his treatment and does not overdo his ornamentation. He eschews meretricious decoration, so that there is always a suitable amount of repose in his designs. In the Natural History Museum he has given to London a very dignified and appropriate building for its purpose. Its columnar character gives much help in that respect, while the style is consistent throughout, based on a Romanesque *motif*, but handled throughout with some degree of originality. The least successful productions of Mr. WATERHOUSE are probably the collegiate additions at Oxford, but here he sins in good company. The writer has somewhat enlarged on this particular architect's manner, not with any object of making invidious comparisons, but because he considers one of the chief merits of this master is, that in whatever style he works he sticks to it, and thus avoids the semblance of a jumbled cluster of odd fragments put side by side, which is one of the banes of some of the fashionable architecture of the day. No doubt at times this restraint may involve a want of grace, which other less scrupulous practitioners contrive to infuse by means of bastard details, adroitly inserted where they "tell" best. In ancient Elizabethan and Jacobean work Italian architecture was converted into a distinctly native style, grafted on to the Mediæval, and thus appearing to grow naturally out of it. Whereas in the structures of the present day, little morsels of Renaissance are oftentimes capriciously tossed into a kind of Gothic pie, where they look out of place and as if they had dropped in there by accident. There is a beautiful building, recently erected in Piccadilly at the east side of Eagle Court, close to the Circus, which is essentially of the Italian Renaissance style, except in the elegant miniature columns employed instead of balusters, carrying the copings of the balconies, which are of Italian Gothic character. Yet this mixture does not impress the eye as being incongruous, for in the words of the refrain of a popular song that used to be greeted with great applause at the defunct Evans's, "It all depends upon the way in which it's done." In the case in point, to continue the metaphor, the mixture was evidently prepared by a skilful physician.

In concluding these remarks, which might of course have been pursued at much greater length, the writer has endeavoured in a measure to thus briefly indicate an answer to the question asked at the commencement of this article.

Mr. J. D. Webster, Sheffield, has been appointed to the vacant diocesan surveyorship for the diocese of York.

BRITISH SCHOOL AT ATHENS.

LAST week we briefly noticed that a meeting of the British School of Archæology had been held at 22 Albemarle Street. The chair was taken by Mr. Bryce, M.P., and there were present Lord Ribblesdale, Mr. and Mrs. Asquith, the Hon. Reginald Lister, Mr. F. Elliot, Professor Lewis Campbell, Professor Pelham, Rev. J. E. C. Welldon, the Provost of Oriel, Professor Butcher, Mr. Sidney Colvin, Mr. F. C. Penrose, Mr. and Mrs. Theodore Bent, Mr. Walter Leaf, Mr. Hamilton Lang, Admiral Sir Erasmus Ommanney, Dr. Sandys, Mrs. Ernest Gardner, Dr. Waldstein and others. Letters of regret had been received from Mr. John Morley, M.P., Mr. A. J. Balfour, M.P., Professor Jebb, M.P., the Head-masters of Eton and Winchester, the President of Magdalen and the Vice-Chancellor of the University of Cambridge.

The hon. secretary, Mr. George A. Macmillan, read the report of the managing committee for 1893-94, which stated that though the number of students was rather below the average, and the one piece of excavation undertaken (on the site of Abae) was hardly so fruitful as had been expected, the school had held its own, and had attracted more pecuniary support than in any recent session. After a short account of the work of Mr. A. G. Bather, Mr. E. F. Benson, Mr. J. L. Myres, Mr. V. W. Yorke, Mr. D. G. Hogarth, Mr. E. R. Bevan, Mr. Gilbert Davies and Mr. Arkwright, the report said that the site of Abae, in Phocis, was chosen for excavation after very careful consideration. It was famous for its oracle, and reference was made not only by Pausanias, but by Herodotus and Sophocles, to the oracle, the fortress, and the temple of Apollo. The indications on the spot seemed full of promise, but after some three weeks' work, carried on in very severe weather, the excavators succeeded only in laying bare the plan of the temenos, with a temple, a *ναῖσκος* and a stoa. The whole place must have been sacked, for of sculpture only a few late fragments were discovered, and a few inscriptions, mostly of Roman date. Some bronze bowls of early technique were the only artistic product of much importance. On the adjoining site of Hyampolis some inscriptions were found, but nothing else of consequence. Mr. Benson had made an encouraging report on the prospects of archæological discovery at Alexandria, but for this purpose there were not anything like adequate funds. There was, however, an active archæological society in Alexandria itself, which had already done no small amount of work with very limited funds. Arrangements had happily been made to prolong the services of the director, Mr. Gardner, whose college fellowship and Craven studentship had expired, and who would, in the absence of further aid, have been obliged to resign. But by the efforts of Mr. Egerton, the British Minister at Athens and others, the committee had been able to reappoint Mr. Gardner for one year only at a salary of 500*l*. A special fund was being privately raised to meet the additional expenditure, and most opportunely a grant of 200*l*. had been made to the school from the Royal Bounty fund. The relations of the school with the other foreign schools in Athens and with the Greek archæological authorities had, as usual, been most friendly. Every facility was given by M. Kavvadias and his colleagues for carrying on the work at Abae, and special mention was due to the courtesy of M. Homolle in allowing the director of the school to examine at leisure the remarkable discoveries made by the French school at Delphi. The director and students had also had the advantage of following in detail the excavations still being carried on with so much success by Dr. Dörpfeld on various sites in Athens. The list of donations to the school had been considerably above the average of former years. It appeared that the French school enjoyed an income of more than 3,000*l*., and the German school an income of 2,000*l*. Both these schools were endowed by their respective Governments, but even the American school, which was of much later foundation, and depended upon the voluntary contributions of various colleges, could command an income of about 1,400*l*. a year. These facts formed in themselves an irresistible argument for enlarging the precarious income of 450*l*. upon which the British school now depended. In the autumn of 1893 the Hellenic Society renewed their annual grant of 100*l*. for another period of three years. The report concluded with an earnest appeal for further funds to enable the school to carry on its work in a manner worthy of the name it bore.

Mr. Bryce in moving the adoption of the report expressed his pleasure that Alexandria had been chosen for excavation. Great results might be expected from well-directed efforts in that city. Alexandria was covered with immense heaps of rubbish, and under the earlier period of Mohammedan domination was practically reduced to a waste. It was satisfactory also to note that work had been carried on in Cyprus and Lysia, as well as at Athens. Besides the direct work of teaching, the school rendered great service to visitors to Athens who were interested in archæological work. It was not, however, satisfactory to find that the school laboured under such financial embarrassment, especially when one found that the French,

German and American schools were in the enjoyment of such comparatively ample resources. Three ways might be suggested of increasing the funds of the school. First, there were the universities and their colleges. But those institutions were suffering severely from the agricultural depression; and the colleges had in many cases had to forego a large part of their dividends, which amounted in some instances only to one-half or even one-third of what they were fifteen or twenty years ago. The common funds both of Oxford and Cambridge were also at a very low point. Still Oxford was giving 100*l*. a year, though Cambridge was unable to help. The question was whether much of the money now devoted to prize fellowships would not be better spent on this work. Each university might, for example, in turn appropriate the income of a fellowship and enable the school to bridge over its difficulties, for there was little doubt that it would ultimately establish itself on a firmer basis. A second source was private benefaction. This, however, was unfortunately not a favourable time to appeal to the great landowners, in whose bosoms fears were being excited from another quarter. But there were many in this country whose fortunes had not been affected by agricultural depression, and to them an appeal might be made to enable the school gradually to get into easier circumstances. Thirdly, there was the State. Unhappily there were so many who could put in good claims for public assistance that the Treasury had been obliged to act on the principle of refusing all impartially. The demands of Asia Minor, University colleges, University extension and other admirable objects were constantly pressing the Chancellor of the Exchequer. It was almost a pity that the old indirect forms of endowment were no longer possible. Appointments in the State and the Church were no longer bestowed as a reward for classical study. The Greek play bishop was a thing of the past. Our nobility, too, no longer travelled *en grand seigneur*, or brought home artistic treasures as they did one hundred years ago. At the same time, if a claim were fairly and squarely made in Parliament he did not think there would be any unwillingness to respond. There was still much to be done in continental Greece, and even sites less famous than Delphi or Olympia might disclose valuable treasures. The Mediaeval history of Greece raised a series of problems which archæology might do much to solve. The Byzantine churches might throw great light on the past. Then in the islands—as might be inferred from such a book as that of Mr. Tozer on the *Ægean*—the philologist might investigate the Greek dialects with the hope of fruitful results. There was work to be done in the search for manuscripts in Egypt and in the inquiry into Hellenic remains in that country. Greek manuscripts of great interest also might reward our labours and the sources of Greek achievement in art, science and politics might be more fully traced for the delight and instruction of mankind.

Mr. Welldon seconded the motion.

Mr. Asquith said that he had not come with any intention of making a speech, nor had he any qualification which could add weight to the authoritative appeals which they had just heard. When he was at school and the University the study of classical archæology was regarded, he would not say as an eccentricity, but as a luxury, which the student who wished to do well in the schools might forego. He was glad to think that was no longer the case, because nothing could introduce more vividness and vitality into classical study than this form of research, which enabled us in a way beyond the means of literature to reconstruct the forms of ancient society. This school was enabling us to recover and decipher some of the lost pages in human history. There was no object for which an appeal might more legitimately be made. It was with shame that he heard that we were doing so little in comparison with other countries.

TESSERÆ.

S. Francesco della Vigna, Venice.

THE plan of the church of San Francesco della Vigna was prepared by Sansovino. A representation of the façade is given on a medal struck in 1534, but the patriarch of Aquileia, at whose expense it was to be built, not thinking it sufficiently magnificent, employed Palladio in 1562 to make the design which was afterwards executed. It appears that Sansovino's plan already begun was in 1533 submitted to Francesco Georgi, a brother of the convent, who proposed to rectify the proportions according to what he called Platonic principles. "I would," said he, "that the width should be of nine paces, nine being the square of three, a prime and a divine number; and that it should have a triple proportion to the length which should be of twenty-seven paces, forming a diapason and a diapente;" and then he goes on to say that this relation and harmony was appointed by God himself, who thus fashioned the world and directed Moses to observe it in the tabernacle, which was to be made according to the model shown to him on the mountain; which model according to the

opinion of the wise was the world itself. The author proceeds through all the parts of the church in the same style. That men should have such dreams, that they should write them, may not be a wonder; but that they should think such dreaming to be reason, that they should publish them as such and that the world should ever have received them as such does seem to be a little marvellous. With all these harmonious proportions, however, or without them the inside is not beautiful; the outside does not at all correspond with it and nobody need doubt that the building was the work of two architects. Palladio's churches have all one general disposition in front, a pediment in the centre supported on half columns and a sloping roof on each side resting on a smaller order, whose horizontal cornice is continued more or less perfectly in the intervals between the larger columns. The effect is always in some degree as if a great pediment over the smaller order had been cut away for the purpose of introducing the larger, and on this account it would be better entirely to omit all trace of the smaller order in the intervals of the larger. However, though not absolutely perfect, these buildings are very graceful; and hitherto no better mode seems to have been adopted for accommodating Roman architecture to the usual disposition of a Christian church. In the present example, the lower cornice is only continued in two or three flat members in the intercolumns, and there is a small projection in the wings on which the cornice returns, so that these flat mouldings alone are interrupted by the columns. Both orders are on a high continued pedestal, which breaks round the principal columns and is cut through to admit the door. Over the door is a large semicircular window.

French and English Renaissance.

In comparing the French and English modern schools of architecture, Le Grand, in his "Essay," has very candidly admitted our superiority. "The English," he says, "adopted Palladio, whilst we have followed the orders of Vignola, but with this difference—they adopted the plans of Palladio entire, and accompanied by all their elegance and simplicity, whilst we have applied the orders of Vignola to the most complex shapes in our buildings, and which we have overloaded with whimsical ornaments of the very worst taste, and the result of a comparison between the ancient architecture and ours is that our own is complex whilst that of the ancients was simple; theirs exhibits grand ideas in the most trifling edifices, whilst ours, in the execution of the greatest objects, are but a collection of small parts, and those united with difficulty, which is mis-called ingenuity." The fact is the French were ambitious of forming a new school; they were to invent new orders which were to be exclusively French, and their buildings in the age of Louis XIV. exhibit examples in which all kinds of incongruous ornament are collected together without principle or meaning. To this succeeded what they conceived to be the pure Grecian taste, but as it was before the Grecian monuments had been studied or understood, this second manner was in truth very little more elegant or perfect than the former. They are scarcely ever successful in their attempts to adopt the styles of antiquity, although there is no nation so prone to affect a species of classical show, and none more ambitious of giving to the productions in art a classical air. This is observable particularly in their school of design and in their drama, and yet it is impossible to contend that they have been successful. The difference of taste and manner between the French and the English may, perhaps, be accounted for in some degree by their different modes of study. The French, both in their studies and in their pursuits, adopt more of the academic system than is followed in England; they work in bodies and under the direction of the Government, whilst our most laboured productions are the works of individuals, and consequently more likely to afford specimens of originality, if not of perfection. Without entirely denying the benefit of academies for the advancement of the arts, it is only from frequent experience of their failure through mismanagement that the argument arises against increasing their number or extending their influence.

Maltese Buildings.

Instead of stuccoing the walls the Maltese builders cover them with a whitewash as thick as paste, and lay this over the mouldings as well as on the plain surface—a plan destructive of all beauty of detail. The village churches in Malta are remarkably fine, and one in particular at Zeitun would merit minute examination. We see there, as in some places in Italy, a range of lofty open arches, rising above the external wall of the side aisles to screen the roof. The judgment is not altogether satisfied with this piece of magnificence, because the idea is excited that it is intended in some measure to conceal the construction, and it seems too much for such an object, yet the eye is pleased. There is also a great deal of architecture in the private houses in the villages. A decorated doorway with a window on each side and a bold projecting balcony over it is the usual disposition. Sometimes the house is continued above this, with a large arch opening on to the balcony; sometimes the higher

part of the edifice is set back and the balustrade of the balcony is continued in front of a terrace, and in either case the appearance is very handsome and the parts are never crowded together. The fault of these villages is that they have nothing rural about them. The houses are placed close together, or at least with few and small intervals, and one or two palm-trees, with a few carobs, figs or cactus peeping above the stone wall is all that can be seen of vegetation.

Materials and Architecture.

In the erection of the great abbeys and collegiate churches, where no expense was spared, the materials were frequently fetched from great distances. Thus the soft freestone of Caen in Normandy was used in the construction of many of the principal churches and conventual buildings of the south and east of England. But in building private houses the cost of carriage was too great to admit of the use of such distant materials. Hence stone houses are only or chiefly to be met with in those parts of the country which possess beds of workable stone; as, for instance, upon that generally broad band of oolitic freestone which, beginning in Dorsetshire, stretches in a north-east direction across Somerset, the north-west of Wilts, Gloucester, Oxford, Northampton, Lincoln and the northern extremity of Yorkshire. It is upon, or within a short distance of this tract, that we meet with nearly all the most noble and decorated specimens of early Domestic architecture, as well as a rich assemblage of churches—all highly ornamented, in consequence of the easy-working character of the freestone. It is, however, greatly to be regretted that in some parts of the range this stone is liable to weather, as it is called, or scale off; a circumstance from which the splendid buildings of Oxford, in particular, have suffered such cruel mutilation. Eastward of this line runs the range of chalk hills through the counties of Dorset, South Wilts, Hants, Berks, Bucks, Hertford and Cambridge, branching off likewise into Surrey and Kent. In these, flints and hard chalk are the ordinary building materials, very unfavourable to architectural purposes, and occasioning a paucity of handsome ancient residences throughout that district. In the exceptions which occur, as at Cambridge itself, the stone has been laboriously brought from the neighbouring oolite range. In the remaining eastern counties the soil chiefly consists of alluvial clays and gravel, and compelled the adoption of bricks as a substitute for stone in the construction of houses of every class, by which the prevailing character of their architecture was materially affected. In London, however, the buildings are said by Stow to have been chiefly of wood up to the time of James I., who, by divers proclamations, enforced the use of brick and stone, as well, it is said, for the sake of preventing the too rapid consumption of our native forests as for security against fire. In the western and many of the midland counties, Devon, Worcester, Shropshire, Cheshire, Stafford, Leicester, Warwick, Nottinghamshire, &c., where the deep marly soil which geologists call the new red prevails, and which were anciently covered with extensive oak forests, timber has been always the principal material employed in the construction of houses. It is in this district that we still see so many of those picturesque buildings in which the wooden framework, painted black, contrasts so strikingly with the intervals of white plaster. Where the hard beds of stone which are interstratified with the marl have been employed, as in so many of the churches of these counties, the destruction occasioned by its weathering has been usually greater, even than what we have remarked of the Oxford oolite. Lamentable indeed is the condition of many of their exteriors. Their sculptured ornaments of every kind, pinnacle and crocket, cusp and foliated capital, are all corroded into shapeless knobs while each separate stone of the angles or flat wall is worn down by repeated exfoliations of the edges to a round lumpish form. The natural dingy red colour of the stone, by itself unfavourable, completes the disfigurement of the building. The architect or antiquary may study with interest these faded beauties and glean some information even from their unsightly remains; but, as architectural objects, their power of exciting general admiration is gone for ever. The same remark is unfortunately applicable to many of the otherwise most beautiful buildings of Scotland, where this red sandstone is still in common use, and little attention paid to its want of durability, so lamentably attested.

The Cathedral of Pisa.

Internally the building forms on the ground-plan a Latin cross, with double aisles to the nave and square part of the choir, with sixty-eight columns supporting arches on the ground-floor and four piers supporting an elliptical dome. The lateral tribunes, however, do not open entirely into the nave, and consequently rather appear as two additional edifices than as forming what should properly be called a transept. Above the first order there are galleries, with a pier over each column below, and supporting an arch of the same extent, but divided into two smaller arches by the help of a little intermediate column

Above these arches is a high wall, in the upper part of which are small semicircular-headed windows. Milizia sneers at these insignificant openings; yet they shed a pleasant diffused light, without ever becoming in themselves important objects. The ceiling is flat, that of the side aisles alone is vaulted; thus you see the internal disposition is very much like that of some of the Roman basilicas. The galleries of the choir are rather higher than those of the nave, and the Pointed arch occurs at the extremity of the latter. The lower columns may be classed in two sizes, those which divide the side aisles being smaller than those of the nave, but each range has varieties. The larger are of granite; of the smaller, some are granite, some marble of various sorts, two or three are fluted, the rest are plain, and these smaller columns differ also in height, giving sufficient proof of their having been made up of the materials of more ancient buildings. Some, perhaps, were brought from the East, as the Pisans carried on at that epoch a very extensive commerce. Some of the capitals are Composite, but more are Corinthian, and these vary in diameter, height, character and proportion to the column. The apophysis is generally large, and the bases are of meagre and ill-understood Attic, but not all precisely alike or bearing the same proportion to the columns. One base only is of the form peculiar to the Corinthian order. Some of the granite appears to be that of Sardinia or of the Isle of Elba, and columns of this material could hardly have come from the Levant. We may observe also pavonazzo, cippolino and Egyptian granite. A large plinth at bottom and a sort of pedestal above the capital have enabled the architect to spring all his arches from the same height.

Physical and Moral Elements in Painting.

The brilliant antithesis ascribed to Simonides, that "painting is mute poesy, and poetry speaking painting," made no part of the technic systems of antiquity. For this we may depend on the general practice of its artists, and still more safely on the philosophic discrimination of Plutarch, who tells us that as poetry and painting resemble each other in their uniform address to the senses for the impression they mean to make on our fancy, and by that on our mind, so they differ as essentially in their materials and their modes of application, which are regulated by the diversity of the organs they address—ear and eye. Successive action communicated by sounds and time are the medium of poetry; form displayed in space and momentaneous energy are the element of painting. As, if these premises be true, the distinct representation of continued action is refused to an art which cannot express even in a series of subjects but by a supposed mental effort in the spectator's mind the regular succession of their moments, it becomes evident that, instead of attempting to impress us by the indiscriminate usurpation of a principle out of its reach, it ought chiefly to rely for its effect on its great characteristics, space and form, singly or in apposition. In forms alone the idea of existence can be rendered permanent. Sounds die, words perish or become obsolete and obscure, even colours fade—forms alone can neither be extinguished nor misconstrued; by application to their standard alone description becomes intelligible and distinct. Thus the effectual-idea of corporeal beauty can strictly exist only in the plastic arts; for as the notion of beauty arises from the pleasure we feel in the harmonious co-operation of the various parts of some favourite object to one end at once, it implies their immediate coexistence in the mass they compose, and therefore can be distinctly perceived and conveyed to the mind by the eye alone; hence the representation of form in figure is the physical element of the art. But as bodies exist in time as well as in space, as the pleasure arising from the mere symmetry of an object is as transient as it is immediate, as harmony of parts, if the body be the agent of an internal power, depends for its proof on their application, it follows that the exclusive exhibition of inert and unemployed form would be a mistake of the medium for the end, and that character or action is required to make it an interesting object of imitation. And this is the moral element of the art.

Absorptive Properties of Bricks.

It would appear reasonable to assume that in the general way of building near London the mean weight of water absorbed by the bricks will not be less than 10 oz. per brick, particularly when the bricks are made on the spot and at once put into the work without previous exposure to the air. Excepting indeed in the case of a few bricks of very superior description, or of stocks specially selected for their hardness and semi-vitrified appearance, the quantity of water absorbed by the ordinary building bricks experimented on is in few instances less than this. It is estimated that a rod of brickwork requires 4,300 stocks and 86 cubic feet of mortar, of which we may assume about 39 cubic feet to be of lime, if the lime be grey. The 4,300 bricks, if dry, will absorb 43,000 oz. of water, and the 86 cubic feet of mortar will, if made of average lime and of average consistency, require about 32,000 oz. of water in its preparation, of which 8,000 oz., or

thereabouts, will enter into chemical combination with the lime, and quite 2,000 oz. be lost by evaporation. Under such circumstances we have therefore some 22,000 oz. of water in the mortar joints free to pass off to the bricks, and these have a power of absorbing 43,000 oz. The conditions in brickwork are of course less favourable to absorption than when the bricks are actually immersed; but, on the other hand, evaporation from the brick will occasion some loss of moisture (and in thin walls such loss will be considerable), before the mortar can set. In an experiment tried at Chatham on single bricks placed one on the other, the joints being subjected to a pressure of 56 lbs. for two hours, and their mean absorption when immersed being 15.7 oz., the bricks drank in on an average 2.7 oz. each. Taking two-thirds of this to represent the degree to which the stock bricks of the absorptive power above assumed would have imbibed water, we have, without reckoning that of the smaller faces, 1.8 oz. as the weight of water which would be taken per brick in a 4½-inch partition in the same time if similarly weighted, or for the rod 7,700 oz., being in two hours more than one-third of the total amount of water which the joints contain. Such calculations are of course very rough approximations to the actual truth, but they are sufficient to show that under such circumstances the mortar in contact with the bricks cannot retain the moisture which is required for the induration of hydraulic limes, and indeed, although few English engineers or architects now think of specifying that the materials used with lime mortars shall be wetted, those who have paid attention to the subject have well known its necessity and clearly stated it. Partington, in his "Complete Builder's Guide," says that "few workmen are sufficiently aware of the advantage of wetting bricks before they are used, but experience has shown that works in which this practice has been attended to have been much stronger than others in which it has been omitted." Amongst the circumstances which contribute to the speedy ruin of modern buildings he places the use of mortar "with dry bricks, and not unfrequently with warm ones." Rondelet, in his "Treatise on the Art of Building," says "that, in order to make the mortar unite better with the stones, it would be of advantage that the workmen should have near them a great bucket or trough of water, in which they should soak the stones before laying them, and a basket with open wickerwork for the spalls, which should be soaked in the same manner before mixing them with mortar. This mode of proceeding, which I have seen practised in many parts of Italy, is excellent for works which are to contain water, &c." Vicat writes:—"The whole secret of good manipulation and right employ is condensed in the following precept: stiff mortar and materials soaked." Our bricklayers, on the contrary, seem to have taken for their motto, "Dry bricks and drowned mortar."

Strength of Fortifications.

It has been argued that it is of little use to strengthen revetment walls and the buildings in fortresses, because nothing in the shape of masonry can resist artillery; but there is abundant evidence to show that the amount of fire requisite to produce a breach, all other things but the masonry being equal, is very different. Sir John Jones asserts that the walls of the south of Spain required twice as much firing to destroy them as the brick revetments of the north of Europe, and he attributes the difference to the superiority of the Spanish mortar. At St. Sebastian the distance of the batteries from the wall breached was 620 yards, at Ciudad Rodrigo, 570 yards. The revetment at St. Sebastian required 5,000 shot to form a breach of 30 feet, at Ciudad Rodrigo only 2,080 for a breach of the same width, and it was noticed that the first was of good masonry, the second of bad. The tower at Bomarsund caused surprise by the facility with which its masonry was destroyed. The revetment at Antwerp caused the French thirty-four hours of firing to produce a breach, and we may assume the brickwork to have been of the ordinary description found in northern Europe; this period would have been doubled, according to Sir John Jones, if the revetment had had the resistance of the walls of the south of Spain.

The Palace of Versailles.

Never perhaps was so complete a failure as the mass of incongruities at Versailles, and never such a profuse squandering of treasure and even of life. Dulaure, in his "History of Paris," states the expenses (including the moving of hills and the various other projects) at the incredible sum of forty-eight millions sterling; from twenty-two to thirty-six thousand labourers were constantly employed on the works. A camp was formed for the workmen near the spot, the limits of which were strictly guarded; and it was criminal even to notice the vast waste of life in the soldiers employed, 10,000 of whom are said to have fallen victims to excess of fatigue, and to an epidemic disease caused by the exhalations from the swampy ground.

NOTES AND COMMENTS.

A LETTER from the Rev. G. C. BELL, formerly head-master of Christ's Hospital and a member of the present Council, mentions five causes to which the diminution of the annual income of Christ's Hospital may be ascribed. They are:—

1. The fall in rents of the agricultural estates of the hospital, which form a considerable fraction of its whole property.
2. The falling-off in the benefactions from donation governors, which is said to be due to the curtailment of their privileges by the provisions of the new scheme.
3. The falling-off in legacies from similar causes.
4. The policy pursued by the governing body before the new scheme became law in 1890. In face of the loss of revenue from the three preceding causes, the Governors continued to admit children in larger numbers than the annual income would support, selling stock to cover the deficit. The permanent loss of income due to this policy has been considerable.
5. The fact that over 112,000% of capital was exempted by Parliament from the operation of the scheme. Over this the old governing body have retained their control, which has recently been confirmed by a judgment in Court. On the other hand, Christ's Hospital still possesses a net income of 50,000% a year. As fees varying from 10% to 20% a year can be paid by two-thirds of the pupils in the new boarding schools, about 10,000% a year can be calculated on from that source. There will be also the interest on the money, probably half a million, that is to be derived from the sale of the site in Newgate Street. The Council have, however, a right to assume that so ancient and useful an institution will, at the present stage of its history, receive liberal support from the citizens of London. Experts have long since concluded that the centre of the City is no longer a proper place for a school from which day boys were excluded. At St. Paul's School a different rule was exercised, the boys had the advantage of change of air every day. Yet, for sanitary reasons, the school was removed to Hammersmith. It is hard to keep boys immured in the City for nine months, when they could receive even a better education in a more healthy place. It is too late now to rebel against the scheme for the removal, for all that could be said in opposition was expressed long ago. It is true the site selected is not approved by experts, and, we imagine, it is one of the causes of the present commotion. The Council would, therefore, do well to consider whether by abandoning it and selecting another less remote from the Metropolis, they would not change many of their opponents into supporters.

As the constitution of local boards varies from time to time, it is to be expected that their decisions cannot be marked by uniformity. The arrangement of building lines in consequence is sometimes rigidly kept to a normal line, while at other times deviations are tolerated. A case which Mr. Justice NORTH has heard denotes what inconvenience may arise from the absence of uniformity. The Sutton Local Board applied for an injunction to prevent a grocer from rebuilding his premises in the High Street because he had not respected a line of frontage which had been prescribed. The defendant had submitted plans for a new building on the same site as one which he had taken down. The Board declined to approve of them unless the frontage was set back 6 feet. During the time the Board were deliberating, the rebuilding was commenced, and proceedings were therefore taken to suspend the operations. The defendant relied on the want of uniformity which was seen in the dealings of the Board. The houses on each side of his site were erected without any departure from the old lines, and no general line had been fixed for the High Street. From the defendant's point of view the conduct of the Local Board was arbitrary, which is one of the worst qualities of any sort of government. The judge was, however, bound to assume that the Board was inspired with an intention to carry out loyally the provisions of the Public Health Act, and it must therefore be left to their discretion whether an improvement was to be carried out in its entirety at once or was to extend over several years. The injunction was granted.

THE "pari mutuel" system of betting has brought many Frenchmen to ruin. The levies on it which are imposed by the authorities as the price of connivance are, however,

useful aids towards the erection of buildings for benevolent purposes. Two projects have just received sanction from the Paris Municipal Council. A sanatorium for phthisical patients is to be erected at Angicourt, near Liancourt, at a cost of 800,000 francs, and the whole of the money is to be derived from the "pari mutuel." A building is also to be erected in connection with the great St. Louis Hospital in Paris for children suffering from skin diseases. It will cost 1,500,000 francs, and three-fourths of the sum will be provided from the same source.

THE panorama appears to have become indispensable in Paris. M. POILPOT has no sooner completed one large work of the class than he finds another is awaiting him. Formerly landscapes were supposed to be the special subjects of panoramas, which it may be mentioned were devised exactly a century ago by ROBERT BARKER; but in modern works figures have preference, and especially men engaged in battle. M. POILPOT's projected panorama, which is announced, will celebrate the three CARNOTS. It will comprise representations of the events in which LAZARE CARNOT, the "Organiser of Victory" in the first Republic, was a participant, and especially the battle of Wattignies, which was gained under his command. No less important in another sense were his works on the "Métaphysique du Calcul Infinitésimal" and the "Géométrie de Position," but they are not paintable subjects. His son, HIPPOLYTE CARNOT, was an actor in the revolution of 1848, which will give an opportunity for the introduction of at least one stirring scene. The Presidential career of the lamented SADI CARNOT will form a pictorial history of France during the past seven years. As M. POILPOT has been able to secure the co-operation of M. T. CHARTAN, there is no doubt the portraits will be of exceptional merit.

ALTHOUGH there has been an extraordinary delay in setting out the contents of the Antwerp Exhibition, a visitor will not suffer the disappointment that was inevitable a couple of weeks ago. As the representatives of the various sections who form the international jury in the sections of fine art have arrived, it is evident that order has commenced to reign in what was chaos. At the first meeting of the jurors it was unanimously decided to elect M. ALBRECHT DE VRIENDT, the director of the Antwerp Academy, as president, and he was entitled to the honour not only on account of his official position, but from his eminence as an artist. Reproductions of some of his historical paintings have already appeared in *The Architect*. M. BOUGUEREAU, the French painter and president of the Société des Artistes Français, was chosen as vice-president of the jury. M. EMMANUEL DE MEESTER was appointed secretary. M. RAVILIN is the president of the Architectural Section; M. EUGENE PELIN, the Austrian artist, is over the jurors of the section of painting in oils and water-colours; M. ETIENNE LEROUX holds the same office for sculpture, and M. LAMOTTE for engraving, &c.

THE Commissioners for the Exhibition of 1891 have made the following appointments to Science Research Scholarships for the year 1894, on the recommendation of the authorities of the respective universities and colleges. The scholarships are of the value of 150% a year, and are tenable for two years (subject to a satisfactory report at the end of the first year) in any university at home or abroad, or in some other institution approved of by the Commissioners. The scholars are to devote themselves exclusively to some study which is important to the industries of the country:—University of Edinburgh, JOHN CARRUTHERS BEATTIE, B.Sc.; University of Glasgow, JAMES ROBERT ERSKINE-MURRAY, B.Sc.; University of Aberdeen, WILLIAM BROWN DAVIDSON, M.A., B.Sc.; University College, Bristol, REGINALD CHARLES CLINKER; Yorkshire College, Leeds, FRANKLAND DENT, B.Sc.; University College, Liverpool, ALFRED JAMES EWART, B.Sc.; University College, London, DAVID KING MORRIS; Owens College, Manchester, JULIUS FRITH; Durham College of Science, Newcastle-on-Tyne, ROBERT BEATTIE, A.Sc.; University College, Nottingham, WILLIAM BECKIT BURNIE; Queen's College, Galway, JOHN ALEXANDER M'CLELLAND, M.A.; FRANK BOTELER KENRICK, B.Sc.; FREDERICK JAMES ALEXANDER M'KITTRICK, B.Sc.

Chie Architect, July 20th 1894.





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11 EAST HARDING STREET PETER JANE

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G. WASHINGTON BROWNE, Architect.



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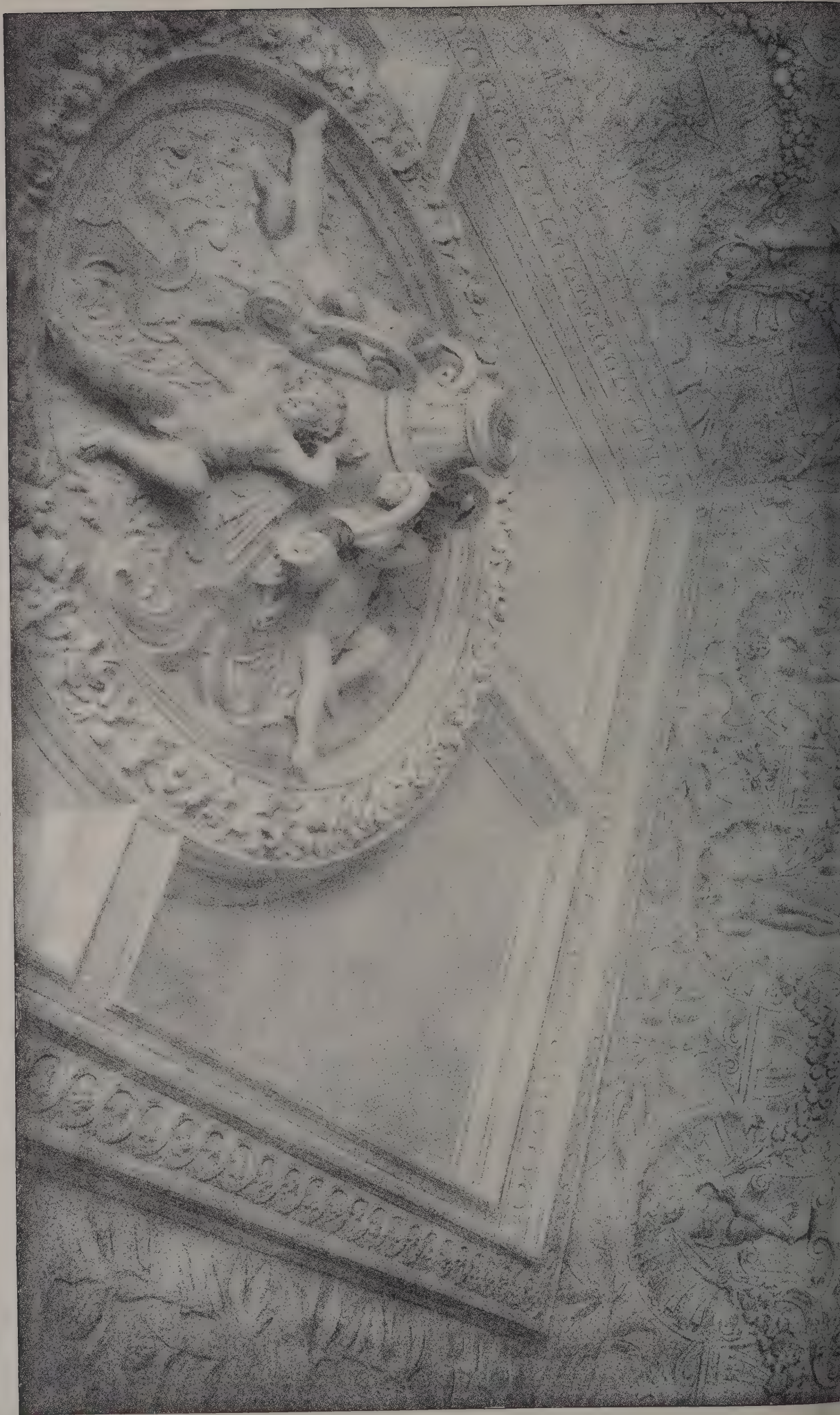
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The Architect, July 20th 1894.





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BATTERSEA POLYTECHNIC: UPPER HALL.
E. W. MOUNTFORD, Architect.

ILLUSTRATIONS.

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BATTERSEA POLYTECHNIC.—UPPER HALL.

THE CHIMNEYPiece.

By P. MORLEY HORDER.

THE interior decoration of our domestic buildings has always been more or less centralised by the fireplace, and it would be hard to think of a beautiful room robbed of this feature. Domestic buildings of all countries, whatever their climatic exigencies, have generally emphasised one portion of their living-rooms by such a feature, associated with the household Lares if not always with warmth and comfort. In England more than any other country the hearth has always been a gathering-place *par excellence*, a symbol in the mind's eye fraught with every domestic happiness. Here the master builder of old grew fanciful and exerted all his skill, here he consummated and drew together the various decorative lines of his room in almost wilful license of carving and quaint image. Modern ingenuity has relegated the log fire and open hearth into desuetude, although it is affected still by those anxious and able to have anything out of the ordinary. But the chimneypiece is still a feature in all rooms—in fact, machinery has given the smallest houses singular opportunities in this way, and the monumental proportions of many that are to be seen in quite small rooms would, in point of size and display, dwarf many an old one built for a lordly hall. The comparative study of an ancient and modern chimneypiece is fruitful of much reflection, and helps to a clearer definition of the principles that seem naturally to govern satisfactory wall-decoration. Turning over the pages of Nash's "Mansions of England," a thought suggests itself—What sort of a volume would a modern Nash produce if he attempted to illustrate the houses covering a period as long in modern times? Look for a moment at Nash's topographical sketches of interiors. Here are chimneypieces of the most elaborate and the simplest detail, but in every case the prevailing treatment of the room accords with this central feature, and where there is elaboration it is made legitimate by a proportionate redundancy of surrounding. A lofty and elaborate chimneypiece is balanced and made part of the wall by having its main lines carried round in panelling and enriched friezes. Then, too, look how the doors and windows are dignified and made architectural by perfectly-arranged and continuous lines of moulding. In short, the decoration is inevitably an outcome of the architecture, whose limitations are the best argument for the tendency of its lines.

The central truth of a study of these old examples is, then, that all good decoration is architectural—a beatification of the actual walls. Scattered up and down the land there are modern houses built by individuals fortunate enough to employ men who instinctively recognised such principles, and whose crowning pleasure in their work was reached when they were allowed to complete their architectural framework with a vesture of architectural decoration. A latter-day Nash might fill a volume with really beautiful examples of this century architecture in this way, but his record would be an exhibition not of national tendency but individual effort. Generally speaking, the ready-made chimneypiece is a symbol of no small significance; it is the sign-manual of the mere decorator—an individual whose knowledge is more of upholstery than architecture, whose existence is largely due to the mere professionalism of architects, more anxious for the accumulation of commission than the finished beauty of their buildings. Because small matters of internal finish ill repay the profession, rooms are generally left bare by the architect, to be decorated or furnished by another hand. The ready-made chimneypiece is inserted at the discretion of anyone, and will have no possible relation to the room. Erected over the fireplace opening, it will stand out in all its heavy grandeur of mahogany or oak-carved moulding as a piece of furniture rather than a decorative feature belonging to the wall. It is often bought obviously to match the furniture of the room, and the sensitive eye will appreciate no satisfying support to this aggressive feature, unless it be the heavy skirting at the base. Many an old room with a simple deal chimneypiece and a studied proportion of dado and architrave moulding has been infinitely better decorated than many modern rooms furnished in the most sumptuous style, but where there has been such complete failure to distinguish between decoration and furniture. All the most beautiful decorations one can recall leave a distinct impression, and in no way compete with the necessary furniture

of the room, but rather seem to emphasise it. Rob most modern rooms of their furniture and what have you left? Ready-made wall-decoration is, generally speaking, an anomaly, and the money spent on such isolated features would, as a rule, cover the expense of a simple treatment of all the wall space. If your rooms are small you are only further reducing their scale by putting up a large and complicated feature on one wall. The very finest effects, as well as the best setting for good pictures and furniture, neither of which can be seen to any advantage in irregular and aggressive surroundings, can always be obtained by simple moulded divisions and plain tints.

The worst offender against all such simple traditional ideas is the person who knows least about architecture—the lady-decorator so-called—the journalistic art-adviser who tells you where to get this or that piece of drapery, wall-paper or covering, with no knowledge of the relative surroundings or architectural features of the room in question. Art is suffering its last indignity from this person—greater even than at the hands of the periodical art faddist, for the advice of this apparently candid friend is calculated with due regard to the wares of enterprising art furnishers.

It is difficult to understand the helplessness of most people on the question of how to furnish their houses and their desire to study some book on the subject. The results of advice sought on the subject of the mere furnishings and trappings of a house must end in failure, or at least be the destruction of individual charm in one's own residence. The lady decorator will offer you the data and arrangement considered up to date, and sufficiently showy to please the majority. On the other hand, the properly designed house will suggest its own simple lines of decoration, and make all genuine useful furniture appropriate. The accessibility of beauty to the majority in these days makes the misuse of such opportunities the more deplorable. To clear the house of all the garbage of useless and ineffective furniture, pots, china, of everything that is confusing and has no inherent value of its own except its uselessness, would be the first step to be taken in most houses. Finally, to wage war against the all-pervading spirit, the chief results of which are symbolised by the showy mantelpiece, to make our rooms less assertive and more restful.

YORKSHIRE ARCHITECTURAL SOCIETY.

THE members of the Yorkshire Architectural Society made their annual excursion to several interesting places in the Kirbymoorside and Lastingham district. The party left York, and were conveyed by rail to Nawton Station, where carriages were in waiting to take them to the quaint old Saxon church at Kirkdale, the features of which were explained by Mr. Geo. Frank. The Kirkdale Cave, close by, was also visited, and afterwards a move was made for Welburn Hall, where Mr. Brierley, the architect for the restoration and rebuilding, acted as cicerone. He explained that the new wing practically occupied the site of an old timber-built manor-house which was left in the twelfth century to the monks of Rievaulx Abbey for the purpose of a retreat. At the dissolution the estate passed to Charles Savile, Duke of Buckingham, and eventually to Sir John Gibson, who built a new stone wing. When Miss Clarke, the present owner, bought the estate four years ago she found the timber-built portion of the house quite beyond restoration or repair, and so decided to rebuild it of stone. The work had been carried out in a most complete and beautiful way, the carved oak panelling of the rooms and galleries and the modelled plaster ceilings being quite unique. Subsequently the visitors drove to Lastingham, through Kirbymoorside and Appleton-le-Moors, and after viewing the Norman church, with its Saxon crypt, returned by way of Hutton-le-Hole, Douthwaite Dale, and Ravenswick. The party dined at the King's Head Hotel, Kirbymoorside. The Rev. W. Haworth, treasurer, presided, and gave a short account of the history and objects of the society, pointing out especially that its work was to assist the study of ecclesiastical architecture and to promote a keen interest in the ancient and historic buildings with which the county so plentifully abounded.

On the proposition of the hon. secretary (Mr. G. H. Fowler-Jones), the following new members were elected:—The Archbishop of York, the Revs. R. G. Fish, Castle Howard Rectory, H. E. Ketchley, Barton-le-street, G. H. Lightfoot, Pickering, and J. A. Salmon, Lastingham; and Messrs. H. Copperthwaite, E. R. Dodsworth, J. Nelson, H. V. Scott, and G. Teesdale, all of York. A vote of thanks was accorded to Miss Clarke for her kindness in permitting the party to visit the mansion at Welburn, on the motion of Mr. H. Copperthwaite, seconded by Mr. G. N. Fowler-Jones. The return journey was made *via* Pickering and Malton, and through the courtesy of the North-Eastern Railway, in allowing the visitors to travel by the express from Whitby, they were enabled to see the interesting frescoes in Pickering Church, which were described by the rector, the Rev. G. H. Lightfoot.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Continued from page 29.)

On Metal-work.

WE now come to the consideration of works in metal, and I shall be able to show that the same principles of suiting the design to the material and decorating construction were strictly adhered to by the artists of the Middle Ages in all their productions in metal, whether precious or common.

In the first place, hinges, locks, bolts, nails, &c., which are always concealed in modern designs, were rendered in Pointed

Hinges of this kind are not only beautiful in design, but they are practically good. We all know that on the principle of a lever a door may be easily torn off its modern hinges by a strain applied at its outward edge (fig. 2). This could not be the case with the ancient hinges, which extended the whole width of the door, and were bolted through in various places. In barn-doors and gates these hinges are still used, although devoid of any elegance of form; but they have been most

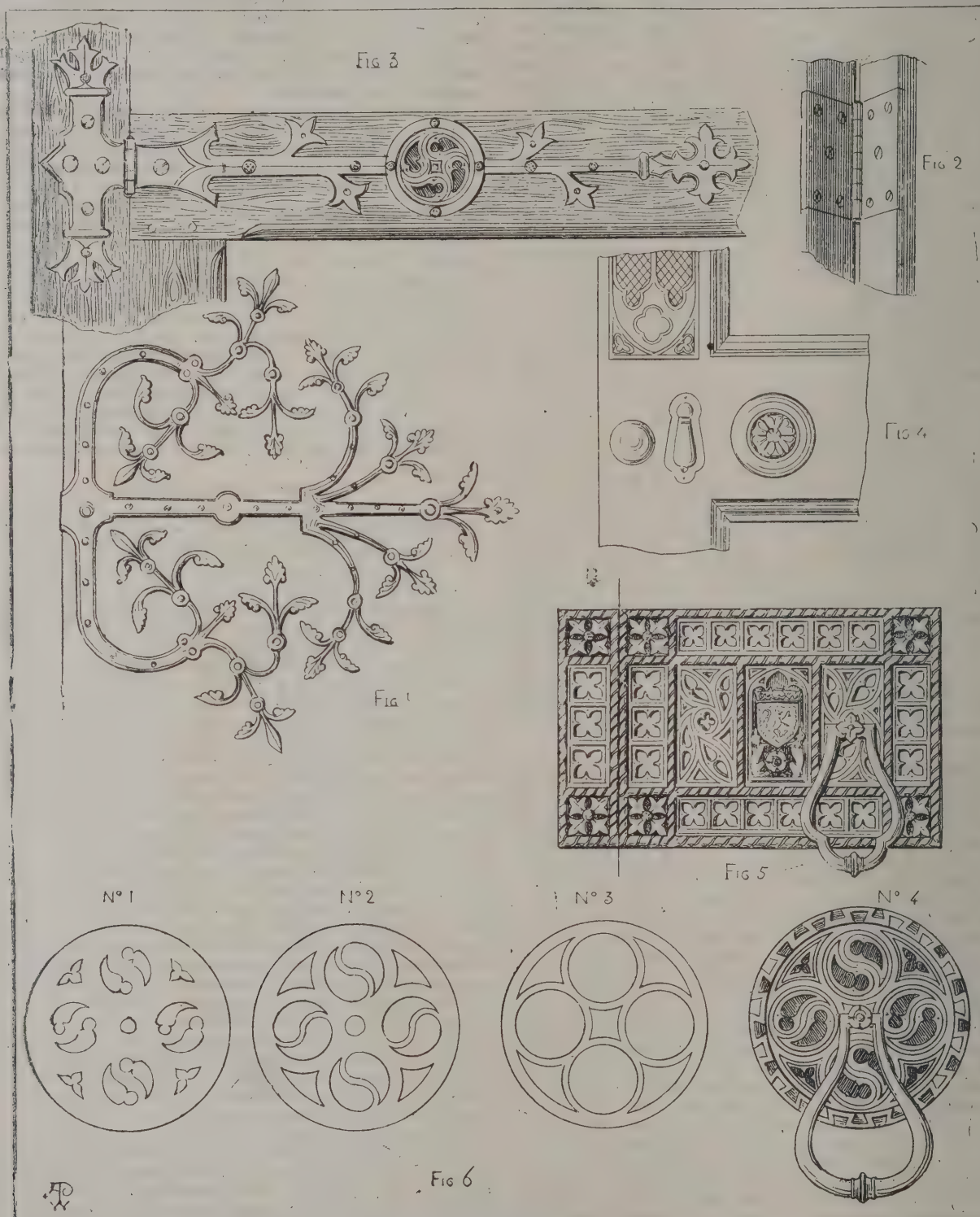


PLATE III.—Metal-work.

architecture rich and beautiful decorations; and this not only in the doors and fittings of buildings, but in cabinets and small articles of furniture.

The early hinges covered the whole face of the doors with varied and flowing scroll-work. Of this description are those of Notre Dame at Paris, St. Elizabeth's Church at Marburg, the western doors of Lichfield Cathedral, the chapter-house at York, and hundreds of other churches, both in England and on the Continent (plate III., figs. 1 and 3).

religiously banished from public edifices as unsightly, merely on account of our present race of artists not exercising the same ingenuity as those of ancient times in rendering the useful a vehicle for the beautiful; the same remarks will apply to locks that are now concealed and let into the styles of doors, which are often more than half cut away to receive them (plate III., fig. 4).

A lock was a subject on which the ancient smiths delighted to exercise the utmost resources of their art. The locks of

chests were generally of a most elaborate and beautiful description. A splendid example of an old lock still remains at Beddington Manor House, Surrey, and is engraved in my father's work of examples. In churches we not unfrequently find locks adorned with sacred subjects chased on them, with the most ingenious mechanical contrivances for concealing the key-hole. Keys were also highly ornamented with appropriate decorations, referring to the locks to which they belonged, and even the wards turned into beautiful devices and initial letters (plate III., fig. 5).

In all the ancient ornamental ironwork we may discern a peculiar manner of execution, admirably suited to the material,

Large tracery was either formed of round iron, like a stem twisted into intersections, or of flat iron bars of different thicknesses rivetted together, and the edges chamfered by filing.

Railings were not casts of meagre stone tracery (plate IV., fig. 4), but elegant combinations of metal bars, adjusted with due regard to strength and resistance (fig. 5).*

There are many fine specimens of this style of railing round tombs, and Westminster Abbey was rich in such examples, but they were actually pulled down and sold for old iron by the order of the then Dean, and even the exquisite scroll-work belonging to the tomb of Queen Eleanor, of which I have here given a specimen (fig. 6), was not respected. The iron screen

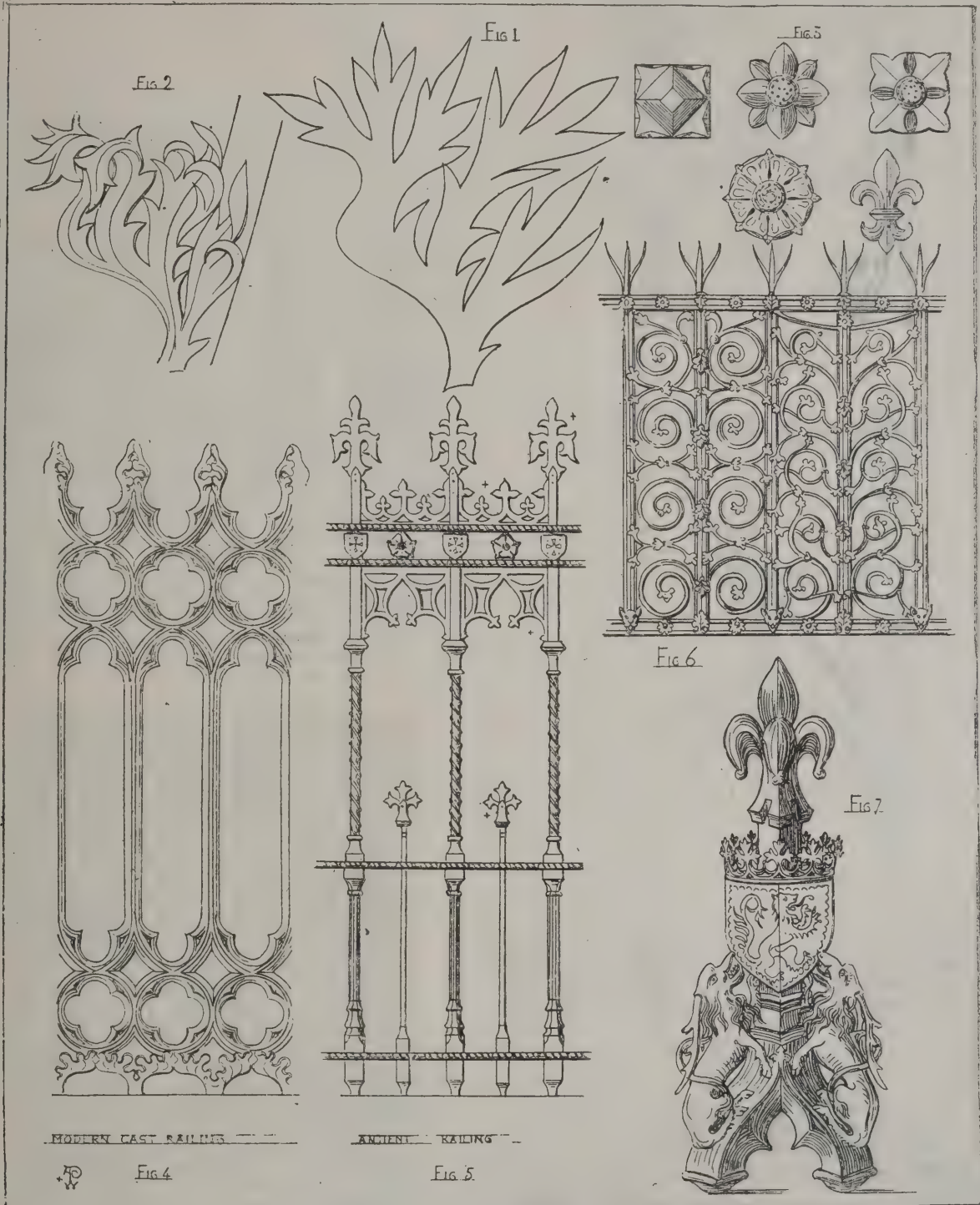


PLATE IV.—Metal-work.

and quite distinct from that of stone or wood. For instance, tracery was produced by different thicknesses of pierced plates laid over each other (plate III., fig. 6, Nos. 1 to 4).

Leaves and crockets were not carved or modelled and then cast, but cut out of thin metal plate, and twisted up with pliers (plate IV., figs 1, 2), and the lines of stems either engraved or soldered on. By these simple means all the lightness, ease and sharpness of real vegetation is produced at a much less cost than the heavy flat foliage usually cast and chased up. It is likewise to be remarked that the necessary fastenings for ironwork were always shown and ornamented. Bolts, nails and rivets, so far from being unsightly, are beautiful studs and busy enrichments if properly treated (fig 3).

of King Edward IV.'s tomb at St. George's Chapel, Windsor is a splendid example of ancient ironwork.

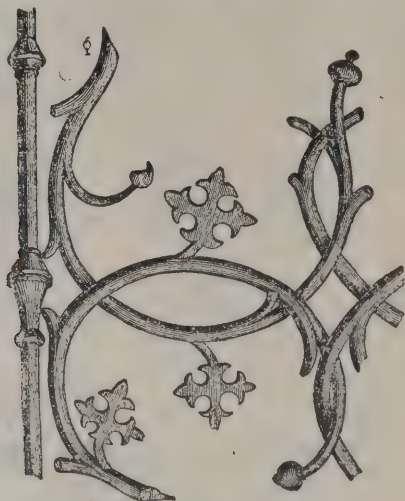
The fire-dogs, or andirons (fig. 7), as they were called, which supported either the fuel-logs where wood was burnt, or grates for coal, were frequently of splendid design. The ornaments were generally heraldic, and it was not unusual to work the finer parts in brass for relief of colour and richness of effect.

These form a striking contrast with the inconsistencies of modern grates, which are not unfrequently made to represent diminutive fronts of castellated or ecclesiastical buildings with

* The parts with a + in this figure are merely pierced out of thin plate, and rivetted to the bars.

turrets, loopholes, windows and doorways, all in a space of 40 inches (see figure below).

The fender is a sort of embattled parapet, with a lodge-gate at each end; the end of the poker is a sharp-pointed finial, and at the summit of the tongs is a saint. It is impossible to enumerate half the absurdities of modern metal-workers; but all these proceed from the false notion of disguising instead of

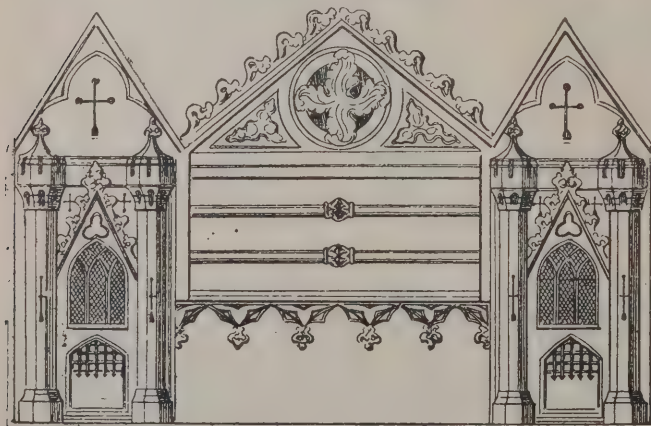


Well at Antwerp.



Iron Tracery.

beautifying articles of utility. How many objects of ordinary use are rendered monstrous and ridiculous simply because the artist, instead of seeking the most convenient form and then decorating it, has embodied some extravagance to conceal the



Pseudo-Gothic Grate.

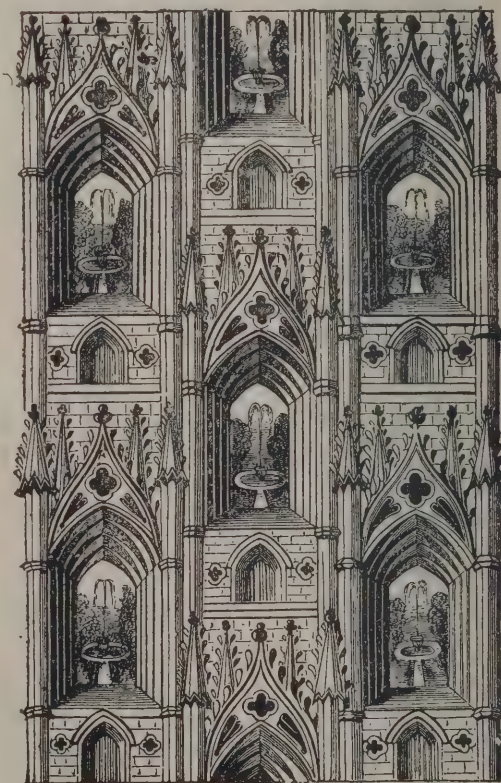
real purpose for which the article has been made. If a clock is required it is not unusual to cast a Roman warrior in a flying chariot, round one of the wheels of which, on close inspection, the hours may be described; or the whole front of a cathedral

church reduced to a few inches in height, with the clock-face occupying the position of a magnificent rose window. Surely the inventor of this patent clock-case could never have reflected that according to the scale on which the edifice was reduced his clock would be about 200 feet in circumference, and that such a monster of a dial would crush the proportions of almost any building that could be raised. But this is nothing when compared to what we see continually produced from those inexhaustible mines of bad taste, Birmingham and Sheffield; staircase turrets for inkstands, monumental crosses for light-shades, gable ends hung on handles for door porters, and four



Pseudo-Gothic Metal-work.

doorways and a cluster of pillars to support a French lamp; while a pair of pinnacles supporting an arch is called a Gothic-pattern scraper, and a wiry compound of quatrefoils and fan tracery an abbey garden-seat (see above). Neither relative scale, form, purpose nor unity of style is ever considered by those who design these abominations; if they only



Pattern of Modern Gothic Paper.

introduce a quatrefoil or an acute arch, be the outline and style of the article ever so modern and debased, it is at once denominated and sold as Gothic.

While I am on this topic it may not be amiss to mention some other absurdities which may not be out of place, although they do not belong to metal-work. I will commence with

what are termed Gothic-pattern papers, for hanging walls, where a wretched caricature of a Pointed building is repeated from the skirting to the cornice in glorious confusion—door over pinnacle and pinnacle over door. This is a great favourite with hotel and tavern-keepers. Again, those papers which are shaded are defective in principle; for, as a paper is hung round a room, the ornament must frequently be shadowed on the light side.

The variety of these miserable patterns is quite surprising, and as the expense of cutting a block for a bad figure is equal if not greater than for a good one, there is not the shadow of an excuse for their continual reproduction. A moment's reflection must show the extreme absurdity of repeating a perspective over a large surface with some hundred different points of sight; a panel or wall may be enriched and decorated



Ancient Pattern for a Flock Paper.

at pleasure, but it should always be treated in a consistent manner.

Flock papers are admirable substitutes for the ancient hangings, but then they must consist of a pattern without shadow, with the forms relieved by the introduction of harmonious colours. Illuminated manuscripts of the thirteenth, fourteenth and fifteenth centuries would furnish an immense number of exquisite designs for this purpose.

These observations will apply to modern carpets, the patterns of which are generally shaded. Nothing can be more ridiculous than an apparently reversed groining to walk upon, or highly relieved foliage and perforated tracery for the decoration of a floor.

(To be continued.)

OXFORD ARCHITECTURAL SOCIETY.

THE members of this Society have just paid a visit to Southampton and district. At Porchester, the vicar, Rev. J. Vaughan, met them at the castle and gave an account of the church, which is situated within the castle enclosure. In the year 1133 Henry I. founded a monastery for Augustine canons to pray for the souls of his father William and his brother Rufus. The main fabric of the present church was built at this date, but the more elaborate carving of the west front and the arch, formerly opening into an apsidal chapel on the east face of the north transept, were probably later, and belonged as was suggested by the Sagittarius on the west door to the reign of Stephen. The font with its intricate arcading and interlacing work was also of the same date. Mr. Vaughan pointed out the corbels of the cloister roof beneath the lofty windows on the south of the nave and the rough patching at the west end of the nave where the conventual buildings on the west of the cloisters had abutted on the nave. The cloister square had formerly reached southwards to the castle wall, which may have bounded its southern side. Within twenty years of the foundation the canons migrated to Southwick, about three miles off, beyond Portsdown, probably, as was suggested, owing to the turbulence inseparable from an important castle in Stephen's reign. After this date the church had little or no recorded history, but several points could be elucidated from the structure itself. Apparently in Elizabethan times, as was

shown by the debased Perpendicular windows, the south transept was pulled down, the arch into the tower blocked up and the chancel was much shortened and lowered in pitch. Sundry repairs were carried out by Queen Anne which were recorded on a board with the royal arms on the north side of the nave. During the great French war the prisoners were employed in painting the square pews a deep blue colour; these pews were swept away within the last few years.

Mr. J. Parker, president of the Society, said that he doubted whether the church was actually built as early as 1133. Money was usually allowed to accumulate for several years after the so-called foundation, in order to prepare for building operations. As regarding the charter of foundation, the original was not in existence, but was only to be found in an "inspeximus" of 1269. The king was not really the founder, but only gave leave to others to leave money for the purpose, for which permission he got a handsome payment. It was curious that in the charter there was no mention at all of the castle, a mention which would certainly have been expected in the case of a church within a castle enclosure. The cathedral at Old Sarum was an instance in point. The question then arose whether the castle enclosure was in existence in 1133, and the structural evidence of the castle wall only served to throw additional doubt on its existence. The migration of the canons to Southwick might be placed between 1149 and 1153, for in grants by Pope Eugenius, who ruled between those dates, the change could be noted. From the Taxatio Papæ Nicholai of 1291 it was certain that the church was then independent of any monastery. The inference was that it had become a parish church after the canons' departure. If so the lord of the castle would be its patron, and would naturally look after its structure. It was therefore possible that the west front and other elaborate work had been built or enriched, after the canons' migration, in the reign of Henry II.

A discussion then took place on several doubtful points; as to the meaning of the two blocked arches at the south-east angle of the nave, which are only visible from the inside, the general opinion seemed to be that one, at any rate, was an entrance into the church from the cloisters. The vertical grooves visible above the string-course on each side of the nave, between the first and second windows to the west, from the tower arch, received no explanation. Another point of interest was the small square-headed window at the north-east angle of the nave, and the marks of a lean-to roof on the outside wall over it. A porch to the door in the north transept, or an anchorite's cell in the angle between nave and transept, were suggested as possible explanations.

On the south side of the nave, at the west end, Mr. Parker pointed out the springing of a barrel vault, which had carried part of the conventual building on the west side of the cloister.

The Norman castle occupies the north-west angle of the square enclosure, whose supposed Roman origin has been the cause of so much dispute among antiquaries. The long flights of steps leading up to the keep were climbed, and Mr. Parker gave an account of the history on the roof of the keep. He said that there were three possible derivations for the name Portchester: 1, from the Latin *portus*, harbour, and hence the camp on the harbour; 2, from Anglo-Saxon port-town—hence the camp, the town; 3, in the Anglo-Saxon Chronicle several raids of the Saxons are recorded at the end of the fifth century. In 495 Cerdic and Cynrig landed at Cerdicsore (perhaps Charmouth); in 501 Port and his sons landed at Portsume, which is generally supposed to be Portsmouth; possibly, as the Chronicle hints, Port gave his name to the "chester" which he found standing, but more probably the legend was invented to account for the name. Nennius in the ninth century gives Caer Peris among the Romano-British cities, and this Henry of Huntingdon in the twelfth century identifies as Porchester. The name Port occurs in the Anglo-Saxon Chronicle, but may refer to Portland in some cases. The name Port-ceaster is found in the Winchester Chartulary under the year 904, in an exchange of land between Edward the Elder and the Bishop of Winchester. Here it is described as a "ville." In a confirmation of the above by Eadgar in 960 Port-ceaster is called an "oppidum." Possibly this change of description may mean that Edgar had fortified it among the other military works of his reign. The present keep seems to have been built in the latter half of the twelfth century, but no records can be found to fix the exact date. King John was here very often during his reign. Nothing, however, besides the keep remains of the early building contemporary with the keep, except possibly fragments in the foundations of some of the buildings round the inner courtyard. In 1220 payments were made for "strengthening the castle," but of this date no remains exist. In 1264, after the battle of Lewes, Simon de Montfort gave the castle into the hands of his son, Simon the Younger, to guard against an invasion projected by the queen of Henry III. In the year 1274 Edward I. issued a commission for examining the castle and the report was that it was old and ruinous. Evidently after this date the whole of the inner court was rebuilt as its style shows, along with the land port or western

gate. Subsequent changes, notably in the reigns of Richard II. and Elizabeth, have left the inner court in its present state. About the walls of the outer square enclosure much discussion took place, Mr. Vaughan pointing out that they resembled the walls of Silchester in which similar bonding-stones of green sand are used, and Mr. Parker commenting on the absence of many Roman features, such as the pounded brick in the mortar and the want of bonding courses of tiles regularly laid. In either case the evidence seemed inconclusive.

From Netley Station the party walked to the ruins, a distance of about three-quarters of a mile. The ruins consist of the conventual church, which has a choir with north and south aisles, transepts with eastern aisles (the north transept has entirely disappeared above the foundations), and a nave with north and south aisles; to the south of the nave is the cloister court, with ranges of buildings on its east, south, and part of its west side, and to the east of the cloister court is a garden or court with its small isolated building at its east end. Assembling in the choir, the members were met by Mr. Dale, of the Hants Field Club, who had kindly offered his services in conducting the party over the ruins. Before inspecting the buildings, Mr. Parker gave a short account of the history of Netley and its abbey. The first mention of Netley was to be found, like that of Portchester, in the Anglo-Saxon Chronicle. Soon after the Saxon raid at Portsmouth in 501, the Chronicle says that Cerdic and Cynrig landed and slew a British king called Natanleag, who gave his name to the place of his death. But the doubtful character of this derivation is intensified when we find that the name Netley does not occur in early documents. The ancient parish in which it was included was Hune, now Hound. The foundation charter of 1239 gives the name as Letteley. It seems likely, therefore, that the difficulty of pronouncing Letteley caused the gradual change of "l" to "n," and that the story of the Anglo-Saxon Chronicle was invented to account for the name. In the year 1239, as given in an "inspeximus" of 1252, Henry III. granted leave to the monks of St. Edwardstowe to found an abbey at Letteley. The explanation of this was given in the annals of Waverley Abbey, which was the earliest Cistercian house in Britain, and whose annals were therefore peculiarly valuable for the history of the Cistercian Order. It appeared that Peter des Roches, Bishop of Winchester, had intended to found two houses for Cistercian monks. His death in 1238 balked him of his wish, but he left certain sums of money to his executors for the purpose. The result was that a Cistercian abbey was founded at St. Edwardstowe and filled with monks from Beaulieu Abbey. The dedication of the new abbey to Edward the Confessor explained the name of Edwardstowe. Mr. Parker then turned to the architecture of the church and conventual buildings. The church was all, practically speaking, of one date and of one design. The choir and transepts were rather earlier than the rest of the building, and were evidently begun soon after the foundation in 1239. The windows of choir and transepts are plain double lancets under one arch, with no piercing in the head. The south aisle seems to have been built next in order, as the windows, which are triple lancets under one arch, have the centre arch foliated. The north aisle was the next in date, the triple lancet windows having developed into what is practically one three-light window with tracery. All through the nave, however, the mouldings and general disposition were the same. The west window was a few years later than the rest of the building, having had regular Geometrical tracery. There was some difference of opinion as to the east window of the choir, which is of four lights, with an eight-foiled circle in the head; it had probably, however, been left unfinished till after the choir and side-walls of the nave were completed, as its more ornate style indicated. The conventual buildings were next commented upon. The upper storeys being gone, there was considerable difficulty in assigning to each building its proper use. The slype, which usually interposed between the south side of the south transept and the chapter-house, was wanting in this case, and its place was taken by a narrow room which seemed from its piscina and aumbry to have been a sacristy. To the south of this was the chapter-house, with the usual arcade in its west front, opening on the cloister. South of the chapter-house was the slype leading from the cloister to the court or garden mentioned as lying east of the cloister. South of the slype was a long room—the last on the east side of the cloister—which had been the subject of much doubt. It had usually been called the refectory, and the two rooms running at right angles to its southern end, respectively the buttery and kitchen. The discovery in 1893 of the foundations of a long building running south at right angles from the south side of the cloister makes it probable that these foundations belong to the refectory, which would then occupy the same place as at Beaulieu, the mother abbey, and the so-called refectory must be the monks' day-room. Over the sacristy, chapter-house, slype and the long room just mentioned ran the dormitory, several of the cubicle windows, though blocked up, being visible in its west wall. From the north end of the dormitory a stair ran down into the south-west angle of

the south transept, where was once a newel-stair, whose bonding into the transept wall was still to be seen. Access from the dormitory to the choir was possible through the clerestory of the transept, and down a newel-stair at the south-west angle of the choir. The same means of communication between dormitory and church is also to be seen at Beaulieu Abbey. As to the so-called kitchen and buttery, to the south of the long room, authorities differ. Some, on the ground that the main drain runs right under them, and that the fireplace is not suited for the purposes of cooking, would call them the garderobe and calefactory. Others called the larger room the guest-house, and the smaller, a buttery adjoining a kitchen, which once existed between it and the foundations recently discovered. It has also been suggested that it is the abbot's lodging. In the south wall of the cloister are visible the remains of the lavatory, under a series of shallow blank arches. South of this wall is a range of post-reformation buildings, put up by the lay owners to whom the abbey was granted, under which range the foundations were discovered. At the south-west corner of the cloister is a building, most likely the guest-house. This had, in accordance with the strict rule of the Cistercians, to be in a position cut off from the other abbey buildings. This building had only one small door opening on the cloister.

Beyond the garden which lies east of the cloister is an isolated building which was almost certainly the infirmary, though some had called it the abbot's lodging. Its isolated position made it peculiarly suited for an infirmary.

NATIONAL TRUSTEESHIP OF HISTORIC PLACES.

ON Monday evening a meeting was held in the Rubens Room of Grosvenor House, with the view of establishing a National Trust for Places of Historic Interest or Natural Beauty. The chair was occupied by the Duke of Westminster, and there was a good attendance. Among the provisional council are Lord Rosebery, the Dukes of Devonshire and Westminster, the Marquesses of Dufferin and Ripon, Mr. Shaw Lefevre, M.P., Mr. Leonard Courtney, M.P., Professor Huxley, Sir Frederic Leighton, Sir George Reid, the Masters of Trinity and Balliol, the President of Magdalen College (Oxford), the Provost of Eton, Mr. Holman Hunt, Mr. G. F. Watts, Mr. Alfred Waterhouse and other Royal Academicians, Mr. Walter Besant, Mrs. Fawcett, Mrs. Humphry Ward, Miss Harriott Yorke and Miss Octavia Hill. Among those present were:—The Earl of Stamford, Sir Frederick Pollock, the Earl of Carlisle, Professor Max Müller, Sir Robert Hunter, Mr. E. J. Poynter, R.A., Mr. D'Arcy Collyer, Mr. Pembroke Stephens and others. Letters of apology for absence, expressing sympathy with the objects of the meeting, were read from the Earl of Rosebery, the Marquess of Ripon, the Earl of Winchelsea, the Provost of Eton, the Master of Balliol, the Master of the Temple, Lord Meath, Lord Thring, Sir A. Blanford, Mr. A. Waterhouse, Sir Frederic Leighton, Mr. J. Bryce, M.P., Professor Dowden, Mr. H. Acland, M.P., Mrs. Henry Fawcett, Colonel Scott-Moncrieff and Mrs. Humphry Ward. Mr. G. F. Watts, R.A., wrote:—"The objects of the National Trust Society I fully appreciate and hope to see carried out. The world is too much with us, we are too apt to see only what happens to be of material importance, not always so valuable as it seems to be. I think it cannot be doubted that providing for the needs, interests and pleasures of those who are coming after us we should exercise the minds not only of statesmen, but of every one who has the well-being of the nation at heart. The wisest laws and the firmest enforcement of them will be powerless to remove discontent or cope with the consequences of it. Trades unions must be supplemented, for they cannot be put down, by unions among the thoughtful to promote pleasure and contentment. To keep alive interest in the history of the country is not one of the least happy of the means to be employed. I should be glad to co-operate with the Society by hearty personal activity, but from the uncertainty of the state of my health and want of time I am unable to undertake any kind of work outside my studio."

The Rev. Canon Rawnsley said the object of the proposed Association was to promote the preservation of places which were of value to the nation, either from their natural beauty, from their historic associations, from the means of education or recreation which they afforded, or from any other cause. The owners of such spots would often be willing to secure them to the public use on certain conditions, if there existed some simple means of giving effect to their wishes. They were not, however, always ready to make such places over to a local authority, nor was such authority always in a position to accept and manage them, while there was no other body in existence which was capable of holding land for purposes of public enjoyment. The precise conditions of the trust would depend partly upon the wishes of the donor, and partly upon the

character of the property. In continental cities it was not uncommon to find the houses of celebrated persons open to view on payment of a small fee, e.g. Albert Dürer's house at Nuremberg. Again, there might be cases in which an owner of property, while not prepared to dedicate it to the public, or even to admit the public to its enjoyment, would be very willing to prevent its conversion into a building estate (such a case as that of Holland House would occur to Londoners), if he could establish in perpetuity a legal restraint upon its use, and thus give the public a modified interest in it. Such an arrangement might probably be made with the proposed Association, which, being a corporate body, might be made the depositary of reversionary interests and covenants, enforceable at any time for the purpose of keeping the land *in statu quo*, or, if necessary, special statutory power for such a purpose might be obtained, as in the case of prehistoric monuments. The Association aimed at nothing more than supplying means for giving effect to the wishes of landowners, though no doubt its very existence might act as an incentive to generosity. In the first instance it could hardly expect to be more than the recipient of gifts—a lady had already expressed her desire to make over to the Association a beautiful sea-cliff on the west coast of Wales. But if its objects and mode of action found favour with the public, it would probably in time accumulate funds through gift, bequest or otherwise, which would enable it to purchase places of special beauty or interest as opportunity served, and in other cases funds might be raised for particular purposes. It was notorious that during the last two years the top of Snowdon, the island in the middle of Grasmere Lake, and the Lodore Falls have come into the market. Had such a trust as that now proposed been in existence, each of these places might have been obtained for the nation. If such an Association as that projected should acquire considerable property, it might be desirable to give it the authority of a Royal Charter or special Act of Parliament. But, in the first instance, the Association would be incorporated under the Joint Stock Companies Acts, with the license of the Board of Trade to dispense with the use of the word "limited." It was an essential condition of this license that no profit be made by the members of the Association, and that the property of the Association, in the event of dissolution, be not realised for the benefit of the members, but made over to such other body with similar aims as the members might choose or a court of law might direct. These conditions were also essential, in a case like the present, to give the public confidence in the Association.

Several resolutions in support of the objects of the Association having been passed, the proceedings terminated.

THE BETTERMENT SCHEME.

THE select committee of the House of Lords appointed to consider and report whether, in the case of improvements sanctioned by Parliament and effected by the expenditure of public funds, persons, the value of whose property is clearly increased by an improvement, can be equitably required to contribute to the cost of the improvements, have made the following report:—

1. The committee have taken evidence from the promoters of several Bills which have contained provisions for imposing what has been called a betterment charge in respect of improvements effected by local authorities.

2. They have also had before them witnesses who have had experience of the actual working of betterment charges in various forms, and they have taken the evidence of other experienced witnesses and of gentlemen who have written upon the subject.

3. They have made known their willingness to hear any evidence that any municipal body or local authority might be disposed to lay before them. The committee, having fully considered the evidence taken before them, have come to the following conclusions, viz.:—

(1) The principle of betterment—in other words, the principle that persons whose property has clearly been increased in market value by an improvement effected by local authorities should specially contribute to the cost of the improvement—is not in itself unjust, and such persons can equitably be required to do so. But the effect of a public work in raising the value of neighbouring lands is shown by experience to be uncertain. Whether in any particular case it is possible for a valuer to pronounce that such an effect has been produced by the completion of any public work is a point upon which the evidence of eminent valuers differs greatly.

(2) The Standing Orders should be amended so that in any case where a private Bill renders any property liable to a special charge on the ground that its market value will be increased by the completion of a public work, the owners of such property, or of any interest therein, shall be entitled to notice before the introduction of the Bill, in like manner as if the property were to be compulsorily purchased.

(3) It should be provided in the Bill that, within some reasonable period after the completion of the work, the owner of the property intended to be charged should receive notice of the amount of the charge which the local authority proposes to make in respect of the alleged increase in the market value of the property due to the work in question. Inasmuch as the appropriateness of the period must, to some extent, depend upon the nature of the work and the condition of the neighbourhood, it would be difficult to fix any definite time applicable to all cases, but these considerations should be borne in mind by the committee to which the Bill is referred. The period should not be so short that the effect of the improvement could not be adequately tested, and it should not be so long as to make the property intended to be charged suffer in its market value by the suspension of the decision as to the charge.

(4) In default of acquiescence by the person on whom notice is served, the amount of the charge to be made should be decided by an arbitrator, unless the said person claims to go before a jury, and the decision should be taken with as little delay as possible.

(5) All the costs of such arbitration or inquiry before a jury should be borne by the local authority claiming to lay such charge, unless the arbitrator or jury shall find or award the same sum or a greater sum than that which the local authority sought to lay upon the property, in which case each party shall bear his own costs incident to the arbitration or inquiry, and the costs of the arbitrator or jury shall be borne by each of the parties in equal proportions; unless it should be otherwise ordered by the arbitrators, or in the case of a jury by the High Court upon the ground that the opposition to the proposed charge has been frivolous and vexatious.

(6) If the owner has property in the immediate neighbourhood which is found to be injured in its market value by the same work, the amount of the injury should be considered in determining the charge to be imposed upon him for improvements.

(7) If the owner is of opinion that the charge exceeds the enhancement of market value due to the public work, he should be entitled to claim that the local authority should purchase the property in question at the value which it bore, without regard to any improvement conferred or to be conferred upon it by such work, but under such circumstances a local authority purchasing a freehold or long leasehold should not be compellable to dispossess the occupying tenants, and should, if they prefer it, be empowered to purchase the reversion, subject to any intermediate interests.

(8) If any question should arise as to the incidence of the betterment charge between any of the persons entitled to different interests in the same property charged, the question should be determined by arbitration.

(9) Various witnesses have illustrated their opinions by reference to the Bills now before Parliament, but the committee (to which these Bills have not been referred) has formed no opinion on the merits of either of the Bills in question, but inasmuch as the provision as to notices in paragraph (2) is inapplicable to the Bills already introduced, the committee consider that it ought to suffice if the select committee to which the Bills in question are to be referred should be satisfied that adequate notice has been given to all persons who may be affected by the proposed process of charging.

(10) The committee have received evidence upon what has been called "recoupment;" that is to say, powers given to a municipal or other public body to take land beyond what is necessary for the actual execution of the work, so that some part at least of the improved value may be secured by the improving public body in ease of the burden upon the ratepayers. Some evidence was given by persons who had actual experience of the operation of such a system, the general effect of which was that it had not proved successful; but the committee are not satisfied that it has ever been tried under circumstances calculated to make it successful, inasmuch as no sufficient power has ever yet been given to local authorities to become possessed of the improved properties without buying out all the trade interests, a course which is inevitably attended with wasteful and extravagant expenditure.

PRESERVATION OF LANDSCAPES.

ON Friday last Mr. Alfred Waterhouse, R.A., presided at the second annual meeting of the National Society for Checking the Abuses of Public Advertising. Sir Frederic Leighton, who was unable to be present, wrote:—"I am glad of this opportunity of assuring you in writing of my entire sympathy with the spirit which animates your Society. No-body can resent more warmly than I do the vulgar bluntness of feeling which leads men to deface, or to lend themselves to the defacing of, the charms of rural scenery with staring advertisements. I include those who lend themselves to this barbarism; for the tradesman who pushes in this manner his

pill, his plaster, or his nostrum is not more blameworthy, but indeed less, than he who hires out his meadow or his coppice for such a purpose, and earns a pittance at the cost of so much offence. Never more than in our overridden days was the soothing, restful atmosphere that breathes from natural scenery precious, needed. Never less than now can we afford to see its sweet silences invaded by these blatant blemishes of the strife of competing druggists and manufacturers, which, when we leave our towns, we would fain for a while forget. You will render good service if you abate this evil custom even a little."

The Chairman urged that every effort must be made to increase the membership of the Society. He was convinced that they had only to make known their aims to obtain for them wide and general acceptance.

Mr. John Richmond, hon. sec., read the annual report, which stated that one class of disfigurement which the Society desired to abate had in reality increased. Nevertheless, the Council believed that progress of a substantial kind had been made towards the ultimate accomplishment of the desired reform. Their efforts had at least made the regulation of spectacular advertising a public question. Two years ago it appeared to many the wildest of dreams to suppose that any serious hearing could be secured for a protest on the subject. They claimed already to have made it one of the recognised problems of the day. The question had been raised in a practical shape in many public bodies; the correspondence in many country newspapers proved that local opinion was not only roused, but was active, while they had obtained from a very large number of the most influential journals positive assurances of sympathy and support. They did not, of course, take any credit for the welcome and most valuable declaration made by Lord Rosebery at the Academy banquet regarding the growing danger to English landscape, but it was hardly presumptuous to believe that the Prime Minister would not have made a public profession of his faith and his fears if they had not done something to prepare the atmosphere for the discussion of the topic as one of grave urgency. They had made the defence of scenery, the protection of the rural picturesque, and respect for the proprieties of the eye in towns distinctly a public question.

Mr. Wyndham, M.P., moved the adoption of the report.

Mr. Fawcett seconded the motion, remarking that unless a check were put upon the growing evil, they might expect to see a sky-sign on Skiddaw and advertisements of pills on the dome of St. Paul's.

On the motion of Mr. E. Wilson, the thanks of the meeting were tendered the Earl of Rosebery for his having drawn public attention to the growing evil of advertising disfigurement, and to members of Parliament, municipal and county councils and the press, for the support given the principles of the Society.

SHEFFIELD TOWN HALL.

ON Monday, by invitation of Mr. E. W. Mountford, president of the Architectural Association, the members of the Sheffield Society of Architects and Surveyors met to be shown over the building. The plans and details were thoroughly explained as well as the materials and the manner of using them, and the descriptions were listened to with great attention and interest. There was a large number of visitors, who were divided into parties and conducted over the building respectively by Mr. Mountford, the architect; Mr. Scales, the clerk of works; and Mr. Robson, the contractor's manager. Many questions were asked and freely answered, and the various arrangements and details of the building were highly commended. A sample of one of the inside doors which had been set up in oak attracted considerable attention, and the hope was expressed on all hands that the City Council would adopt it and the other items suggested for the permanent improvement of this building, which should be a credit to the city. It would be a source of regret afterwards to find that for the sake of false economy this fine building had been spoilt for a comparatively insignificant saving. Mr. C. J. Innocent, hon. secretary, proposed that the thanks of the members present be tendered to Mr. Mountford and his staff for the kind and free manner in which the building and plans had been opened for the inspection of the members. The motion was seconded by Mr. Joseph Smith, a member of the council of the Society, who said he had been most interested in the building, and that he very sincerely hoped our city fathers would in their wisdom decide to adopt these few "extras," which for their effect in the building would be worth all they might cost. The vote was carried with acclamation; and Mr. Mountford, in responding, said it had been a very pleasant occasion to him. With respect to the items which he had suggested for the internal finishing of the building, it had been stated as a reason for not adopting them that to do so would be unfair to the other architects who competed, but he had heard to-day, from Mr. Gibbs and others, that such was not the view of the architects of Sheffield, and

indeed he would have been the last man to have proposed anything that would be unfair to the other competitors. He was glad to have heard the expressions of satisfaction with his work, and he could, at any rate, say of the building that it was thoroughly British, from the steel of the joists to the marble decoration of the walls. When the building was further advanced he would be pleased to invite the Society again to look over it, and place himself at their service.

Operations are now proceeding rapidly. The Surrey and Norfolk Street portions are nearly complete, so far as the outer work is concerned, very satisfactory progress is being made with the council-chamber section, and the erection of the front in Pinstone Street, where nothing has been done for a considerable time, is to be at once resumed. The contractor has now about two hundred men engaged, and of these about eighty are masons. The work has been retarded in consequence of the scarcity of masons. At no time have the services of a sufficient number been obtainable, but the contractor now hopes that the Surrey Street part of the building will be finished by the end of the year. Everything inside is, of course, in a rough state at the present time, but the opportunity of seeing the work as far as it has gone was gladly seized by many members of the Society.

GENERAL.

The Late Sir Henry Layard, it is stated, has bequeathed to the National Gallery a selection of the most valuable of his pictures, the gift to take effect on the death of his wife.

Excavations are being made in the precincts of Peterborough Cathedral, by permission of the dean and chapter, with a view to tracing any existing remains of the original Saxon monastery which stood on the site of the present cathedral. A portion of the old Saxon church was discovered under the pavement of the south transept during the restoration of the centre tower of the cathedral.

Mr. A. Smith-Woodward, of the British Museum, has been elected president of the Malton Naturalists' Society, in succession to Professor Miall, of the Yorkshire College. An excursion to Rosedale is being organised for August 8.

Mr. Mellor, formerly assistant surveyor, has been appointed borough surveyor and engineer for Tunbridge Wells, in succession to the late Mr. Brenthnall.

The Additions to York Cottage, Sandringham, which Colonel Edis is carrying out, are almost complete. They comprise several bedrooms and nurseries.

M. Jules Saintin, the French portraitist and painter of *genre* subjects, has died in Paris in his sixty-fourth year.

The Burgomaster of Haarlem has become president of the committee that has undertaken the erection of a memorial of Frank Hals, the painter, who, although a native of Malines, lived in Haarlem during many years, and died there in 1666.

M. Antonin Proust, who was the French Minister of Fine Arts a few years ago, has become the critic for music on the *Matin*.

The Manchester Field Naturalists lately made an excursion to Hathersage, where the vicar, Rev. C. Cutler, conducted the party through the church (which is a good example of the Late Decorated period), possessing several altar-tombs and monumental brasses of local celebrities, including one of Robert Eyre, who fought at Agincourt; in the churchyard is the reputed grave of Little John, Robin Hood's henchman. The vicar also pointed out the remains of an ancient earthwork known as Camp Green, close to the church, and which is of Danish or British construction.

The Summer Exhibition of pictures just opened at the York Corporation Art Gallery, with the works in the permanent collections, comprises upwards of 1,000 modern paintings, drawings in water-colours, black and white and paintings on china.

The Hope Trustees, having considered the report of Mr. Ewan Christian, the assessing architect, on the competitive plans for the Thomas Hope Hospital, to be erected at Langholm, have selected the design sent in by Mr. Woodd, New Bond Street, London. They have also resolved to proceed at once with building the hospital. The competing architects included gentlemen belonging to Edinburgh, Glasgow, London and Carlisle.

The Handsworth School Board have agreed to purchase a site in the Birchfield Road for the purpose of erecting new schools at a cost of 1,800*l.*, also to invite certain architects to send in competitive plans.

The "Nottingham Guardian" says the Corporation of Nottingham, through their castle museum committee, have authorised the art director, Mr. G. Harry Wallis, to form an exhibition of the works of Cornish painters in the autumn.

The Architect.

THE WEEK.

LITIGATION is expensive, but everyone who has a professional interest in the valuation of buildings will be anxious to have the decision of one of the higher Courts on a case which has arisen in Liverpool. The Grand Theatre has been used for the past year as a warehouse. In such a case is the former or the present use to determine the valuation? The Corporation insist on rates which are assessed on the supposition that the building was and can still be used as a theatre. According to the Act of 1864 rates are to be based on "the rent at which the hereditament might reasonably be expected to let from year to year," which is almost identical with the language of 6 & 7 Will. IV. c. 96. The Metropolitan Valuation Act of 1869 defines value as "the annual rent which a tenant might reasonably be expected, taking one year with another, to pay for an hereditament." Now it is not likely that a theatre would be used as a warehouse unless it was considered that such a use was preferable to leaving the building idle. The magistrates, who have twice heard the case, considered that the building should be accepted as a warehouse and rated accordingly, but the Corporation maintain it is a theatre, and accordingly have resolved to carry the case to other courts.

THE Congress of the British Institute of Public Health was opened on Wednesday evening by a conversazione at King's College. The proceedings in the Section of Engineering and Building Construction, of which Professor BANISTER FLETCHER is president, began on Thursday, and will be continued to-day and on Monday next. The subjects for discussion are the following:—"Sanitation of Flats," "A System of Softening Public Water Supplies," "Electric Lighting as a Health Agent," "The Destruction of Town Refuse," "Sewage Effluents," "Artisans' Dwellings," "The Planning of Fever Hospitals," "The Architectural Features of Elementary Schools from a Public Health Point of View," "The Eastwood and Greasley (Nottingham) Drainage Works," "A London Architect's Troubles with the Local Sanitary Authorities," "Electric Light, Power and Heating." There will be a small exhibition of plans of hospitals and asylums, and drawings illustrating schemes of sanitation which have recently been carried out.

THE select committee to whom the London Streets and Buildings Bill was referred have agreed to the following report:—1. That a report from the Home Office had been considered by the committee, and that they had adopted such of the recommendations therein contained as appeared applicable to the case as submitted to them. 2. That there are no other circumstances of which, in the opinion of the committee, it is desirable that the House should be informed. 3. That they had examined the allegations contained in the preamble of the Bill, and found the same, as amended, to be true, and had gone through the Bill and made amendments thereunto. The committee also state that they had made further amendments thereto, and had agreed to the following report:—"That a report from the Home Office on the Bill dated April 27, 1894, together with a supplemental report, dated June 13, 1894, were laid before the committee. As regards the clauses referred to in these reports: clauses 139 and 164 were withdrawn by the promoters; clauses 136, 150, 179 and 180 were, in various ways, amended and modified. As regards clause 144: after considering the existing enactments, which will be consolidated or re-enacted under the Bill, the committee were of opinion that this clause might be allowed. That there are no other circumstances of which, in the opinion of the committee, it is desirable that the House should be informed.

THE late EDMOND JEAN BAPTISTE GUILLAUME, who died in Paris on Friday last in his sixty-eighth year, was a type of the highest class among the French official architects. He was born in Valenciennes in 1826, and his townsmen sent him to Paris in his nineteenth year to study architec-

ture in the Ecole des Beaux-Arts. M. GUILLAUME'S success was not immediate. He did not win the Prix de Rome until 1856, when the subject was "An Embassy in Constantinople." After study in Rome he was sent to measure buildings in Asia Minor, and his labours were invaluable in suggesting some of the influences to which the Romans submitted themselves when designing temples. On his return to France he obtained a second-class medal in 1863 for his drawings of the Temple of AUGUSTUS or LUNUS at Ancyra, the sacred city. An opportunity to gain experience in works was given to him by his appointment as an inspector of buildings at the Palais de Justice. M. GUILLAUME gained his first commission in 1864, for he designed the pedestal of the large memorial of the defence of Paris which is seen in the Place Clichy. Afterwards his design was accepted for a palais de justice and hôtel de ville in Cambrai. In 1867 he was appointed first inspector of the palaces at St. Cloud and Malmaison. His name was inscribed on the roll of the Legion of Honour, but he never reached a high grade. Afterwards the care of the palaces of Versailles, the Louvre and the Tuileries was confided to him, and it was his melancholy duty to demolish the walls of the last which had survived the Commune. At the Louvre M. GUILLAUME rendered a valuable service by his exploration of the subterranean part belonging to the early palace. Since 1884 he was professor of the theory of architecture in the Ecole des Beaux-Arts. M. GUILLAUME was a scholarly architect, and many strangers as well as his countrymen must regret his loss, for he was always ready to help students who were studying the buildings entrusted to his charge.

AMONG the resolutions proposed at the meeting of the Church Sanitary Association at Grosvenor House on Thursday were the following:—It is desirable to approach the archbishops and bishops with a view to gaining their co-operation with the Society in its efforts to make known and enforce the hygienic necessity of personal cleanliness, fresh air, pure water, unadulterated food and wholesome dwellings by means of sermons, addresses, popular lectures and sanitary aid committees in the rural deaneries and parishes. It is desirable that the clergy and church-workers in every parish constitute themselves active officers of this Society to teach the laws of health, to promote the circulation of the publications of the National Health Association, the Ladies' Sanitary Association and kindred institutions, and to co-operate with the local medical officer of health, the local sanitary board and similar authorities. The Association was established two years ago and has already rendered service to sanitation.

THE proposal of Lord WEMYSS that the arch on the southern side of St. Paul's, opposite one occupied by the Wellington Monument, should be balanced by the introduction of a similar monument deserves some consideration. NELSON deserves to have as fine a memorial as could be created, and it would be an advantage if an effort were made to surpass STEVENS'S great work by another in honour of the great sailor. It must also be said that in Italian work symmetry is indispensable. A correspondent of the *Times*, in writing on the subject, says:—"We have no warrant for the supposition that, on condition of monumental erections in the building, Sir CHRISTOPHER imagined that they would be, or ought to be, designed in pairs like the paddle-boxes of a steamer. Sir CHRISTOPHER probably noted, and as probably favoured, as artists mostly do, the unbalanced effect of monuments in other cathedrals—say those, for instance, of CROUCHBACK and AYMER DE VALANCE at Westminster, and WILLIAM OF WYKEHAM at Winchester, and well knew that ultimately St. Paul's, as a matter of course, would be subject to like monumental effects. Under Lord WEMYSS'S dictum our cathedral choirs would all be furnished with not one, but two episcopal thrones, for the sake of 'balance.'" The correspondent, it will be observed, bases his argument on Gothic examples, but he forgets that one of the great differences between the Gothic and Classic, or Italian, is that the former may have one-sided effects which are not tolerated in the latter. The bishop's throne is really a case against him, for in the early basilican churches it was placed in the centre.

MR. RUSKIN'S "VERONA," ETC.*

IN the absence of a new and continuous work by Mr. RUSKIN, there cannot be a better substitute than a reprint of compositions by him which hitherto were known only to a few readers. The contents of the volume we have now to introduce are in that position. They consist of three lectures composed in 1870, and two of the chapters which were to have formed part of the series on Church history known as "Our Fathers have told Us." The lecture on "Verona and its Rivers" was delivered at the Royal Institution. "The Story of Arachne" was related before the students of the Woolwich School of Science and Art. The "Tortoise of Ægina" was intended to form the concluding lecture of a course on Greek sculpture, as illustrated by coins. The chapters on "Candida Casa," that is, the White House (Whithorn or Whitherne Abbey on the Solway), and "The Mending the Sieve" (an incident in the life of St. BENEDICT) relate to the history of monasticism, and the latter, it may be mentioned, was used for a reading at the London Institution in 1882. To the majority of readers of English books the whole work will be as novel as it is important.

Mr. RUSKIN's books become interesting not only on account of the knowledge so laboriously acquired, which he imparts in the pages, but also from the perfection with which they express his moods from time to time. He has no fear about being charged with inconsistency, and his frank admissions of changes of opinion must win the sympathies of the majority of his readers, for, if they are thoughtful, they also have had experience of mental transformations. In the pages before us there is much which is evidence of the conviction that a belief in one's own infallibility is not becoming in any man, and it is safe to be in dread of what is called "the boundless possibility of self-deception." Mr. RUSKIN, when writing the chapters, was we presume more subdued than formerly, and his own disappointments made him full of pity for things which at one time would have excited scorn and indignation. He no longer appears desirous to convert or destroy the world with the lightning of Jove himself. In 1870 he bore more resemblance to one of the old missionary monks of whom he wrote, who were happy when they saw slight signs of amelioration in return for all their labours. Some years earlier Mr. RUSKIN was in despair because packets of TURNER'S sketches were preserved in the basement of the National Gallery instead of being displayed in a palace. But a longer experience of the world appears to have convinced him that it is a theatre wherein more woful pageants are, and were always, presented, than were possible in Trafalgar Square. "There are no tragedies," he says in his first lecture, "like the tragedies of Verona under the Gothic and Lombard kings," but in his pages there are at least glimpses of many that are no less impressive.

In all tragedies, from those of ÆSCHYLUS to Punch and Judy, what is involved is power, and in the Verona and other lectures it is plain that Mr. RUSKIN has been meditating over physical as well as moral power, their uses and abuses, until they have become fascinating for him. It seems to us that the key to the contents of the present volume may be found in the passage concerning the locomotive, which he has reprinted *à propos* of some remarks about the mechanical imperfection of animals:—

I cannot express the amazed awe—the crushed humility—with which I sometimes watch a locomotive take its breath at a railway station, and think what work there is in its bars and wheels, and what manner of men they must be who dig brown ironstone out of the ground, and forge it into THAT! What assemblage of accurate and mighty faculties in them; more than fleshly power over melting crag and coiling fire, fettered, and finessed at last into the precision of watchmaking. Titanian hammer strokes, beating, out of lava, these glittering cylinders and timely-respondent valves, and fine-ribbed rods, which touch each other as a serpent writhes, in noiseless gliding and omnipotence of grasp; infinitely complex anatomy of active steel, compared with which the skeleton of a living creature would seem, to a careless observer, clumsy and vile—a mere morbid secretion and phosphatous prop of flesh! What would the men who thought out this—who beat it out, who touched it into the polished calm of power, who set it to its appointed task and triumphantly saw it fulfil this task to the utmost of their will—feel or think about this weak hand of mine, timidly leading a little stain of water-colour, which I cannot

manage, into an imperfect shadow of something else—mere failure in every motion, and endless disappointment. What, I repeat, would these Irondominant Genii think of me? and what ought I to think of them?

Here we see Mr. RUSKIN, in spite of his old aversion to railways, meekly admitting the greatness of the engine, the *bête humaine*, and, as it were, compelling art to bow down before science. But his new respect for power becomes even more manifest when shown in respect of art. Who would have believed at one time that Mr. RUSKIN would place GAINSBOROUGH beside CARPACCIO? Yet in the Verona lecture he says:—"I am not able—no man, unless one of their equals, would be able—to tell you whether there is really more strength in GAINSBOROUGH, who can draw a mouth with an undulating sweep of his pencil, or in CARPACCIO, who will take half an hour at least to do apparently a little more." But a greater concession is made when speaking of BELLINI'S callousness in his eagerness to uphold art for the sake of art, and his indifference whether "people are martyred or not, so long as one can make a pretty grey of their gowns and a nice white of their sleeves and infinite decoration of forest leaves behind." Mr. RUSKIN adds:—"I used to think all this very wrong once, and that it meant general falseness and hardness of art, and so on. It means nothing of the kind. It means only that one's whole soul is put into one's work, and that the entire soul so spent is healthy and happy and cannot vex itself with questions, cares or pains." After this no one will be surprised to find CORREGGIO mentioned as one of the representatives of the highest art.

What is of infinitely more importance to Mr. RUSKIN, as it is to the world, is the phenomena presented by force or power when subjecting itself to the dominion of law. The greatest of all the Titans according to him is THEIA, for "she is the origin of light and harmony; the embodied 'Let there be light' of the heathen world." Accordingly he makes us admire the Lombards of Verona, for they were men of vigorous nature, who intimately realised that force was more effectual when it was disciplined, and took care that no glimmering of light should be wasted. Their dragons, lions and no less fierce human figures become in fact symbols of the wild times when they were carved. As he says in the first lecture:—

The Lombardic period is one of savage but noble life gradually subjected to law. It is the forming of men, not out of clay, but out of splendid wild beasts often as gentle as they are wild, but of unconquered animal nature. And all art of that date in all countries, including our own Norman especially, is, in the inner heart of it, the subjection of savage or terrible or wilful and wandering life to a dominant law. It is government and conquest of fearful dreams. There is in it as yet no germ of true hope, only the conquest of evil and the waking from darkness and terror. . . . If with this sympathy, you look at their dragon and wild-beast decoration, you will find that it now tells you about these Lombards far more than they could know of themselves. You may smile at my saying so: but all the actions, and much more the arts tell to others, not only what the worker does not know, but what he never can know of himself, which you can only recognise by being in an element more advanced and wider than his. And then also remember, even in deliberate symbolism, the question is always, as I have several times lately had to urge—not what a symbol meant first or meant elsewhere, but what it means now and means here. Now this dragon symbol of the Lombards is used of course all over the world; it means good here, and evil there; sometimes means nothing, sometimes everything. You have always to ask what the man who here uses it means by it. Whatever is in his mind, that he is sure partly to express by it; nothing else than that can be at all expressed by it. An angel to Angelico is an angel indeed; to Correggio it is a cupid; and a creature with eagle's wings and lion's limbs is to a Hebrew a cherub, to a Lombard a griffin.

The master of the Guild of St. George must have often pondered over the subject, and have asked himself why men are less eager than formerly to combine for the attainment of a common end? It has been so often explained as to become trite that men have not only individual interests, but from being units in a living mass duties arise which must affect their individuality. The Lombards, with all their fierceness, recognised the idea of the common good. At another period it inspired the Benedictines and Cistercians, as Mr. RUSKIN explains in his chapter called "Mending the Sieve." The sieve in question should be glorified or made a constellation by agricultural implement makers, for in the fifth century the founder of western monarchism treasured it, and by its use helped to keep himself from becoming a solitary, and set an example which the Benedictines still respect by experiments in farming

* *Verona and other Lectures.* By John Ruskin, D.C.L., LL.D. With Illustrations from Drawings by the Author. (London and Orpington: George Allen.)

which are not always profitable. The mending of the sieve, according to Mr. RUSKIN, is just as important in St. BENEDICT'S life "as the killing of the Nemean lion in the life of HERACLES." When chaos appeared to have come again, the monks preserved the world from degeneration. HALLAM acknowledges that we owe the agricultural restoration of a great part of Europe to them, and wherever they came, says SOAME, they converted the wilderness into a cultivated country. Mr. RUSKIN quotes what is said by VIOLET-LE-DUC about their labours in opening out the forests, directing the water-courses, and founding monasteries surrounded by workshops, which became centres to the peasantry of moral force and protected industry. Mr. RUSKIN describes the two great branches of the Benedictines by saying that "Cluny was founded for the schooling of the rich and Cîteaux for the help of the poor." Both exercised the greatest influence on the arts. The early Benedictine churches, according to Cardinal NEWMAN, corresponded with the simple, poetical, pastoral life of the brethren:—

The Benedictine made his way into the labyrinthine forest, and he cleared just so much of space as his dwelling required, suffering the high and solemn trees and the deep pathless thicket to close him in. And when he began to build, his architecture was suggested by the scene—not the scientific and masterly conception of a great whole with many parts, as the Gothic style in a later age, but plain and inartificial, the adaptation of received fashions to his own purpose, and an addition of chapel to chapel and a wayward growth of cloister, according to the occasion, with half-concealed shrines and unexpected recesses, with paintings on the wall as by a second thought, with an absence of display and a wild irregular beauty, like that of the woods by which he was at first surrounded.

When the almost idyllic life of the earlier brethren was supposed to be too easy, and when the scholastic philosophy had attempted some approach towards modern science, a more severe and unified style of church building became necessary. The first settlers at Cîteaux probably cared as little about architectural styles as the deluded victims in the American Eden which is described in "Martin Chuzzlewit." Mr. RUSKIN tells us that for the first Cistercians "the marsh of Cîteaux was too deadly, and they died, and died, nameless people, foolish people, what you choose to call them; yet they died for you and for your children." Then St. BERNARD came with his brothers and friends, and under his influence the Cistercians increased in Cîteaux and elsewhere; "in less than twenty-five years there were more than sixty thousand Cistercian monks at work on any bit of trenchable ground they were allowed to come at between the Bay of Genoa and the Baltic." How Mr. RUSKIN would rejoice if on the roll of his guild there was a tithe of that number.

St. BERNARD was a ruler of men, but there was nothing of the artist in his nature. In his hymns we see the Mediæval rhetorician rather than the poet. But as a logician he wished to have consistency in all things. His monks bound themselves to a life of severity; why should they expect to worship in churches where painting or carving gratified the eyes? Those who admire the Cistercian style forget that it was intended to correspond with the ideas of men who were well drilled and could see the relation between severity and fitness. The churches were not intended to attract the multitude of sinners by suggesting that the religious yoke was easy; they were built for the use of ascetics who had renounced all pleasures which are derived from sight. A man like Mr. RUSKIN, who could discourse eloquently on the beautiful things which the world contains and on the representation of them by artists, would be looked on with terror if he sought refuge in a Cistercian monastery, and be exorcised like the Nightingale of Basel of which HEINE speaks. Yet so strong is the influence which the power of St. BERNARD and his followers can still exert on susceptible minds, we find Mr. RUSKIN, who at one time would have held it to be a sort of religious duty to compel the masonry of churches to recall the flowers of the fields and the sweet singers above them, has brought himself to believe that in all that relates to the externals of worship we cannot have too little nature or too much geometry. The following remarkable passage will, we fancy, produce a saddening effect on those who are well acquainted with the author's writings:—

I do not think the readers of the essays on architecture, which of all my writings have had the most direct practical influence, will think their hour misspent in enabling me personally to ask their pardon for

the narrowness of statements into which either their controversial character or the special direction of my earlier studies hurried me. Of which faults, one of the chief lay in the depreciation of ecclesiastical influence, and the strong insistence on the national styles of civil building, into which my dread of ritualist devotion in the first place, and in the second my too sanguine hope of turning the streets of London into the likeness of those of Nuremberg, provoked or tempted me. It is indeed perfectly true, and I have nothing to retract from the distinctness of the assertion, that Gothic architecture is not, in the total spirit of it, more devotional than humane; that all the beautiful forms of it will condescend to the simplest domestic comfort, and that the luxurious and insensate splendours of it are as much forbidden to the church as to the palace and the council hall. But also it is true and salient among the noblest truths which illustrate the nature of man, that as the visionary faith of the Franciscans purified and animated the art of painting from its Roman pollution and its Byzantine palsy, so the modesty and valour of the Cistercians, subdued by the severe lessons of St. Bernard, and restricting itself always to the use of materials nearest to their hand, produced types of rational and beautiful structure of which the remains, in an age of iron, are still held sacred to the memory of the Catholic Church, and can scarcely be used in a civil building without a sense of profanity. The severe lessons I have said, admitting the popular impression of them. The loving lessons had been a juster word. He was the first of the noble Puritans in the rejection of all that was unseemly, luxurious or vain in the pretended service of God.

If any friend were to express surprise to Mr. RUSKIN about the foregoing passage, we suppose he would say that the work of the Cistercians might not have attained more success than the work of St. GEORGE (the two having many qualities in common) if in Cîteaux and Clairvaux there had been any allowance for the vagaries of the human mind. The doctors said that "I went mad," wrote Mr. RUSKIN once in "Fors," "from overwork. I went mad because nothing came of my work." He did not realise that in the twelfth century entertainment could be sternly rejected, while in our degenerate days a prophet would not be valued unless his message was supposed to be entertaining. All the world's a stage, and the wisest must take their turn in affording amusement. The Cistercians contrived to consolidate men's fears into power which was beneficial to Europe; under guidance as shrewd, perhaps, modern frivolity might also become a source of strength, or be made to serve some purpose that would be considered as exalted. What is feasible without any disruption of society is, however, suggested by Mr. RUSKIN at the close of his Woolwich lecture, when he says:—"While we live, the defence and prosperity of our country depend less even on hearts of oak than on hearts of flesh; on the patience which seeks improvement with hope, but not with haste; on the science which discerns what is lovely in character and honourable in act, and on the fine art and tact of happy submission to the guidance of good men and the laws of nature and of heaven."

The volume, as may be concluded from the extracts, is suggestive of the *Mannigfaltigkeit*, or multiplicity of talents, by which Mr. RUSKIN'S Teutonic origin is revealed. He appears in it as a geologist, an economist, a moralist, an artist, a poet, and his remarks on law and legislation are as acute as those on embroidery or the regulation of mountain streams. In spite of all efforts at plainness, the style is as delightful as ever. The illustrations have a new interest, for they show the adaptability of Mr. RUSKIN'S drawings to the modern processes of photographic reproduction.

LANDSCAPE PRESERVATION.

AT the recent meeting of the National Trust for Places of Historic Interest or Natural Beauty, held at Grosvenor House, the following resolution was unanimously adopted:—"That this meeting is strongly of opinion that land left to the nation for purposes of enjoyment, or as possessing historic monuments, should be exempted from estate duty, and respectfully urges the Chancellor of the Exchequer to extend to real estate the clause which he has undertaken to insert in the Finance Bill exempting from duty works of art and antiquities bequeathed to the public." The Duke of Westminster has now received from Sir W. V. Harcourt the following letter:—
11, Downing Street, Whitehall, S.W.: July 17, 1894. Dear Duke of Westminster,—I have much sympathy with the objects of your meeting of yesterday. Your resolution, however, arrived this morning after the report stage of the Budget Bill was closed, so that it was not possible to make any provision for it in that Bill. It is a subject, however, which will, no doubt, come up for consideration in future years.—Yours truly, W. V. HARCOURT.

THE CATHEDRAL OF YORK.

THE twenty-eighth annual meeting of the Yorkshire Archaeological Society was held in York on July 18. The first visit of the members was to the cathedral, where Mr. J. T. Micklethwaite acted as guide. He pointed out how, from the time of the Saxon church, begun by King Edwin in the seventh century, the original design of the first edifice had been developed in those that superseded it, until the magnificent pile of buildings now witnessed was formed. That such was the case was proved beyond doubt in the enormous width of the nave of the first church. As time went on efforts were made to make the chancel, which was originally very small, in keeping with the width of the great nave. The chancel having been brought into proportion, it was necessary to widen the transepts. Each superstructure, however, was carried out in order to complete one harmonious whole, and though there were necessarily changes in detail, the essence and design of the work were practically the same. Thus the relative dimensions of each new member of the cathedral to the one which it had superseded were brought into direct comparison. It was shown how the gradual changes by which the Norman cathedral was converted into the existing cathedral were worked out. There was first a new choir, secondly a pair of new transepts, thirdly a new nave, and lastly a second new and still larger choir. And these successive additions exceeded the former portions not merely in length, but also in breadth. Special attention was called to the unique character of the stained-glass in the cathedral windows, much of it being very old and but little worse for the fires it had been subjected to. The magnificence of the chapter-house, which was next visited, conveyed an idea of the rivalry that is said to have existed among the great cathedral chapters of the country as to which of them should possess the finest chapter-house. In gorgeousness York chapter-house would be hard to excel, and that in the opinion of its founders it would be positively impossible to do so may be gathered from the device which greets the eye as one enters:—"Ut rosa flos florum, sic est domus ista domorum." The chapter-house claims to stand unrivalled amongst English chapter-houses. The great east window, one of the glories of the cathedral, attracted special attention. This remarkable window, which is often referred to as a history of the Bible in miniature, is the largest window in England, or probably the world, containing its original glazing. In the lady chapel, which fronts this east window, are the monuments of several of the archbishops of the see in the seventeenth and eighteenth centuries. In alluding to the pastoral staffs that apparently lay alongside of them, Mr. Micklethwaite observed that it seemed clear that these staffs or croziers were used in those centuries, although it was difficult to ascertain anything definite about that particular period. It was easier to obtain accurate information concerning earlier centuries than those comparatively recent times. Still another proof of the use of croziers about the time in question was the fact that on the introduction of the Church to America its bishops had staffs, and it was hardly likely that such an innovation would have been attempted in America if the practice had not been in existence in England. After paying a visit to the crypt the party proceeded to the vestry, where the Minster plate was exhibited and described by Mr. W. H. St. John Hope. Amongst this collection were a number of ancient chalices, a silver pastoral staff, the signet rings of Archbishops Sewal, Grenfield and Bowet. Other curiosities in the vestry comprised an ancient coronation chair, the Maser Bowl or indulgence cup of Archbishop Scrope, and the famous horn of Ulphus—a valuable relic of ancient art, and said to form the title by which the chapter still hold several of their estates.

NATIONAL ART TRAINING SCHOOL.

THE prizes won at the National Art Training School during the sessions of 1892-93 were distributed by the principal, Mr. John C. L. Sparkes, on Tuesday. The following medals and prizes were gained by the students in the national and local competitions and in examinations in 1893:—Five gold, 38 silver and 47 bronze medals, 127 national competition books and 19 Queen's prizes; general students—one gold, two silver and seven bronze medals, 10 national competition books and three Queen's prizes; students in training, national scholars and free students who take honorary awards—four gold, 26 silver and 40 bronze medals, 99 national competition books and 16 Queen's prizes; local competition, open to students of the schools only—10 silver medals, 18 national competition books and four prizes of lower value; at the third grade or highest art examinations 34 art certificates were obtained by students in the National Art Training School; at the elementary examinations in May 96 students obtained 109 passes first class and 44 passes second class, seven obtained the elementary drawing certificate and one the second grade certificate, and 21 art class teachers' certificates were taken.

Mr. Sparkes in his address to the students said that great school was occupied mainly in providing education in practical art to men and women, who in some near future would be the teachers of what they now learnt, and it thus had an influence differentiating it absolutely from all other schools in the country, and indeed from any others in Europe that he knew. In its double capacity as a training school for teachers and a practising ground for designers, with access to a museum like that at South Kensington, it also held a singular position. Its importance made it an object of criticism, especially from those who really knew nothing about the matter. The favourite taunt was that schools of art in general, and the National Art Training School in particular, were producing painters of poor pictures and sculptors of equally poor statues. But there was something to be said in favour of the training that had attracted such artists as Clausen, Woods, Fildes, Clara Montalba, Shannon, Llewellyn, Menpes and Frank Short, to mention no others. Their friendly critics, on the other hand, were usually directors of art schools abroad or writers in the art papers of Europe, or foreign manufacturers who had taken the trouble to visit this country to see for themselves. As a rule they paid a generous tribute to the work of that and the affiliated schools. Many of our home manufacturers bore similar testimony. It was acknowledged abroad that English design and taste were leading in the race, notably in furniture and surface decoration. It would be misleading to say that all the great increase of taste in England was the clear product of these schools; equally would it be unjust to ignore the marked influence which they exercised.

THE TEMPLE OF PHILÆ.

THE following letter has been addressed to the Earl of Kimberley on the subject of the proposed reservoir on the Nile:—

My Lord,—The great interest which we, the undersigned, take in the history and archaeology of ancient Egypt induces us to respectfully address your lordship on the subject of the proposed erection of a reservoir on the Nile.

The importance of Egypt in the history of civilisation is now so fully recognised that we feel that we may rely upon your lordship's sympathy in the consideration of any means whereby injury to or destruction of the ancient monuments of that country may be avoided, without in any way hindering the material development of the land.

In the consideration of the several schemes recently put forward for the formation of a reservoir, it appears that some important points have not yet received the notice which we venture to think they demand.

1. The construction of a high-level dam at Aswan would submerge the region of Nubia nearest to Egypt, and ruin the temples of Debod, Gertasseh, Tafah, Kalabsheh, Dendur, Dakkeh and Offa ed Dunya, as is shown by the levels of those temples recorded by the Egyptian engineers on the maps of their report; it would also ruin the forts of Kostemneh and Kubban, and the towns, cemeteries and various other remains of this region, beside leading to the ruin or removal of the various temples of Philæ. Such a dam would be the most destructive of any that have been suggested.

2. It has been pointed out—from an intimate knowledge of the details of the cultivation—that it would be impossible to utilise all the water of so great a reservoir for many years to come. The industrial as well as agricultural conditions of the country will need to be largely modified before they will require so great an increase in the water supply; and this modification can only be gradually effected. Hence it would seem to be preferable to adopt some scheme which is capable of expansion, and which would not entail the whole expenditure long in advance of the result.

In view of this, proposals have been made for constructing a lower dam at an available point, with the addition at a later period of another above it, possibly in the Soudan; or for building the lower part of a large dam at a point where it would effect the least injury, and afterward increasing its height as the requirements develop.

3. If a single dam should be decided on as being the most beneficial, no necessity has been shown for its erection at Aswan. Though that site may be the most convenient, yet the facts stated in the report on perennial irrigation show:—

That a dam at Kalabsheh would insure exactly the same benefits to Egypt;

That, according to the fullest estimates of Mr. Garstin, it would cost about the same amount, after fully allowing for all difficulties of construction;

That the site at Kalabsheh is "geologically a good one";

That the required depth of the foundations of the dam, though presenting difficulties, would be much less than that attained in work already executed;

And that, even if more immediate expense were incurred by placing a dam at Kalabsheh rather than at Aswan, the estimated profit from it is so great that the gain accruing to the

country in only a few weeks would balance any additional expenditure attaching to a scheme which would have the merit of sparing the threatened antiquities.

Without, therefore, any desire to intrude on the technical considerations of the various subjects, whether of one dam or several, and without presuming to suggest any one course of action in particular, we venture to call your lordship's attention to the statement of the engineers whose proposals show that there is at least one feasible alternative to the placing of a great dam at Aswan—an alternative which seems in every way as good for the country, one which is certainly far less injurious to the interests of history and archaeology. Whatever it may be needful to sacrifice for the material prosperity of Egypt, surely the sacrifices demanded for a great reservoir at Aswan are uncalled for if equal benefits can be otherwise obtained for the same cost, and with far less destruction of the permanent glories of the land.

Among the signatories are Sir Frederic Leighton, Mr. Poynter, Professor J. H. Middleton, Sir Wollaston Franks, president, and Mr. Hilton Price, director of the Society of Antiquaries; Mr. Drury Fortnum, Mr. Maunde Thompson, principal librarian of the British Museum; Viscount Dillon, president of the Royal Archaeological Institute; General Pitt-Rivers, Sir Henry Rawlinson, Mr. Arthur Evans, keeper of the Ashmolean Museum, Oxford; Dr. E. B. Tylor, keeper of the University Museum, Oxford; and Dr. Flinders Petrie, professor of Egyptology, University College, London.

ANTIQUITIES FROM KOPTOS.

AN exhibition of remains discovered by Professor Petrie during the early part of this year is now open in the Edwards Library of University College, Gower Street, and will be on view until September 1. The site which was selected for exploration was that of the important town of Koptos (now represented by Kufu), about thirty miles north of Thebes, which formed the Nile termination of the oldest trading route of the world, the roadway passing through the valley of Hammamat to the shores of the Red Sea. Tradition had always pointed to Koptos as being one of the first settlements founded by the dynastic Egyptian immigrants when they arrived from their home in the sacred land of Punt in south-western Arabia. The site of the temple has been thoroughly cleared, and the result has been the discovery of no less than six successive temples, ranging from the most remote prehistoric time to the age of the Ptolemys, and the recovery of hundreds of objects of the greatest interest and of the memorials of thirty-four rulers of Egypt. The objects, however, in the collection which will excite the most interest, says a correspondent of the *Times*, are those which deal with the prehistoric age in Egypt. Hitherto Egyptian art and civilisation have presented a striking paradox. The farther back we go the better the art, the more simple and yet perfectly developed the social life. Beyond the age of Senefru, the builder of the pyramid of Medum, there was no trace, no earlier records, of the beginnings of the social life of that period. In the lowest strata of the temple at Koptos the explorer has discovered remains of an ancient settlement, which for the first time reveal to us prehistoric Egypt.

There is on exhibition here the massive head of a statue which is one of three figures found at a great depth beneath the Ptolemaic temple, statues of 13 feet high, and which are little more than long truncated cones, the arms and legs being simply indicated by hammered out lines, and the ears and whiskers in the same manner. There is not the slightest trace of chisel-work upon the whole. Around the waist of each are girdles upon which are a series of curious drawings, evidently the Totem figures of the god of the primitive people. These, then, are probably the first statues of Min, the god of Koptos. It is important to notice that the face is in no way indicated, and was probably represented by a wooden mask. This seems very possible when we remember that Bes, the distinctly Punite god, is always represented as wearing a mask, and that he was the god of laughter and dancing; and one of the principal features in the worship of Min was dancing, as we have a representation here of Usertesen I. dancing before Min. The rough sculptures which adorn the bands and girdles upon the figures have been very carefully cast and are exhibited here. The first is the fetish pole of Min, represented by an upright staff with a bouquet of flowers at the top and surmounted by an ostrich feather; and hung round the pole are offerings consisting of pteroseras shells and swordfish. On another we have a representation of the elephant, while the best and oldest of them is a remarkable drawing of the head of a gazelle. It will at once be seen that these objects serve to connect the early settlers with the shores of the Red Sea and the district of Somali land, where the elephant would be known to them. The connection, then, between Arabia and the dynastic Egyptian is no longer a theory, but an established fact.

Another series of objects which will be of especial interest to archaeologists is a collection of rude pottery made of coarse Nile mud, but carefully polished with red hematite. There is little doubt that the work here belongs to the period of the first or second dynasty, as the representation of a dog with a peculiar rope collar, which is modelled on a large oval stand, is never found after the time of the third dynasty. These fragments, however, show considerable artistic skill, and indicate that the secret of the perfection of Egyptian art in the fourth and fifth dynasties is to be ascribed to a school of artists who had learned to model in clay. The same finish which they had been able to impart to the plastic clay they continued to use in soft stone, wood and, later, in the hardest materials. It is this existence of the pottery work which explains the peculiar conventions of stone sculpture, the placing of the legs forward, the uniting of them by a slab or stiff pier at the back of the figure, which would all be required when the artist was working in a yielding material such as clay.

Passing now to the prehistoric period there are many objects to be noticed, an alabaster vase inscribed with the cartouche of Kufu, the builder of the first pyramid being the earliest. It is, however, from the period of the eleventh and twelfth dynasties that the most valuable work is obtained. Hitherto there has been no temple sculpture of the period of the eleventh dynasty, the age of the Antefs. Antef V. built the temple of Koptos of brickwork faced with stone, and several fragments of his work have been recovered. This is extremely important, as hitherto no sculptures of this monarch have been brought to Europe. They are in excellent preservation and the hieroglyphics are cut with the most minute care. They seem to have been removed during the period of the twelfth dynasty and turned face downwards to form a pavement, and thus they have retained all their sharpness during these many years. It is curious to see during the period of the Antefs dogs most frequently occurring in the sculptures, sometimes pet dogs, but usually hunting dogs. This is probably due, as Professor Petrie suggests, to the fact that Egypt not being powerful enough to be aggressive at this period, the nobles devoted much attention to hunting and thus the dogs became great favourites of their masters and were represented on their monuments. Of the period of the twelfth dynasty there are two of the finest pieces of work which have ever reached this country—one a figure of Usertesen I. dancing before Min; the other a representation of Amenemhat standing before Min. The former of these is in intaglio; in the latter the hieroglyphics are raised. The delicate finish, attention to the minutest details, and above all the excellence of the material render them the gem of the collection. There is a very interesting inscription of the period of the eleventh dynasty which records the deposing of the Prince of Koptos for treachery and the installing of a new family in his place. This was done by means of a Royal Commission, the names of each of its members being given. Special decrees are made as to the family deposed, and punishments for persons who in any way communicate with them.

On one side of the room are exhibited an important series of objects forming the foundation deposits of the temple at Koptos built by Tothmes III. These deposits were found in pits under the centres of the wall placed at the bottom of the pit, the upper part being filled in with hundreds of vases. The deposits consist of bronze models of tools, knives of various sizes, narrow chisels, broad chisels, axes, all of them in miniature and inscribed with the words "Tothmes, beloved of Min of Koptos." A number of model corn-rubbers were also found in each deposit, made of sandstone and inscribed with blue paint. The object of these toys (as we may call them) apparently seems to have been that the *kas* of the workmen represented by the tools might for ever be employed in restoring the carved temple. In exploring the Ptolemaic temple Professor Petrie found also the deposits placed there. These seem to consist principally of representations of the materials used in the construction of the temple—pitch, alabaster, basalt, copper, lead, made bricks, plaques of red glass, ingots of lead and copper, and small gilded limestone plaques evidently representing gold. It is very curious to notice that an almost similar deposit was found in the palace of Sargon, King of Assyria, B.C. 722, at Khorsabad.

From the Ptolemaic temple come several objects hitherto unknown. Three tanks having fourteen steps on each side ascending and descending from and to the water, are exhibited. These are evidently models of the sacred tank of Min, and one of them bears an inscription of Aristius Saturninus. The use of these tanks seems to have been for the wealthier persons to perform the ablutions of their hands and feet before entering the temple, and thus to avoid using the great tank of the common herd. At the bottom of one tank is the model of a foot. Among the Ptolemaic fragments are a number of pieces of carving, apparently window frames, one of them having a curiously enlarged representation of the Egyptian symbol of life. The lions' heads which form the water-spouts of the Ptolemaic temple are very handsomely carved. In the portico

of the college are exhibited several objects from the Ptolemaic temple, including a large wall scene of Ptolemy Soter adorning Min. Here also are some fragments from the oldest foundation—a large bird, apparently a hawk (which bears a curious resemblance to the figures found by Mr. Bent in Mashonaland), and some very rudely sculptured lions.

The collection represents the results of eleven weeks' work upon this site, and we may say that it was amply proved how rich a field Koptos was, and how correct archaeologists were in looking for explorations here to solve some of the most difficult problems that have been so long before them.

TESSERÆ.

Correggio as a Painter.

OF chiaroscuro on the grandest scale, as it extends to the regulation of the whole of a work, Correggio was certainly the inventor. Antecedently to him no painter had attempted, or even imagined, the magic effect of this principle, which is strikingly predominant in all that remains of Correggio, from his widely extended cupolas to the smallest of his oil-paintings. Its sway was uncontrollable; parts were enlightened, extended, curtailed, obscured or buried in the deepest shade in compliance with its dictates, and whatever interfered (even correctness of form, propriety of action and characteristic attitude) was occasionally sacrificed. By classing his colours, and judiciously dividing them into few and large masses of bright and obscure, gently rounding off his light, and passing, by almost imperceptible degrees, through pellucid demi-tints and warm reflections into broad, deep and transparent shade, he artfully connected the fiercest extremes of light and shadow, harmonised the most intense opposition of colours, and combined the greatest possible effect with the sweetest and softest repose imaginable. The same principle of easy gradation seems to have operated as his guide in respect to design as well as in colouring and chiaroscuro. By avoiding straight lines, sharp angles, all abrupt breaks, sudden transitions and petty inflexions, and running by gentle degrees from convex to concave, and *vice versa*, together with the adoption of such forms and attitude as admitted this practice in the highest degree, he gave his figures that ease, elegance and flexibility, that imitable grace which, in honour of the inventor, has since obtained the appellation of Correggiesque.

The Pedimented Roof in Greece and Rome.

A bold roof kept up its full height the whole length of the building, or of that part of the building which it covers, and with a visible and well defined termination, is a thing of the same class as an upright bearing of the body, a correct process of reasoning, a well-sustained climax, or a straightforward line of conduct. There happens not to be any minor question of taste and feeling to which the rule of universality more applies. Thus the chorus of birds in Aristophanes (*Aves* i. 110), amongst various golden hopes which it holds out to the judges, promises, very possibly in allusion to some well-known instances of private presumption, that they shall live as it were in temples, for that it will roof their houses with a pediment. Julius Cæsar was allowed by the senate the unprecedented dignity of a pediment to the front of his house, adorned like that of a temple, together with other honours heretofore confined to divinity; and we find the constitutional Roman very justly regarded it with a mixture of religious and political abhorrence (*Cic. Phil.* ii. 43), and Plutarch in his well known list of omens preceding the death of Cæsar, relates that Calpurnia woke her husband the previous night by her cries and groans in her sleep, having dreamt that the said pediment had tumbled down, and that on the strength of this warning she endeavoured to persuade Cæsar to adjourn the senate. There is a remarkable passage in *Cicero de Oratore* (iii. 46) on this very subject. He is arguing the universal law, that all true beauty is founded in utility. Having illustrated it by a very wide and particular induction of the works of nature, from the mechanical system of the universe up to the human frame, he thus proceeds:—"From nature let us pass on to art. What is so necessary in a ship as the sides, the ribs, the prow, the stern, the yardarms, the sails, the masts? Yet they have all so much beauty of form that one would suppose they had been devised not merely for the working of the vessel but also for the gratification of the eye. Columns are necessary to sustain temples and porticoes, yet they are of no less beauty than use. It was not taste but absolute necessity which formed that pedimented roof of the Capitol and other temples. For when it was considered how the water should be made to flow down both sides of the edifice, the dignified form of a pedimented roof was found to agree best with the convenience of the temple, so that even if a temple were built in heaven, where there could be no rain, it would appear devoid of dignity without a pedimented roof." The argument which Cicero draws from the external effect of a rightly-shaped roof applies also with a peculiar felicity to the

form and details of the interior. As the beauty of a ship consists in the graceful adaptation of all its necessary timbers, ropes and spars, so the beauty of a roof depends on a graceful modelling and arrangement of its beams, rafters, purlins and so forth. True beauty disappears and becomes mere grimace and foppery as soon as the notion of utility is lost sight of.

Wren and Bacon.

It was not until the age of Wren that the inductive process of Bacon was duly understood and appreciated. This period, on the eve of Newton's great discoveries, was perhaps the most important that has yet occurred in the annals of science. The spirit of inquiry, at first feeble, which actuated some individuals at the time of the revival of learning, had from numerous causes gathered strength and spread itself over Europe. Bacon had turned his powerful and creative mind to the state of human knowledge, marking its imperfections and planning its improvements, amending the vagueness and uncertainty of physical speculations, and supplying the want of connection between the sciences and the arts. This and the illustration of Bacon's method by Galileo and his contemporaries (amongst whom Wren was eminent), first led the way to the general adoption of the new philosophy—reasoning gradually from particulars to those that were only one step more general; not, as formerly, adopting general positions drawn suddenly from particular instances hastily assumed. It was now felt that facts and not opinions were the things to reason about, in order to arrive at the knowledge of the laws governing the material world; and Bacon himself had foreseen the formation of a society directed to scientific improvement, and has given a general outline of it in the *Nova Atlantis*. And it was now that the enthusiastic ardour in the pursuit of natural philosophy was awakened in the minds of literary men, and which has ever since remained undiminished. None of the members of these meetings were more conspicuous than Wren, who, together with Boyle (the improver of the air-pump), had imbibed the true spirit of Bacon. They applied themselves to the prosecution of experimental science, being the avowed enemies of the philosophy of Aristotle; following up the true principles of the new philosophy by preparing a history of the phenomena of nature in all their modifications and varieties, and instituting every form of experiment for the sake of discovery. Wren was one of the first (in conjunction with Wallis, Huygens, Newton, Leibnitz and the Bernouillis) to occupy himself with the investigation of the cycloid, which had been discovered by Pascal; and he constantly urged, in his communications to the Royal Society, the importance of experiments and observations on facts. "For the improvement of theories," he observes, "we need be least solicitous; it is a work which will insensibly grow on us if we be always doing something in experiment; and every one is more prone to exercise his fancy in building paper theories than patient first to pile the unsure foundation and hew solid materials out of the history of nature: this is rather our task, and in many things we must be content to plant crab stocks for posterity to graft on; and instead of the vanity of prognosticating, I could wish we would have the patience for some years of registering past times, which is the certain way of learning to prognosticate; experiment and reason is the only way of prophesying natural events, in combating prejudices, detecting error and establishing truth."

John Aubrey on English Houses.

Aubrey, writing in the seventeenth century, describes, in his quaint and picturesque way, the characteristics of the old manorial or hall-houses of the times of the Plantagenets and Tudors. "The architecture of an old English gentleman's house (especially in Wiltshire and thereabout) was a good high strong wall, a gatehouse, a great hall and parlour; and within the little green court, where you come in, stood on one side the barne. They then thought not the noise of the threshold ill musique. This is yet to be seen in severall old houses and seates, e.g. Bradfield, Alderton, Stanton St. Quentin, Yatton Keynell, &c." These words are found in a MS. in the Ashmolean Museum, which is the rough draft of, or rather an imperfect collection of materials for, a history of his native county, Wilts. Aubrey begins by what he calls "Chronologia Architectonica," or an inquiry into the history of English architecture. He, however, makes but very little way in this branch of his work, not having even clearly arrived at a knowledge of the relative ages of the circular and pointed arches. The old antiquary's sad and woful regrets after the "good old times" of heritable jurisdictions had their root probably in the destruction of his own hereditary property during the civil wars. The embarrassments which commenced then at length reduced him to complete poverty, in which he died about 1680. "The Saxons," he says, "who succeeded the Romans in this country, were so far from having arts that they could not even build with stone. The church at Glaston was thatched. They lived sluttishly, in poor houses, where they ate a great deale of beefe and mutton, and drank good ale in a brown mazzard, and their very kings were but a sort of farmers. The Normans then came and taught them civility and building."

Criticism of Architecture.

We may judge of details by rule, but the only true method of estimating the excellence of an architectural composition is by the sentiment it produces. It must be acknowledged that this is in some respects an uncertain criticism, as the impression produced depends in part upon the temper of the mind at the time, and even on the feelings of the body. However, we may make allowances, and we may repeat the trial under different circumstances.

Titian and Rubens.

Titian mingled his tints as they are in nature, that is, in such a manner as makes it impossible to discover where they begin or terminate. Rubens's method, on the contrary, was to lay his colours in their places, one by the side of the other, and afterwards very slightly mix them by a touch of the pencil. Now as it is an acknowledged principle in the art that the less colours are mingled the greater their purity and vivacity, and as every painter knows the latter method to be the most learned (requiring a deeper knowledge of the subject), to be attended with a greater facility, and, if properly managed, with greater truth and vivacity of effect, it must follow that this difference in their practice, which has been adduced to prove the inferiority of Rubens to Titian, indisputably proves the reverse. Although it must be allowed, perhaps, that in practice he at times uncovered too much the skeleton of his system, and rendered his tints too visible for a near inspection, there is no doubt that, on the whole, he was the most profound theorist; that more may be learnt from him respecting the nature, use and arrangement of colours than from any other master; and that had he not been in some measure the dupe of his own powers his name would have stood first in the first rank of colourists. Rubens, like other men of his degree of eminence, produced a multitude of scholars and imitators to whom he stood in the place of nature, and whose excellence can only be measured by their proximity to or distance from their great archetype. The best of their works are now probably, and not improperly, attributed to him, from whose mind the principle that directed them emanated. From him they learned to weigh the powers of every colour and balance the proportion of every tint; but, destitute of his vigorous imagination, the knowledge of his principle became in their hands a mere palliative of mental imbecility (leaves without trunk), and served only to lacquer over poverty of thought and feebleness of design, and to impart a sickly magnificence to stale mythological conceits and clumsy forms of gods without dignity, goddesses without beauty and heroes without energy, which disgust the more for the abortive attempt to conceal by colouring the want of that which colour can never supply.

Coupled Columns.

The use of coupled columns is so absurd, and they are confessedly so inelegant that it seems almost unnecessary to proscribe them. Suppose apertures, such as windows, arranged in couples throughout an elevation, with very narrow and very wide piers alternating, and both the absurdity and the inelegance become manifest; now, neither the one nor the other can be lessened or changed by reversing the case, and putting alternately wide and narrow openings, as in coupled columnar ordinances. Columns may with propriety be put further apart when they are attached than when they are insulated, because the entablature, resting in part on the wall, is neither in fact nor in appearance made infirm by the distension, as it would be if it rested on the columns alone. All the parts of the same edifice which come into view under any circumstances at the same time should correspond; but insulated and attached columns of the same ordinance and in the same elevation may, under certain circumstances, without impropriety be arranged with a different intercolumniation.

Choice of Subject in Landscape.

In the first choice of a subject there is some cause that induces our selection of it. Either we see the scene under some peculiar effect of sunshine or of gloom, of mist, of sunset, or of twilight, which makes it strike us with a sense of its beauty, or of its fitness for the painter's art. It may even be some mere accident seen once and no more, a stream of sunshine peculiar to some few flitting moments of time, a group of accessory figures, some mere incident of season or of industry; it may be but a volume of smoke from burning weeds, or the column rising from some cottage chimney when the housewife lights her fire to greet her husband on his return from labour, or higher still, some association that strikes a chord of feeling in the artist's mind. Now the painter must treasure up the incident or feeling that awoke this sense of pleasure in the scene, and must reproduce it on his canvas—or he will find that even to himself, much more to the public, his work will be tame and spiritless. Thus then mere imitation is precluded in practice, and must be assisted by memory. How often do we find that on returning to a scene that had struck us as replete with loveliness, the sense of its beauty is gone, the whole appears dull and commonplace. And why? The sunshine or

shadow, the accident that gave it sentiment, that added life or poetry to the prose, is gone, and the result is lifeless insipidity. Again, the art of the painter may consist either in fixing such fleeting accidents as above alluded to on his memory to reproduce them in the progress of his work, or in imagining like incidents to relieve the insipidity of the subject of his choice—the latter showing the higher gift. All the incidents and accidents we have glanced at as adding interest, sentiment or beauty to scenery are more or less evanescent and fleeting. The ray of sunlight which gave point and glory, light and shade to an otherwise prosaic landscape, passes away ere the painter has fixed his easel or spread his palette—the very sun in running his daily course momentarily changes the scene before him, the cloud passes away and is gone, the figures journey onwards—and he who relies on painting a detailed imitation of what he sees has to paint commonplace, or to bear in memory during his sitting a state of the scene that has passed ere he begins his work, and which is constantly at variance with what his eye rests on. Nay, the most poetical phases of landscape are of all the most fleeting. What, for instance, is so beautiful as sunset?—what so worthy of the landscape-painter's skill? But the sun pillows himself in his cloudy couch of crimson and gold, and draws around him the dim curtain of night, while we are too transfixed with the purple and the molten gold to do more than gaze and admire.

Simplicity in Architecture.

Simplicity and harmony are the elements of beauty in architecture—simplicity in the general form and arrangement of a subject, and harmony in the collocation and combination of its various parts. Without these qualities a structure can never possess either dignity or grace, and with them it will certainly possess the attractions of both. The outline, then, most conducive to beauty in architecture is that which bounds the most simple forms. These are the parallelogram and pyramidal, in which the lines are straight and uninterrupted throughout their whole length. The ancient monuments of Egypt, of Greece and of Rome offer the most complete exemplifications of this. No other than the long unbroken line which bounds the temples of Egypt could produce an effect so grand, and no other than the simple, square and pyramidal forms could be productive of so much dignity as they possess. In the pyramids and obelisks of the same country the effect of this simplicity is even more obvious. In the temples of Greece, again, the same dignified simplicity is still predominant, for although in them the parallelogram and pyramid are combined, they are not confused, their mass consisting of a parallelepipedon whose ends are surmounted by vertically faced pyramids, connected by an unbroken line of ridge running parallel to the horizontal boundaries of the sides. Those of the Roman monuments which are deficient in simplicity are also deficient in beauty. Such are the triumphal arches, whose general form is broken by columns and arches which subject themselves to no commanding outline, but are all at the same time prominent features of, and excrescences from, the general composition. In the temples which are on the Greek model it is not so, nor is it so in the long series of arches in the Roman aqueducts, which are crowned and connected by commanding lines, unimpeded by projections or protuberances of any kind. The crucial form of the Pointed cathedral may be thought to detract somewhat from its simplicity and so much from its beauty; but it is an aggregation of simple forms, perfectly coherent with the tendency of the leading lines in the style which, we have seen, is vertical, and the lines are therefore not broken by the projected masses of the transepts, as they would be in the Egyptian and other styles, the tendency of whose commanding lines is horizontal. Otherwise the Pointed cathedral is a modification merely of the form of a Greek temple, with other parallelogramic forms added to it, as towers, or pyramidal, as spires. The same principle will be found to pervade the best works of the Italian school, more or less modified according to its application.

San Miniato, Florence.

The interior is remarkable for its pure and perfect Roman style. Triplets of fine arches rise from Corinthianised capitals. In the construction there is an important architectural peculiarity. Large arches are thrown over the nave, connected with smaller arches which are thrown over the aisles, assisting to support the roof, binding the whole fabric together and giving it additional strength. When these arches occur the pillars are exchanged for compound piers, one shaft of which is carried up to meet the arch they sustain. Above this is the roof of wood, as in the Roman basilicas, crossed with painted beams and open to the rafters. Beneath the mosaic in the apsis are the windows, apertures in the stone wall, each filled with a single slab of translucent alabaster—one of the classes included in the genus of the lapis specularis of the ancients; as far as we can ascertain, they are the only surviving examples of this most ancient mode of illumination. In the morning, when the sun shines on them, they diffuse a cloudy roseate beam; at other times of the day they are nearly obscure.

NOTES AND COMMENTS.

THE safety of St. Paul's Cathedral in case of a fire concerns more than England. It is therefore satisfactory to learn on the authority of Mr. PENROSE, the "surveyor to the fabric," that care has been taken to insure an ample supply of water independently of what is obtainable from the mains of the New River Company. A considerable body of rain water is always stored in tanks immediately under the ball and cross, with fire hose and proper arrangements for discharging it upon any part of the dome which might be threatened. There is also a much larger supply at the foot of the dome, and a powerful fixed force-pump to communicate between the two. Arrangements are made for distributing the water from these tanks to any part of the main roof. It is believed that there is enough storage to keep the external leadwork sufficiently cool to prevent the roofs taking fire in the supposed case, until the steamers of the Fire Brigade could replenish the storage from the mains. There is also telephone communication between the Cathedral and the Fire Brigade station. Wood and lead, which are so largely used in the upper parts of the building, are not fireproof materials, but at St. Paul's the wood is generally oak, which Sir E. M. SHAW prized above many materials for its resistance, and the lead is much thicker than that commonly employed in our time.

AFTER taking time for reflection and for examination Mr. Justice COLLINS has given his decision in the action taken against the Bowness Local Board in order to prevent the sewage of the town from entering Lake Windermere. The Rivers Pollution Act of 1876, while prohibiting acts of the kind, provides that if the person or persons causing the offence can prove to the Court that the best means to prevent sewage entering a stream had been employed, then the penalties could not be enforced. The Bowness Local Board pleaded that they had complied with the conditions prescribed, and that the sewage was so transformed and purified by the processes to which it was subjected that it could not be described as sewage when it entered the lake. That was satisfactory; but the question was, according to Mr. Justice COLLINS, whether what was done could be described as the best means available. Now it was given in evidence that the Board proposed at one time to purchase more land in order that the purification could be improved, and the scheme was approved in London. But before any steps could be taken an election occurred and the advocates for improvement were defeated. The Judge, therefore, considered that something more could be done. He made an order requiring the defendants to abstain from the commission of the offence—that was, to abstain from sending any sewage into the lake without using the best practicable and available means of rendering it harmless, but the order is not to take effect for at least six months. His lordship advised the Bowness Board to obtain the certificate of the inspector under the Local Government Board, which would be the best evidence they could have, and they would then be absolutely secured from any interference. The decision is likely to raise the hopes of rival patentees who have invented processes of sewage purification, for as long as it can be stated that some means which is likely to produce a more satisfactory effluent remains untried there is a chance for litigants. One of the witnesses in the Bowness case said the effluent after his process would be sparkling, and there is little doubt the Judge was impressed by the word, especially when he saw what was being poured into Windermere. But if legislation is to continue until sparkling sewage is obtained, lawyers will enjoy a prosperous period.

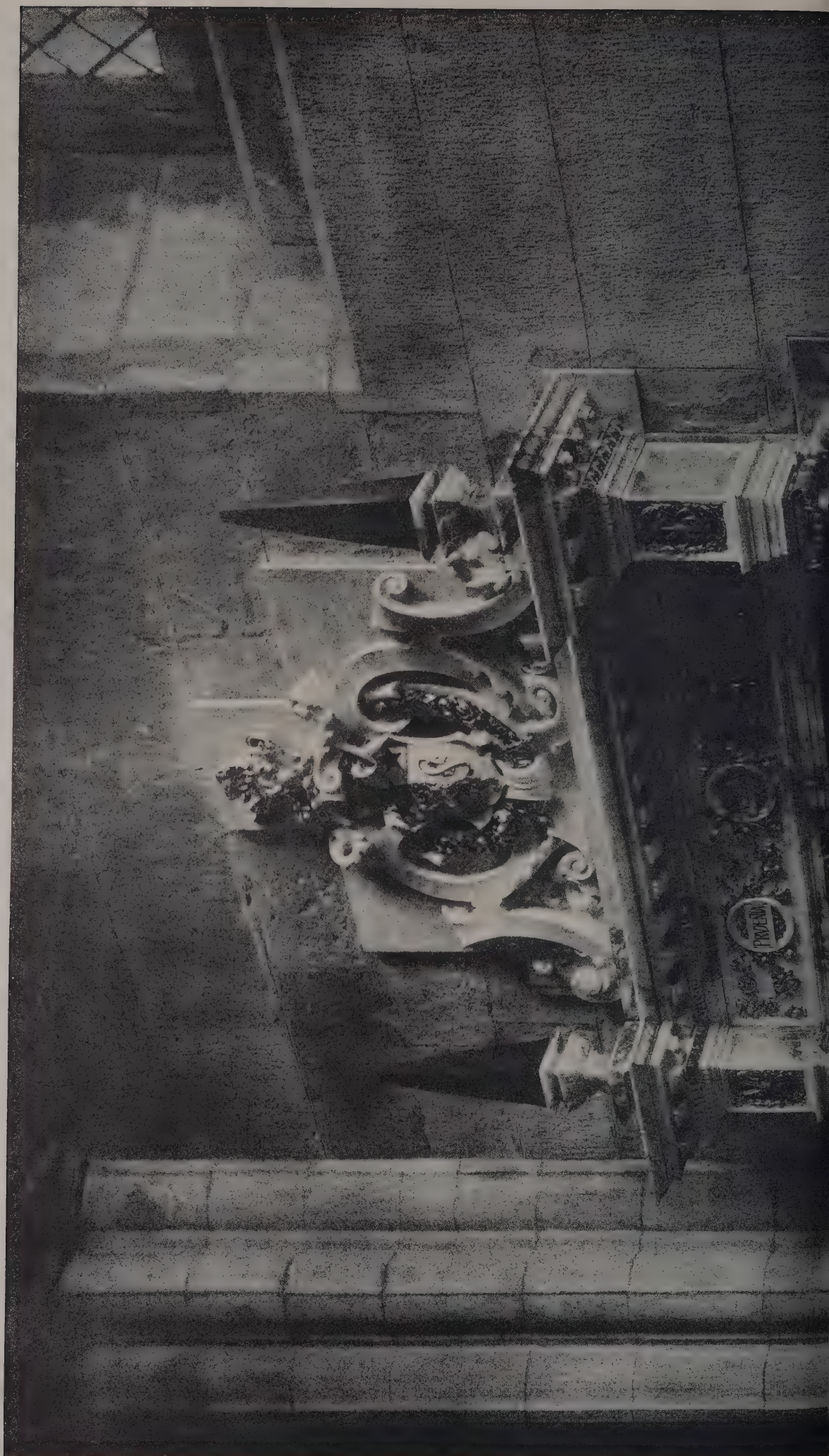
THE history of church bells presents many remarkable incidents, and the parish of St. Michael's, Coventry, has added another which appears to be unique. As has happened elsewhere, the bells caused strains which the tall steeple could not resist, and in consequence there was a costly restoration. During the operations the bells were removed, and there were apprehensions that if they were allowed to swing uproarious as of yore another restoration

would be inevitable. As COWPER says, there is in souls a sympathy with sounds, and some of the parishioners appeared to be afraid they would cease to be devotional unless they were called to prayer regularly by the old chimes. Accordingly it was resolved to erect a lofty campanile in order to provide for the bells. Some of the promoters of the restoration were dissatisfied because the scheme had assumed a new character, and withdrew their support. But, on the other hand, promises were made which denoted remarkable munificence. One gentleman, the late Mr. WOODCOCK, appeared prepared to pay a sum which is described as varying from 5,000*l.* to 35,000*l.* His death caused the collapse of the campanile project. The bells are still on the ground, affording amusement to young campanologists, who are able to kick occasional sounds out of them, and there is no money to raise them to their old position. Mr. J. O. SCOTT, who had charge of the restoration, considers that, while it would be very unwise to ring the bells in the steeple, there is no danger in chiming, and with that opinion Messrs. TAYLOR agree. The simplest course under the circumstances would be to subscribe the two hundred pounds which are required for the rehanging, and for an important parish like St. Michael's that end ought to be soon attained. But, strange to say, some of the parishioners have a hankering after the campanile, while others profess to care little for bells that are not in full swing. The peculiar circumstances of the restoration and the disunion which the bells caused have left a balance of about 800*l.* still owing on account of the work done, for which some members of the committee are liable. There are other debts also. It is proposed to hold a bazaar to raise money, but as the debt must first be cleared out of the sums received, it would appear that the bells are likely to remain a long time before they can be raised above the commotions of St. Michael's parish.

IT is not often the Society of Antiquaries interferes with building schemes, but if ever such a course of action was justified it is in the case of the Bath Pump Room annexe. The new building cannot be carried out without the destruction of Roman masonry. In itself that is a sacrifice to be regretted, for a piece of work measuring 20 feet by 30 feet is not everywhere to be found. It should, however, be remembered that archæology is becoming a progressive science, and that problems may arise hereafter which would be determined more readily with the aid of the evidence which the baths committee have doomed to destruction. There might be some slight excuse if the annexe could not be constructed while so much Roman work remained. But nobody on the Town Council would be bold enough to adopt that theory, and there is enough architectural skill among us to get over any difficulty which the ancient work may offer in dealing with the site. The Bath Town Council unfortunately cannot bring themselves to imagine that they have a trust which it is their duty to carry out faithfully for the sake of posterity. They take a commercial view of the case, and as respect for archæology may entail an expense of a few pounds, it is not recognised in the arrangements. One of the aldermen, when the letter from the Society of Antiquaries was submitted, said that "the baths committee were quite able to look after their own interests"—an ominous expression, which probably means further sacrifices of antique work in Bath, with architects as the directing operators.

ON Saturday the French Académie des Beaux-Arts distributed the money available for the Prix Bordin in a novel manner. It was found that none of the work submitted was worthy of the prize. Accordingly it was decided to give a part, amounting to 2,000 francs, to M. PAUL RICHER as a reward for his book, "Anatomie Artistique." M. ROCHEBLAVE was awarded 500 francs for his monograph on "Les Cochin," which was noticed at some length in *The Architect*. M. CHARLES YRIARTE obtained a similar sum for his work, "Matteo Civitali." The recompense of the Académie will be advantageous to the authors, as it is a recognition of the merits of their works.

The Arrest, July 27th 1894.





PHOTOGRAPHED BY BEDFORD, LEWERS & CO

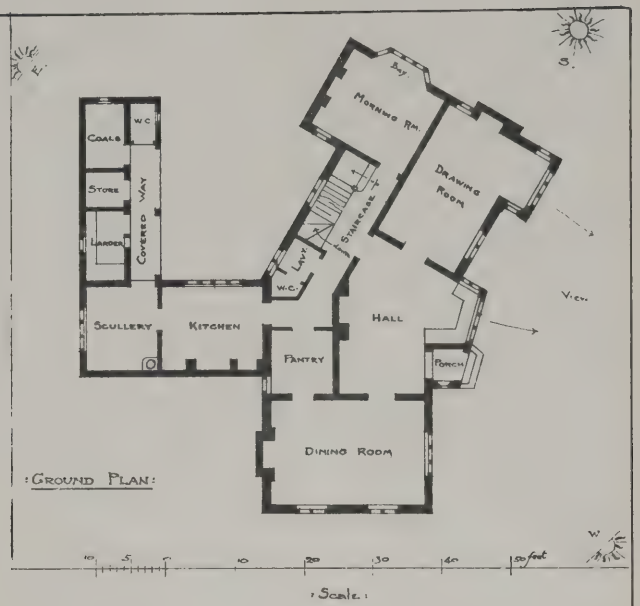
INK-PHOTO, SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

MONUMENT TO LORD PRESIDENT INGLIS.
ST. GILES' CATHEDRAL, EDINBURGH.
Dr. R. R. ANDERSON, Architect.



SHIREOAK - HEADINGLEY: for J. E. BEDFORD ESQ.

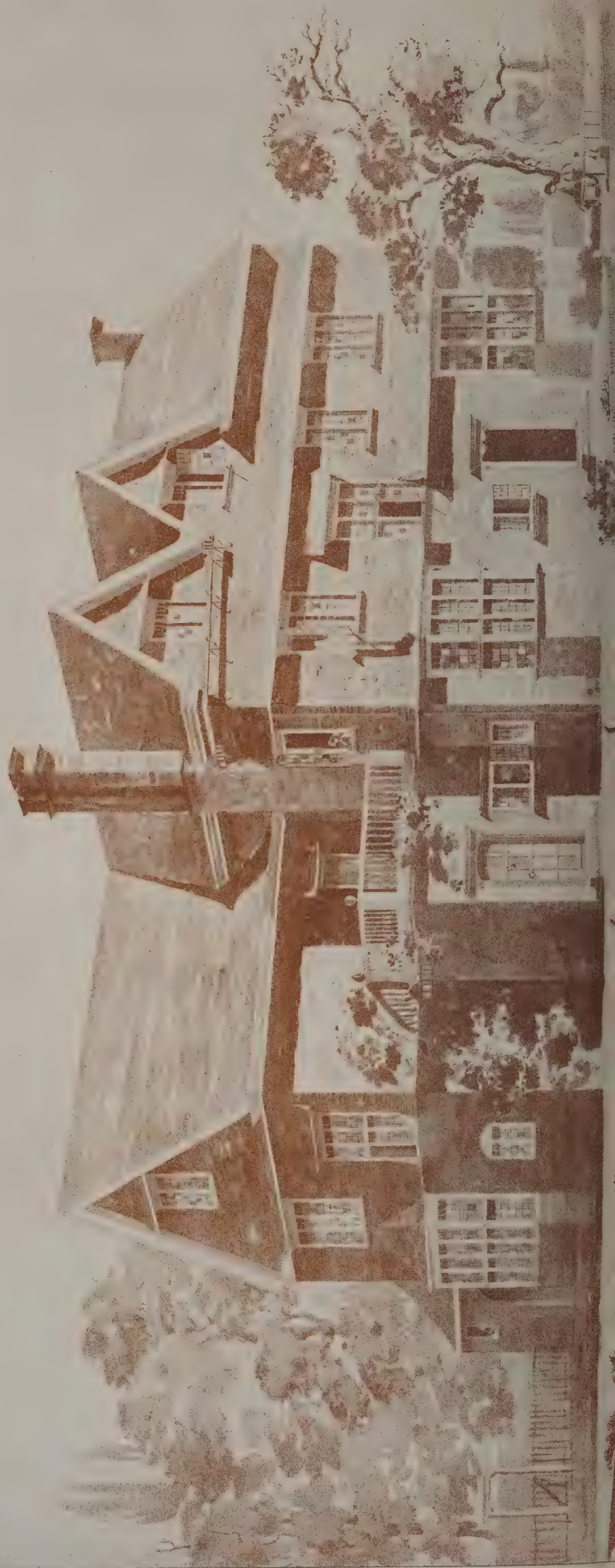
27th 1894.



Francis W. Bedford

The Architect, July 27th 1894.

- THE OLD GARDENS - HEADINGLEY -
- TWO HOUSES FOR JAMES BEDFORD ESQ. -



ILLUSTRATIONS.

MONUMENT TO LORD PRESIDENT INGLIS.—ST. GILES'S CATHEDRAL, EDINBURGH.

SHIREOAK, HEADINGLEY.

THIS house, for Mr. J. E. BEDFORD, is now named Arncliffe, and has recently been built at Headingley, near Leeds. It was planned at an angle so as to obtain the best view, as shown on the plan. It is built of specially made small red bricks and the roof is covered with Yorkshire stone slates of a most beautiful colour, in varying tones of grey, yellow, red and blue. The surroundings of the house have been carried out rather differently since this drawing was made. A higher terrace wall of pierced brickwork runs along the front with three steps up into the forecourt. A curved exedra-shaped wall with stone seat is built on the right instead of the straight one, with steps leading to the garden on a higher level. This garden is laid out in a formal manner with box-edging, and a garden house with curved lead roof terminating the wall before mentioned opens on to it. The hall is wainscotted to a height of 7 feet 6 inches, above which is a beautiful plaster frieze of wild rose modelled by Messrs. TARBURTON and TUGWELL, pupils of Mr. E. J. MAY, who have also worked some charming ornament of honeysuckle and thistle into the beams of the drawing-room ceiling. The dining-room has a beam ceiling which the architect intends painting with a sprinkling of flowers.

Messrs. THOMPSON & SONS built the brickwork, Mr. MAWSON made the woodwork; and Mr. STORY, Mr. BRANTON, Mr. HEPTONSTALL and Messrs. PICKLES BROS. were the plumber, plasterer, painter and slater respectively. The architect is Mr. F. W. BEDFORD, of Leeds.

THE OLD GARDENS, HEADINGLEY.

THESE houses are built on the site of the old Botanical Gardens at Headingley, near Leeds. The old bear-pit belonging to the Gardens still remains close by. In planning these houses it was endeavoured to get a decent hall to each house instead of the narrow passage generally found in houses of this size near Leeds. These halls are panelled to a height of about 7 feet 6 inches, and one has a little ingle-nook. They are built of specially-made small red bricks, and the upper walls are tile hung. Mr. CHAS. MYERS was the contractor for the bricklayer's work, Messrs. TOMLINSON & SON, joiner's, and Messrs. WATSON & WORSNOP, tiler's, all of Leeds. Mr. F. W. BEDFORD is the architect.

LAST week we gave an illustration of the upper hall of the Battersea Polytechnic. The whole of the fibrous plaster in the hall was modelled and supplied by Mr. Gilbert Searle, of 14A George Street, Camberwell.

THE STUDY OF ARCHÆOLOGY.

AT the luncheon which was given to the members of the Yorkshire Archæological Society in the De Grey Rooms, York, the Archbishop of York presided. In the course of his speech His Grace said:—

There were few things which interested him more than what he read of that and similar societies in other parts of the country. The work which they had chosen formed one of the most interesting by-paths of life. It embraced a very wide field, as one could see from a perusal of the list of publications issued year by year under the auspices of archæological societies. It ranged over enormous ground in point of area and over vast periods in point of time. He observed that among the many other matters of deep interest which formed the subject of those papers, one writer had found time and had thought it to be of sufficient interest to give an account of the long contest between the provinces of Canterbury and York with regard to their national precedence. That paper he should naturally read with very great interest. It had been said by Pope that "The proper study of mankind is man." That covered, he thought, the whole ground of their proceedings, for although they did not deal with man in his physical constitution or in his moral character, they did deal with him in his social development and in the progress of his civilisation. It was sometimes said that archæology was still in its infancy, and no doubt that was true. He presumed that in their case, as in most other similar cases in the world, the attainment of one object only opened out avenues of project for future objects to

be attained, and they would not soon come to an end even of the objects in the one county of Yorkshire which might profitably engage their attention. The history of archæology was not written in books but in stones, in unattractive mounds of earth and in rough and rugged implements of earlier ages, and in all those details which helped so greatly to give us an insight into the social condition of our forefathers in past centuries. The way in which archæology was now regarded was very different from that which was the case some fifty years ago. In those days an archæologist was regarded as a faddist, and when he was seen digging in some unprofitable-looking mound of earth, or excavating where nothing apparently was to be found, his proceedings were watched with a quiet smile very nearly approaching to contempt. That time had passed, and archæology was being estimated more and more at its true value. On the other hand archæology itself had made great advances. He thought they had escaped from the region of wild guesses which characterised some of the earlier inquiries of archæologists. There was an instance described by Sir Walter Scott in "The Antiquary," where the wonderful discovery made by that learned personage was overthrown by his humble follower with a very simple explanation. The days were past when a story like that had any appropriateness. Archæology had become a little more humble, a little more guarded in its conclusions, and therefore a great deal more accurate; and the accuracy of the conclusions of archæology was one of the most important features by which it ought to be characterised. While it was said that archæology was still in its infancy, he thought in their case the infant was vigorous, healthy and happy, and gave promise of prolonging a useful life. He was told that their prospects of success had very reasonable ground to rest upon. The balance at the bank was greater than had ever been the case before, and the number of members was larger than in any previous year. There seemed to be no lack of interest in the Society as shown by the increasing number of members, and there was no lack of objects with which to engage the attention of those who were brought to join the Society. As he went about the county he often came upon tracks of their work, and found interesting results of their inquiries. The pursuit which they had taken up was not, of course, remunerative in the ordinary sense of the word, but it produced what was far better than money. It produced objects of interest, the study of which could not fail to enlarge and elevate their thoughts as they occupied themselves with them, and it contributed to an increase of the knowledge which they possessed of times which, though long gone by, were never more interesting to succeeding generations than they were to those of the present day. The love of past days was growing upon us continually, and in that he thought they saw a sign of the stability of their national life, that they were not tossed to and fro with every whirlwind of revolutionary doctrine, but to apply words that were spoken in a higher and holier sense, they were glad to stand in the old ways and ask for the old paths. And to find out these traces of their ancestors, to study the works left behind them, and bring themselves into sympathy with their manner of life was surely one of the most interesting occupations which as a by-work and a pleasurable pursuit could possibly fill their minds.

MEDIÆVAL GUILD BOOKS.

A PAPER on "A Beverley Guild Book" was read by Mr. A. Leach at the meeting of the Yorkshire Archæological Association. The interest of the book, he said, largely depended on the fact that a similar one existed in York, and that they mutually illustrated each other. The interest of both lay in the light they threw on town life in the centuries before the Reformation, which, it must be remembered, effected a revolution among civil hardly less than among religious communities, and particularly on that remarkable development of community life in towns, the Corpus Christi play, the earliest extant product of the English drama, which found its highest perfection at York, and of which York had furnished at once the earliest and the most extant version. In one of the books exhibited by the Corporation in illustration of the history were enrolled the ordinances of craft or trade guilds, arbitrations in disputes, &c. The book belonging to Beverley was of the same kind, and began at the same date. He would not trouble them with any of the entries, merely remarking *en passant* that they showed a far greater regard to the public health on the part of the local authorities, and far more severe measures taken against offenders, than municipalities exercised in these days when they could only act under powers niggardly delegated by the central power. On the other hand, they showed a fussy interference with trade in the interest of monopolies. The most striking result of the contents of the book was that the two chief tests and manifestations of corporate life were the par-taking in the Corpus Christi play and the procession on "Cross Monday," otherwise, the Monday in Rogation week.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Continued from page 45.)

THE ancient paving tiles are quite consistent with their purpose, being merely ornamented with a pattern not produced by any apparent relief, but only by contrast of colour; and carpets should be treated in precisely the same manner. Turkey carpets, which are by far the handsomest now manufactured, have no shadow in their pattern, but merely an intricate combination of coloured intersections.



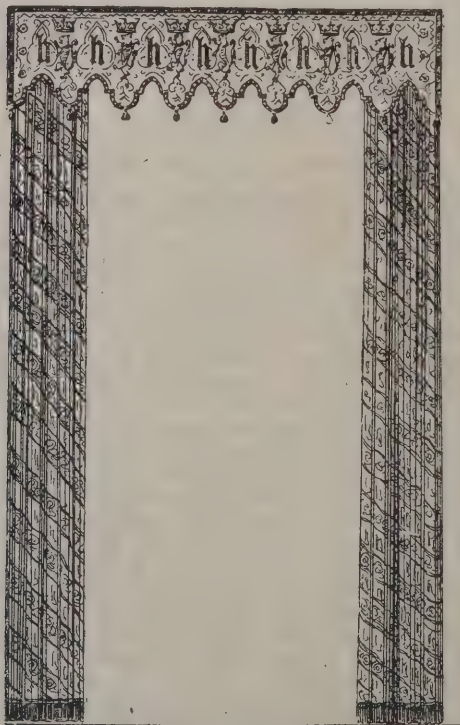
Pattern of Ancient Paving Tiles.

Modern upholstery, again, is made a surprising vehicle for bad and paltry taste, especially when anything very fine is attempted.

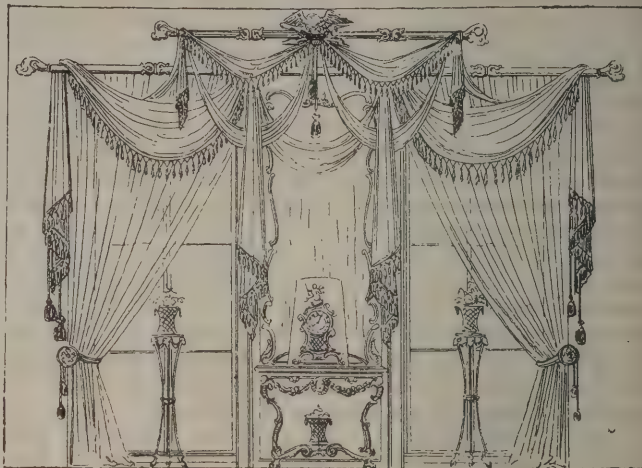
To arrange curtains consistently with true taste, their use and intention should always be considered: they are suspended across windows and other openings to exclude cold and wind, and as they are not always required to be drawn, they are hung to rings sliding on rods to be opened or closed at pleasure: as there must necessarily be a space between this rod and the ceiling through which wind will pass, a boxing of wood has been contrived in front of which a valance is suspended to exclude air.

Now the materials of these curtains may be rich or plain, they may be heavily or lightly fringed, they may be embroidered

ANCIENT CURTAIN HANGINGS.

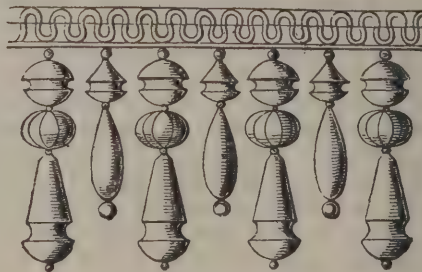


dried, is quite contrary to the use and intentions of curtains and abominable in taste; and the only object that these endless festoons and bunchy tassels can answer is to swell the bills and profits of the upholsterers, who are the inventors of these



MODERN UPHOLSTERY

extravagant and ugly draperies, which are not only useless in protecting the chamber from cold, but are the depositories of thick layers of dust, and in London not unfrequently become the strongholds of vermin.



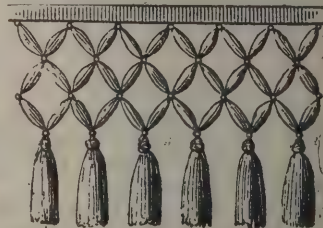
Modern Fringe, composed of turned pieces of wood.

originally nothing more than the ragged edge of the stuff tied into bunches to prevent it unravelling further. This suggested the idea of manufacturing fringe as an ornamental edging, but good taste requires that it should be both designed and applied consistently.

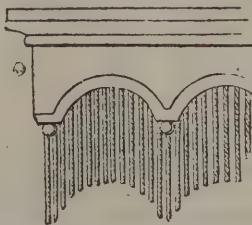
In the first place, fringe should never consist of heavy parts, but simply of threads tied into ornamental patterns.

Secondly, a deep fringe should not be suspended to a narrow valance.

Thirdly, no valance should be formed entirely of fringe, as fringe can only be applied as an ornamental edging to some kind of stuff.



Ancient Fringe, composed of threads.



A Modern Valance of Fringe.

Fourthly, fringe should not be sewed upon stuff but always on the edges. It is allowable at the very top, as it may be supposed to be the upper edge turned over.

But to return to metal-work. We have in the next place to consider the use of cast-iron. When viewed with reference to mechanical purposes it must be considered as a most valuable invention, but it can but rarely be applied to ornamental purposes.

Iron is so much stronger a material than stone that it requires of course a much smaller substance to attain equal strength; hence, to be consistent, the mullions of cast-iron tracery must be so reduced as to look painfully thin, devoid of shadow and out of all proportion to the openings in which they

with heraldic charges or not, according to the locality where they are to be hung, but their real use must be strictly maintained. Hence all the modern plans of suspending enormous folds of stuff over pots, as if for the purpose of sale or of being

are fixed. If to overcome these objections the castings are made of the same dimensions as stone, a great inconsistency with respect to the material is incurred; and what will be a much more powerful argument with most people, treble the cost of the usual material.

Moreover, all castings must be deficient of that play of light and shade consequent on bold relief and deep sinkings so essential to produce a good effect.

Cast-iron is likewise a source of continual repetition, subversive of the variety and imagination exhibited in Pointed design. A mould for casting is an expensive thing; once got, it must be worked out. Hence we see the same window in greenhouse, gatehouse, church and room; the same strawberry leaf, sometimes perpendicular, sometimes horizontal, sometimes suspended, sometimes on end; although by the principles of pure design these various positions require to be differently treated.



Cast-iron Mullion. Stone Mullion.

Cast-iron is a deception, it is seldom or never left as iron. It is disguised by paint, either as stone, wood, or marble. This is a mere trick, and the severity of Christian or Pointed architecture is utterly opposed to all deception; better is it to do a little substantially and consistently with truth than to produce a great but false show. Cheap deceptions of magnificence encourage persons to assume a semblance of decoration far beyond either their means or their station, and it is to this cause we may assign all that mockery of splendour which pervades even the dwellings of the lower classes of society. Glaring, showy and meretricious ornament was never so much in vogue as at present; it disgraces every branch of our art and manufactures, and the correction of it should be an earnest consideration with every person who desires to see the real principles of art restored.

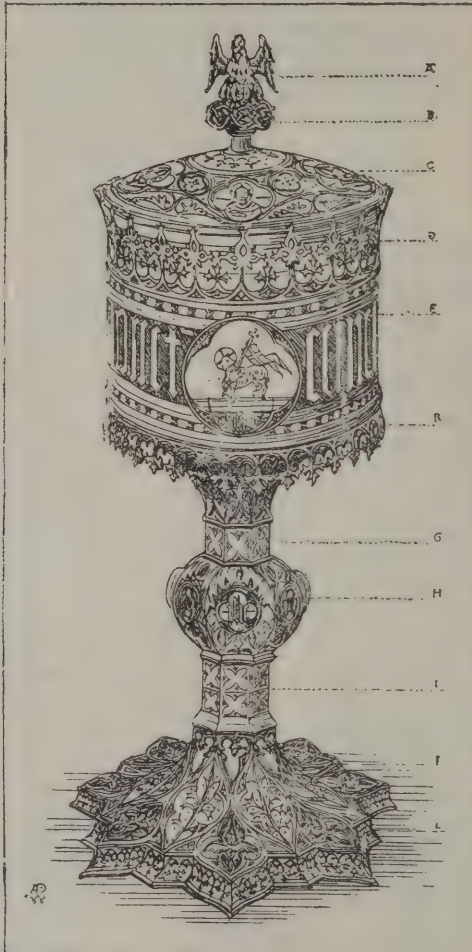
I will now briefly notice the exquisite productions of the ancient gold and silversmiths. As reformers and puritans have left us nothing but the mere name of the glorious shrine and ornaments which formerly enriched our cathedral and other churches, and as revolutionary and heretical violence has been almost equally destructive on the Continent, were it not for a few places which have preserved their ancient treasures, we should be unable to conceive half the art, half the talent, half the exquisite beauties of this class of ecclesiastical ornaments.



ALMERY IN A RELIQUARY CHAMBER.

In the sacristy of Aix-la-Chapelle is a treasury of inestimable value, consisting of shrines, reliquaries, crosses, crowns, ampuls, chalices, pyxes, books of the Holy Gospels, paxes and enamelled images of silver, all executed during the finest periods of Christian art, the richness of their material being only surpassed by that of their design. To enumerate even a tenth part of these wonderful productions of the goldsmith's art would occupy far too much time for my present purpose, but I will make a few remarks respecting them to illustrate the purpose of my lecture.

Their construction and execution is decidedly of a metallic character. The ornament is produced by piercing, chasing, engraving and enamel; many of the parts were first formed in thin plates of metal and then shaped by the pliers. Engraving is a style of ornament peculiar to metal. The old goldsmiths were undoubtedly the inventors of our present engraved plates for printing. They increased the effect of the ornamental engravings by hollowing out the ground in certain parts and filling it in with coloured enamels. The engraving of an ancient



pyx* will show the style of working silver, as practised during the Middle Ages. There are some exquisite examples of chalice feet enamelled with sacred subjects in the sacristy of Mayence Cathedral, and a circular reliquary at Aix, which Dr. Rock considers to have been used as a pax, which is a transcendent specimen of the art of enamel. The covers of the great books of the Holy Gospels were enriched with chasing, enamels and even jewels—the crucifixion of our Lord in the centre, and the emblems of the Evangelists at the corners of an elaborate border. Precious stones of every description were studded on these ornaments, which presented a wonderful combination of richness and beauty, produced by gold enamel of various hues and sparkling gems, arranged with the purest design and most harmonious effect. As it would occupy a whole work to illustrate these objects separately, I have endeavoured to convey some idea of their beauty by the annexed engraving of a reliquary chamber (see preceding page).†

* References to figure of pyx.—A. The pelican, chased. B. The nest, composed of twisted silver wire. C. Engraved and enamelled. D. Pierced and engraved. E. Engraved and the centre enamelled. F. Pierced and engraved. G. Quatrefoils enamelled. H. Knop beat up with enamelled quatrefoils. I. Quatrefoils enamelled. K. Foot hammered up, then engraved and enamelled. L. Engraved.

† References to almetry.—I. Feretrum or portable shrine. II, II. Books of the Holy Gospels. III. Relics in a silver bust. IV. Reliquaries. V. Relic of the holy cross. VI. Pax for the kiss of peace during the mass. VII. Morse for fastening a cope. VIII. Head of a processional cross. IX. Precious mitres. X. Pastoral staff. XI. Cantor's staff. XII. Images of silver gilt.

These treasures, which Aix now alone possesses, were by no means superior to many of those splendid ecclesiastical ornaments formerly to be found in all the large churches of this land, but which fell a prey to the rapacious tyrant Henry and his abettors in the general wreck of faith and art at the period of his lamentable scism.

Silversmiths are no longer artists; they manufacture fiddle-headed spoons, punchy racing cups, cumbersome tureens and wine-coolers; their vulgar salvers are covered with sprawling rococo, edged with a confused pattern of such universal use that it may be called with propriety the Sheffield eternal. Cruet-stand, teapot, candlestick, butter-boat, tray, waiter, teacup are all bordered with this in and out shell-and-leaf pattern, which, being struck in a die, does not even possess the merit of relief. Like everything else, silver-work has sunk to a mere trade, and art is rigidly excluded from its arrangements.

Iron-smiths were artists formerly, and great artists too; Quentin Matsys, for instance, whose beautiful well-top stands in front of Antwerp Cathedral, and whose splendid picture of the entombment of our Lord is the greatest ornament of the Musée of that city. Quentin Matsys are not, however, of our generation; if you want some objects executed in iron rather different from what are in ordinary use, and go to a smith to whom you explain your wishes and intentions, the vacant stare of the miserable mechanic soon convinces you that the turning up of a horse-shoe is the extent of his knowledge in the mysteries of the smithy. You then address yourself to another, and one who is called a capital hand, and if he be sufficiently sober to comprehend your meaning, he will tell you that what you want is quite out of his line, that he only makes a particular sort of lock, and that he does not think there is a man in the trade who could undertake the job, which, after all, is perhaps a mere copy of a very ordinary piece of old ironwork, and this is a true picture of the majority of our artisans in the nineteenth century, the enlightened age of mechanics' institutes and scientific societies.

Mechanics' institutes are a mere device of the day; the Church is the true mechanics' institute, the oldest and the best. She was the great and never-failing school in which all the great artists of the days of faith were formed. Under her guidance they directed the most wonderful efforts of her skill to the glory of God, and let our fervent prayer ever be that the Church may again, as in days of old, cultivate the talents of her children to the advancement of religion and the welfare of their own souls, for without such results talents are vain, and the greatest efforts of art sink to the level of an abomination.

(To be continued.)

ART IN THE FLOOR-PLAN OF A BUILDING.

THERE seem to be two mistaken tendencies in our American methods of architectural education; on the one hand, to teach architects in a scientific or literary way; on the other hand, to teach with an absolute disregard for the proper and legitimate methods of work and study in our art, as if these methods were inartistic. Our methods of study should be as peculiar to us as those of the sculptor, painter and musician are to them.

The one class of men with whom we have to contend includes those who would dispense with the triangle, compass and T-square, and with such familiarity with the orders and with the principles of composition as will enable the student to use them with the utmost facility. They neglect these things, forsooth, to make room for what they call clever sketching. These men seem to have a peculiar disdain for the legitimate means of study, as though they were inartistic. The other class of men, the pretended *savants*, would learn their profession as though a good knowledge of the history and literature of their art, with a course of general lectures, were all-sufficient if followed by a few years of practical office experience. To the so-called *savants*, or the men who would teach architecture only in scientific or literary ways, it should be said that architecture is an art rather than a science, and that when the architect is most skilled in his art, then he has least need of recourse to science. Of course an architect must be familiar with descriptive mathematics for the purpose of calculating the intersection of vaults, roofs and various problems in stereotomy. Yet, if the floor-plan has been well studied from an artistic or æsthetic point of view, there will rarely be left other difficult engineering and mathematical problems for the architect to solve. Here is the key to the entire problem.

I shall first endeavour to make clear the fact that there is such a thing as art in the floor-plan. There seem to be few architects in America who realise that the floor-plan is anything more than a mere matter of the convenient arrangement of the several parts of the building. A good floor-plan, as seen

* Paper by Mr. Thomas Hastings, published in the *Engineering Magazine*, New York.

on paper and before examining into the questions of arrangement, has proportion, form, scale, colour, values and character. The drawing of the plan will awaken as much enthusiasm in the educated architect as does the picture in the painter, or the statue in the sculptor. This plan should be thoroughly studied and practically finished before the architect has more than a vague idea of the design of the exterior of the building. The plan involves and determines the entire composition; the silhouette or outline of the whole structure is really projected on the plane of this drawing—*i.e.* the thickest walls and the heaviest piers are the portions of the outline of the building which go the highest, for the silhouette is the necessary outcome of the artistic relations of these different wall and pier thicknesses to each other. We know that when a pier is 5 feet square in plan, whether it is the foundation of a tower or the foundation of one of the corners of a dome, it must go higher than the wall next to it, which is only 2 feet thick. The relations of the wall to the pier must look well on paper. If the proportions and the relations of the walls to each other are good, the silhouette will prove to be good when seen in perspective after the building is complete.

The floor-plan determines the entire composition, and it does away with the perspective drawing as a help to architectural study, and leaves it no place except to explain a building to a layman. It is amateur-like to use the perspective for any other purpose. When the plan is well studied, then it constructs well and builds well, and we need very little of the analytical mathematics to assist us in our construction.

Until modern times, how much mathematics (besides geometry and the descriptives) did architects know, as compared with what we are given to learn, and what did they know of the strength of materials? With them it was mostly a question of good judgment, with a proper and uncommon understanding of constructive principles, and of stereotomy and the other descriptive mathematics. Analytical mathematics is comparatively a modern science. While, for example, there existed graphical rules for the approximate determination of the thrusts from arches as early as the thirteenth century, yet it is practically only within the past fifty years that the correct principles of analysis have been fully developed, and there is still room for improvement in this direction. Until recently architects probably never calculated the strength of their materials, or the thrust of arches and vaults. With them it was a question of intelligence and not of ingenuity. It was the qualitative rather than the quantitative principles of construction that they studied, and these always based upon experiment or experience. It was by knowing how to avoid difficult problems with art in the floor-plan that they escaped having difficult analytical problems to solve. We must always give precedence to practice and truth before laws and theories.

To illustrate this principle, there may be many arches indicated in a well-studied plan; but the thrust of each is received, either by an equivalent thrust in the opposite direction or by a solid masonry wall, in line with the direction of the force, to buttress the arch.

In a well-studied floor-plan there will always be artistic reasons for making a pier economical in size and strong enough to support the weight that it has to carry. By pure mathematics we can only approximately determine what should be the size of a pier. The strength of materials must be estimated. We select at random several specimens of the stone to be used in our building. We obtain crucial tests from a machine designed for this purpose, and so we are supposed to learn from these few specimens the average weight per cubic inch which the stone will support. This we call our co-efficient of strength in the stone chosen for our building. Taking into the account the fact that the quarry where the stone is obtained may have a great fissure running through it, or may have other imperfections, the mathematician enters upon his calculations to learn how large a pier built of this stone should be to support the weight that is to be above it. After this the architect practically admits the inexactitude of his premises by increasing two or more times the size of the pier and calls this the factor of safety or ignorance. I believe in such calculations for purposes of verification, but in general the piers will be about as safe to build upon when studied by an educated architect as when calculated by engineers.

It is really architecture and well-proportioned masonry *versus* engineering and the iron girders. Each has its use, but they are not interchangeable. Buildings have stood for centuries, and this is solely because their plans, as seen on paper, were so well studied, so thoroughly artistic and beautiful, that constructive difficulties were avoided.

Now that photographs and illustrated books are becoming so accessible to the student, adaptation is a greater temptation to us than ever before. We compile more than we compose, but if our floor-plan is first thoroughly studied in an artistic way to meet the practical requirements of the problem in hand, then, when interpreting this plan and designing the façade, we can neither copy nor adapt what was conceived for one thing, making it serve the purpose of another.

We must not disparage analytical mathematics for purposes of verification. So long as a great many inartistic buildings are put up, such verification is needed for the protection of human life. From innumerable buildings time makes its selection, but at the sacrifice of human life in those which fall, because the inartistic buildings were not subjected to analytical verification. But this kind of verification, especially in complicated and exceptional cases, should always be entrusted to experts or specialists. Of course there are exceptional and most unfortunate conditions imposed upon us in these days, under which conditions the plan has but a very small part to play in the solution of the problem, such as 15-storey office buildings on 20-foot lots. Here all would agree that expert mathematicians and engineers should be called into consultation, just as they are called in for questions of steam-heating, ventilation or electrical work. But with these exceptions in the well-studied floor-plan, the constructive problems solve themselves, so that we do not have to resort either to calculation or to mere ingenuity. The plan determines every perpendicular line, so that it is, in fact, almost impossible to build a structure that is absolutely unsightly on a well-studied, well-proportioned plan. The thicknesses of walls and piers should be proportionately related to the spans of the arches or to the distances and floor-spaces. The thickness of a column should be proportioned to the intercolumniation or distance between columns, and the whole should be looked upon almost as you would look at a drawing in black and white, the black portions of the plan indicating the walls and piers, the largest going the highest in the elevation. Therefore, the more art we have the less science we need. When a floor plan has been thoroughly studied, then in developing the exterior or interior no changes will be needed even in details. We shall be saved from adaptation instead of composition. In the further development of the scheme we need only fill our minds and hearts, however large, with the spirit, the ideas and the sentiments of our age, and study and interpret the plan in order to reach the best results. Thus art in the plan is the first great need.

In the schools where architecture is taught in the United States the lecture-room plays too important a part. The architect or professor who teaches does not come enough into personal contact with the student to criticise his work, and the advanced students are not enough in contact with the beginners, as is universally customary in the ateliers or the studios of Europe.

To the men who disdain these true methods of study because they think them inartistic I would say that we do too much mere sketching and not enough serious studying. The architect should not despise the T-square and the triangle any more than the musician should despise the key-board of his piano. Sketching plays a very minor part in architecture; yet how many architects feel, if they can make a clever sketch, that they are skilled in their profession. An architect's drawings should be looked upon only as architectural—merely as means to an end—and yet they need be none the less artistic and fascinating to the architect.

The architect should design in plan and not in perspective. The day is coming when the public and all honest critics will demand of design in architecture something more than mere taste and refinement of details; when the monument must be something more than a conglomerate of well-moulded garlands, wreaths and ribbons, well-proportioned windows and columns, or the use of materials fine in texture and colour; and this can only be when the plan is looked upon as something more than merely a question of convenient arrangement, and the picturesque as something more than an eccentric accumulation of accidentals and good details.

I would not be misunderstood. I would not disparage the thorough study of the plan from a utilitarian point of view. This is in fact the principal channel through which our life and habits influence our composition and style. Before beginning to study the general composition of the floor-plan, it is first necessary to reduce the problem to its simplest form from a utilitarian point of view, taking into account the number of the principal rooms or divisions and the use that they are to be put to, their sizes and the most reasonable forms that should be given to them. This is, as it were, the theorem or the programme of the composition.

If the question of disposition is not thus thoroughly understood at first it will arrest the freedom of the mind and the imagination.

Of equal importance is the question of the position or site of the building and the principal points from which it will be seen. Certain distributions of the several parts of the building that would be well for a low and flat country would be inappropriate for a hill. The streets, promenades or squares, or possibly water—river, lake or sea—should of necessity have a great influence upon this distribution. The architect should know how to dispose his masses and should calculate the different effects with these conditions of environment taken into the account; that is to say, the principal room may demand a certain outlook, and perhaps some other rooms must be seen

from a given point of view. The plan which does not satisfy all such given conditions is not only impracticable, but must in consequence thereof be absolutely inartistic, for a good building must have obvious adaptations both to its uses and to its environment. These things must of necessity influence the general character of the design.

In general it may be said that there are three kinds of floor-plans—the regular, the irregular and the picturesque. A monumental floor-plan is always regular, unless the peculiarities of the site make this impossible. The regularity consists in the plans having one principal axis. The irregular plan is an adaptation to the imperatives of an irregular site. It secures as much symmetry in the arrangement of its parts and proportions as the limitations of the site permit. The picturesque plan is not merely eccentric or lawless, but is an attempt to conform to the picturesque conditions of the environment, at the same time preserving as much of balance and symmetry in the details as such adaptation will allow.

The general form may be as irregular or unbalanced as the letter L, and yet have perfect symmetry and circulation such as will give interesting vistas in every direction. The general principles of composition are the same as in the case of a regular plan.

Having considered the plans of buildings, we come now to speak briefly of the plans of the immediate surroundings, which the French call the *plan générale*. They have a very characteristic name for this portion of the composition, which is the "saucé of the architecture." It is this portion of the design which unites or marries the building with its natural surroundings or the landscape. Most of the same principles of composition obtain in the planning of this portion of the work as in the planning of the building itself. The silhouette must make first of all an agreeable *ensemble* with the silhouette of the building. If the surroundings will allow it the building should be so placed as to have the greater portion of the grounds on one side of it. This is generally very desirable, and especially when the site is small in proportion to the size of the building. The object is to give a large and open space on this one side, instead of a small frame or fringe all the way around it. This is not only true in the case of a public building, but it is just as true in the case of a dwelling. It would seem as though this were a mere question of common sense, and yet how little the principle is recognised, how dreary are the suburban homes of the poorer classes in this country. It is mainly because a man, when he builds, places his small square house in the centre of a square lot, with a square walk around the house and a fence that forms a square around the walk; and, as though this were not enough, even the streets all form squares outside his lot.

While the landscape or surroundings should govern the general composition of the building in the beginning, the building should in turn, when completed, influence and govern the arrangement and composition of that portion of the landscape work which comes in immediate contact with it. This landscape work is to surround and to support the building, serving both as frame and as pedestal. The accessories of the architecture, such as the terraces, balustrades, paths, fountains, open spaces and vistas which come nearest to the building, and other architectural features, are really a part of the building.

While the plan of the surroundings does not need to repeat the form of the building itself, it should everywhere recall its principal axes and lines, and it should accentuate its general silhouette, just as where there is a pavilion or important feature in the building there should be a circulation in the surroundings leading up to it.

Fountains, balustrades, statues and rows of trees, when desired, should be clearly indicated in plan. All these things, with the plan of the building itself, should hold together in one great *ensemble*, while there may be interesting detail in the form of niches in the verdure for statues or recesses for seats or vases, and small round or square breaks taken off the angles where two paths meet. All these forms should be studied in almost exactly the same way as if they were in the plan of the building itself. A statue should rarely be placed in the middle of a lawn, but either in a recess or in the centre of a square at the intersection of an axis with the circulations. The size of the statue, as represented by its pedestal, has a proper relation to the other surroundings and to the plan of the building. A statue generally looks better in a public square with an architectural background or in a formal garden in a recess on either side of a main avenue, with thick foliage behind it, instead of standing against an open sky. Generally speaking, therefore, it is best to keep statues out of the large parks which are more apt to be naturalistic and put them in the small parks.

Something should be said with reference to the general plan of cities, that is, the laying out of streets, avenues or parks.

The planning of a city is rather an evolution in history than the work of an architect, and so gives valuable testimony to the different phases of the life of the people. Many of the most interesting souvenirs of the past are seen not only in the build-

ings and monuments, but also in the general disposition of the streets and public squares. How much art, however, may be displayed in the influencing of this evolution can be seen by looking briefly at some of the cities of modern times. The greater portion of every city is the result of the accumulated works of generation after generation. This development is determined by local circumstances, by the political constitution and by the commercial and domestic life of the inhabitants.

But happy is the city whose development in the cutting of new avenues and the building of new squares and parks has been governed by the laws of art. In a general way, the cities which have most impressed us are those that have at least one great artery running through the interesting confusion and natural complication of its streets. For example, how much more lasting is our impression of Paris than of London. When we think of Paris, we first see that one main artery with which we associate the great composition spread out before us when standing on the Place de la Concorde. On one side are the garden of the Tuileries and the court of the palace of the Louvre. In front of us is the magnificent avenue of the Champs Elysées, which terminates with one of the greatest triumphal arches ever built. To the south is the river Seine and the beautiful bridge leading to the monumental portico of the palace of the Corps Législatif. To the north, those two most splendid buildings of simple and vigorous proportions the Garde Meuble, and between these the vista of that wide avenue leading to the façade of the Madeleine. In the centre of the Place de la Concorde is an Egyptian obelisk; in the axis of the main circulation there is a large fountain on either side and in axis with small circulations from the corners of the square; in different parts of the composition are colossal statues and a multitude of candelabra. All these things enter into the composition of what I would call the main artery of the heart of the city—one of the greatest plans that the world has ever seen. All this is in striking and interesting contrast with the rest of the city, which is so complicated that it seems utterly devoid of any plan and to be the result of mere accident. And yet all this confusing complication is the outcome of most serious consideration in the history of the city.

What impressions to compare with this have we of London, where almost all seems to be confusion, and what is our impression of New York as to its general scheme, where there is no interest either of contrast or of confusion? Rather the greater part of the city is laid out in monotonous squares like a checker-board, without any street or avenue leading up to any monument or other object of interest and with the circulation in only two directions. It does seem that every modern city might have one great artery or central avenue, and as though it might be possible to avoid prolonging streets to an indefinite length without leading up to anything.

The New York Municipal Government has now in hand a most interesting opportunity to display artistic skill and to illustrate some of these principles by the selection of a site for the new city hall. Instead of crowding a small park or open space with a large building which would be entirely out of scale with its approach or surroundings, they should select a site in an inexpensive neighbourhood, which should be near enough to Broadway to allow of the widening of a cross-street to lead up to the centre of the building, as was done in the case of the Rue Soufflot in Paris, which leads up to the Panthéon, thus making the widened cross-street a short avenue of approach to the central motive of the building. This building would soon change and determine the character of its surroundings and so increase the value of adjoining property.

Thus it may be seen that the same principles which apply to the most unimportant plan apply also to the monumental building, and to the general plan of its surrounding as well as to the cutting of streets and the laying out of a city.

INSIGNIA AND PLATE IN YORK.

A PAPER on the "Insignia of the City of York" was read by Mr. W. H. St. John Hope at a conversazione held during the meeting of the Yorkshire Archaeological Society. He said that the insignia of the city of York, if unable to compare in quantity with those of Bristol or Hull and some few other places, certainly yielded to none in their extreme historical interest and artistic value. They consisted of two swords, a cup of maintenance, a great mace and four sergeants' maces, gold chains for the lord mayor and the lady mayoress, a lady mayoress's staff, a chain and badge for the sheriff, three ancient livery collars and badges, a porter's staff and a most interesting group of seals. The city was also in possession of a very fine collection of plate, including a gold loving cup, another silver gilt, a basin and ewer, two of the curious punch bowls called monteiths, three tankards, a pair of posset pots, a silver chamber-pot and various articles of table use chiefly modern. The special privilege which was shared by some five-and-twenty other cities and towns of having a sword

carried before the mayor was conferred upon the city of York in 1396 by Richard II., who granted and confirmed to the citizens and their successors for ever "that the mayor of the said city and his successors for the time being may have carried or may cause to be carried before them their sword which we gave them, or any other sword they please, out of the presence of us and our heirs with the point erect, both in the presence of other magnates and lords of our kingdom of England." According to Drake "the sword was given by the king on his visit to York in 1388, when King Richard took his sword from his side and gave it to be worn before William de Selby as first Lord Mayor of York." Drake described four swords as belonging to the lord mayor during his office. The first of the swords and the largest was the gift of the Emperor Sigismund; another given by King Richard II., from which the title of lord accrued to the chief magistrate of York. This was the least sword among them, but the greatest in value for the reason stated. A third was that of Sir Martin Bowes, Lord Mayor of London, which was the most beautiful. The fourth was formerly made use of every time the lord mayor went abroad. The sword given to the city by Richard II., and which one would have regarded as one of the city's most cherished possessions, had now disappeared, no one seemed to know when or whither. It was in existence certainly down to 1796. Of the remaining swords, the oldest and largest was an exceedingly fine example of the early part of the fifteenth century. This sword was of exceptional interest as being the one hung up, according to custom, over the stall of the Emperor Sigismund in St. George's Chapel, Windsor, on his election as a Knight of the Garter in 1416. After the emperor's death in 1437 it became the perquisite of the dean and canons of Windsor. According to a contemporary record in the city archives it was given by the dean of Windsor to one of the canons, who was also a canon of Howden and rector of Middleton, near Pickering, and a native of York itself, and by him presented to the city in 1439, to be carried before every successive mayor. For how long before the granting of the charter of 1396 a mace or maces were borne before the mayor and sheriffs of York was uncertain. The lady mayoress's gold chain of office was given by Marmaduke Ramsden, of London, in 1670. The common seal of the city of York was a fine double one of silver, of thirteenth-century date, and was still in use. The mayor's seal was of late fourteenth-century date. The silver seal of the "statute merchant" was likewise in the possession of the city. The "king's seal" was of the usual type, with the king's bust with the lion of England in base between two castles. The seal had, however, this peculiarity, that the under castle was movable, probably to enable other devices to be substituted for it, though none such now existed.

A paper on the "Corporation Plate," by Mr. T. M. Fallow, F.S.A., was also read. He said that the city of York was fortunate in possessing so fine and interesting a collection of plate. From an examination of the city records, it would seem that prior to the year 1558 the city did not possess any plate proper; but in that year Sir Martin Bowes presented to the Corporation a silver basin and ewer, parcel gilt, which formed the nucleus of the subsequent collection. Other valuable pieces of plate were acquired by gift and bequest during succeeding years, but at a meeting of the Council held on February 7, 1643-44, it was resolved that the city, being 500*l.* in debt, two of the aldermen should view the city's plate and certify to the next court what they thought fitting to be sold and what it would fetch. In the next minute of the Council, bearing date February 16, the order for the sale of certain pieces was recorded, and in that way the city got rid of the basin and ewer given by Sir Martin Bowes; also those given by Mr. Thomas Metcalf, of London, as well as of some eighteen other vessels. Drake, in "Eboracum," gave a list of the plate existing in 1681, some seventy pieces in number. Of these, eight still remained, and twenty-six others in some other form, the result of exchange or refashioning. Mr. Fallow proceeded to describe some of the pieces, including the Turner standing cup, the rose-water basin and ewer, tankards, monteiths, posset-cups, waiters, the centre-piece, consisting of a domed temple with the statue of Justice within, &c. The most valuable, and one of the most interesting, of the pieces of plate was, he said, the loving-cup of solid gold. It was an ordinary shaped goblet with a baluster stem, being 9½ inches in height and weighing 26 ozs. 13 dwt. The inscription was as follows:—"The gift of Marmaduke Rawdon sonn of Laurence Rawdon late alderman of this city, Ano. 1672." It bore three hall-marks, one of which was a capital italic "P," the old York letter for 1672-73. Gold plate—that was, plate made of solid gold—was exceedingly rare at the present day, and he knew of only one other gold cup in Yorkshire. The loving-cup of the York Corporation was unique, so far as he knew, in being the only instance of a piece of gold plate bearing provincial hall-marks, and the city of York might well be proud of possessing it. Mr. Hope told him that among collections of plate belonging to the corporations of England, there were, so far as he knew, only two pieces of gold plate.

DRURY LANE THEATRE.

A GENERAL assembly of the Theatre Royal Drury Lane Company of Proprietors was held at the saloon of the theatre on the 18th inst. The report of the committee showed that the gross receipts, including balance from last year of 1,103*l.*, had been 8,500*l.* The payments had been 6,238*l.*, leaving a balance of 1,262*l.*, while a further sum of 1,000*l.* had been laid out in the purchase of 1,002*l.* 2½ per cent. Consols, in addition to 3,000*l.* laid out the previous year. The company had agreed with the lessee for the sale to him of the residue of their term, together with the patent and chattels, for the sum of 5,000*l.* The Duke of Bedford had agreed to release the company from all claims to dilapidations. The Chairman, in moving the adoption of the report, said that the sub-committee had done everything in its power to obtain a renewal of the lease. At that time last year a letter was received from the Bedford office refusing a renewal, and consequently a resolution was passed requesting the Duke of Bedford to reconsider his decision. The Duke had refused to do so, and, in response to an application for a short lease, said that as he was only the tenant for life it would be impossible for him to grant one except at a rack rent. The committee had agreed to sell to Sir Augustus Harris the lease for the remainder of their term. The motion was seconded by Mr. Edward Chitty, who complained that, although the proprietors had spent over 300,000*l.*, of which they had not had a penny return, their property had been practically, though no doubt legally, confiscated, and they were not even granted a short lease in order that they might recover something. The report was adopted.

CAISTER CHURCH RESTORATION.

A PARTY of ladies and gentlemen, the *Norwich Mercury* says, mostly Yarmouth members of the Norfolk and Norwich Archaeological Society, paid a visit to Caister, and were received by the Rev. E. G. and Mrs. Murrell. The party consisted of the Rev. H. W. Harden, vicar of Hemsby; Rev. C. Whitehead, chaplain of Yarmouth Workhouse; Dr. and Mrs. Adcock, Mrs. Harvey George, Mr. and Mrs. Robert Hewett, Mr. T. Blyth, master of Yarmouth Workhouse; Mr. and Miss McDonnell, Mr. C. Stuart, vicar's warden, and Mr. J. E. Teasdel. The latter, with the rector, first proceeded to the chancel, where a number of specimens of early workmanship were on view, not the least noticeable being the remains of a fine arch, taken out in pieces from the old walls and put together, evidently a portion of the window of the old church. In the south aisle the remains of what was once a small chapel were inspected. In the piscina was an old oak shelf, which Mr. Harden said must have been put there in the fourteenth century, protected by coating of lath and plaster; on being taken out it crumbled away. Two skeletons were found here, Mr. Teasdel said, and from the absence of any sign of a coffin or inscription he thought it not impossible that they were two smugglers who had been buried secretly there hundreds of years ago by their friends. At this point Mr. Teasdel read the following paper on "The Early History of Caister and Church":—

Caister was formerly divided into two parishes, Holy Trinity and St. Edmund's, and they were consolidated on September 22, 1608. The church dedicated to St. Edmund has been suffered to fall into decay, but it can be used as a chapel of ease if needed; but this has rarely been the case of late years. The chancel of the present church was restored in 1852 and the porch was added some time ago, with certain alterations by the present rector. Unfortunately, when the nave was re-roofed, it was not put into its original pitch, as shown by the existing marks on the tower. This was done in 1781. The chancel has a sedilia for three priests and a piscina, also monuments of the Crane and Blennerhessett families. The Mr. Crane here mentioned was the reputed owner of the Star Hotel at Yarmouth, which he built about 1594. There does not appear to be any authentic history of this church. It appears to have been re-erected at some time or other from the ruins of some former church probably now covered by the sea. It is very plain that many alterations have been made to the windows, both in size and position, from time to time, and one in the south aisle has been blocked up. From the appearance of the walls it is evident that the lath and plaster so shamefully put on was put there to cover up certain defects, and the amount of rubbish found used for filling-up purposes is astonishing, most of which is evidently part of some church fabric of early days. With regard to the tower a romance is attached to it which tells of a sailor's bride being buried there. If, however, such a thing did take place, there is no trace of it there now. The lead round the parapet was removed, no doubt by the Puritans, and the elevated roof seen from the road is a small one raised to keep the wet out of the interior of the tower. There is nothing whatever there in the way of a coffin in these days, and he really questioned the whole story, which, no doubt, be-

longed to the folk-lore of the district. The probable date of the building is the fourteenth century, and it is said to have been built by the father of Sir John Falstaff, who lived in 1386 at Yarmouth.

After examining a small Saxon window and parts of the church, a move was made to the churchyard, where the exterior of the tower was examined, and to all appearances the two buttresses rest on two large tombstones, which form a very solid base. The tomb of Sarah Martin, the celebrated prison visitor, was pointed out by the rector. By the kindness of the rector the entire party were entertained at tea at the rectory. After tea some of the party ascended the old tower, the feat being not very easy to perform. Sundry owls were disturbed *en route*, but at last the parapet was reached, an examination of which shows no traces whatever of anything ever having been on it, as alleged. The state of the parapet is very bad, and something will have to be done to secure it, several parts being quite loose and liable to fall during a heavy gale. The company thanked the rector and Mr. Teasdel for their kindness.

IRISH ARROWHEADS.

A PAPER on instruments from the raised beach of Larne and Irish arrowheads was read by the Rev. George Buick at the meeting of the Royal Society of Antiquaries of Ireland in Carnarvon.

In a collection, he said, of Irish antiquities, the department which usually attracts most attention is that containing the arrowheads. This in itself is not to be wondered at. The variety in the forms displayed, the graceful outlines, the differing shades of colour, the marvellous differences in detail despite the general similarity which obtains, and the workmanship, bold and free or delicate and constrained, as the case may be, appeal alike to the eye and imagination of the visitor. Yet, strange to say, no detailed description of these beautiful and interesting objects, save the somewhat imperfect and exceedingly brief one given by Sir William Wilde in the Catalogue of the Royal Irish Academy's Museum, has hitherto been attempted. Ireland is the country *par excellence* of arrowheads. A rough estimate of the number in the public and private collections throughout Ireland shows that they amount to something like 10,000. At least as many more must have been taken out of the country, and when we add to all this the further fact that almost every day numbers are still being turned up from the soil we get a vivid idea of their phenomenal abundance. The majority of these are made of flint. Of arrowheads other than flint there are comparatively few. So far as can be made out the proportion is about one in a hundred. The bulk of these are of pitch stone or basalt. A few are of Lydian stone, and a very few of chert. Those composed of the latter material are chiefly from the sandhills near Bundoran. In size arrowheads range from about 4 inches in length to 1 inch. A medium size is from 1½ inches in length to 2 inches. The workmanship of the arrowheads is something wonderful, considering the nature of the material out of which they are made. The makers of them must have been born artists, with deft fingers and a keen eye for beauty of form. They divide readily into three great classes—the leaf-shaped, the triangular and the stemmed. Each of these has two sub-classes, and these again a number of varieties. This is the best classification to adopt, not only because of its simplicity, but also because it seems most in line with the process of development out of which the typical forms have grown. The sub-classes of the leaf-shaped arrowheads are the leaf-shaped proper and the leaf-shaped modified, viz. the lozenge-shaped and the kite-shaped, produced by altering slightly the edges of the leaf-shaped head. Those of the triangular class are—first, the ones which have a straight base; and second, those which have the base notched or indented. Of this latter sub-class there are some four varieties. The two sub-classes of the stemmed arrowheads are—first, those without barbs; and second, those with barbs. Here sometimes the stem and barbs are of the same length; sometimes the stem is longer than the barbs; and yet again, there is a variety in which the barbs are longer than the stem. Many belonging to all these three great classes are serrated. Of the serration itself there are two kinds—the one the necessary result of the chipping, the other intentionally produced and altogether independent of, and apart from, the original flaking. Two examples only of arrowheads still attached to their shafts have been met with in Ireland. In both instances there was a lapping of gut or sinew immediately below the head itself. Arrowheads are to this day regarded by many of the peasantry as the missiles of elves and fairies. They are also used to cure cattle which are supposed to be bewitched. Instances were given of this and the paper closed with a reference to the remarkable fact that there is no mention of bows or arrows in old Irish writings, though Spenser and other authors of his age speak of them as part of the equipment of a soldier in the sixteenth century.

GENERAL.

Sir Wm. Henderson has presented to the Aberdeen Art Gallery a picture by John Philip, R.A., *A Highland Lassie*, and Mr. Catto a painting of *Morning on the Roman Campagna*, by M. Tiratilli.

Mr. A. E. Collins, of Reading, has been appointed city engineer, architect and surveyor for Norwich, at a salary of 600*l.* a year, by a vote of two over those received by Mr. J. Price, of Liverpool, the difficulty of the Town Council being in distinguishing between the claims of the two gentlemen.

The Egyptian Government invite architects of all nationalities to send plans for the new museum to be built at Cairo. The sum allotted for the building is equal to 123,000*l.* sterling, and plans will be received at Cairo up to March 1, 1895. A prize of 630*l.* will be paid for the best plan submitted, and 420*l.* will be divided amongst the four next in order of merit. Architects wishing to compete can procure details by application to the Ministry of Public Works, Cairo.

Mr. Whistler's *White Girl*, a drawing, was sold on Saturday for 37 guineas, and his *On the Pier* and the *Japanese Parasol* for 40 guineas.

Bishop Hervey has bequeathed all his portraits of the Bishops of Bath and Wells, which are in the picture gallery of the Palace, to devolve as heirlooms with the Palace, but if his successor will not pay the legacy duty the portraits are left in trust for sale. The pastoral staff to the late bishop, the Glastonbury chair and Abbot Whiting's chair are also made heirlooms.

The Jamna Masjid, the principal mosque at Delhi, has been struck by lightning. The dome of the south minaret was injured, but no material damage done to the building.

Herr Karl Roux, a well-known painter of animals and idyllic scenes, and manager of the Picture Gallery at Mannheim, died there of typhus fever on Monday morning.

Mr. W. J. Tennant, architect, Pontefract, has obtained the first premium of 100*l.* in the competition for the market hall and public offices at Goole. The second prize was divided between Mr. Thorp of Goole, and Mr. Alton of Doncaster.

The late Mr. S. Sanders has bequeathed his picture *Tobit and the Angel*, by Elsheimer, to the National Gallery; his picture *Faith, Hope and Charity*, by Rubens, to his wife for life, and then to the Fitzwilliam Museum, Cambridge.

A Statue of the late Cardinal Newman, which will have a canopy of Portland stone, is to be erected outside the Oratory at South Kensington.

M. Leroux, a pupil of M. Bonnat, has gained the Grand Prix in painting, the subject being *Judith Presenting the Head of Holofernes to the Inhabitants of Bethulia*. Owing to the death of one of the students in the Villa Médicis, M. Déckenaud, who gained second place, will also be able to go to Rome.

The Credit assigned to the Minister of Public Works for the reconstruction of the Opéra Comique in Paris amounts to 1,034,114 francs.

The Dedication of the restored west front of Rochester Cathedral took place on Wednesday. The work has been carried out by Mr. Thompson, of Peterborough, under the direction of Mr. J. L. Pearson, R.A.

Mr. Delissa Joseph is the architect of West India House, Leadenhall Street, which was formally opened last Monday by Alderman and Sheriff Sir Joseph Dimsdale. It cost about 24,000*l.* The contractors were Messrs. John Allen & Sons.

The Lancashire Asylums Board have adopted the plans sent in by Messrs. Crisp & Oatley for the new asylum at Winwick, which the committee consider afford greater facilities for superintendence and cheap administration than any of the others.

The Annual Excursion of the Northern Architectural Association was held on Saturday at Thirsk, Rievaulx and neighbourhood. Twenty-seven members of the Association met at Thirsk, being from Newcastle, Gateshead, Morpeth, North and South Shields, Sunderland, Durham, Darlington, Middlesbrough and Leeds.

Leckhampton Court, one of the finest old residential estates in Gloucestershire, is in the market. It includes an ancient court-house. In the mansion is a lofty dining-room, which dates back to the reign of Henry VII. The outlying portions of the estate include the celebrated Devil's Chimney.

Mr. Francis T. Palgrave has presented to the National Gallery a small picture representing *The Holy Family*, by Eustache Le Sueur. Mr. A. Fowell Buxton has presented a portrait of an elderly lady by Jan A. van Ravesteijn. Neither of these masters has hitherto been represented in the national collection.

The Architect.

THE WEEK.

MR. WALTER PATER, who has died in Oxford, was one of the very few University teachers who could take an interest in art. It afforded him subjects which were adapted to his elaborated style. He was a fervent admirer of Renaissance work, and therefore of Greek sculpture. His essays on "The Myth of Demeter," "Dionysus," "The Beginnings of Greek Sculpture," "The Marbles of Ægina," "The School of Giorgione," and "A Prince of Court Painters," indicate his range of thought. He enjoyed abundant leisure as a fellow of Brasenose, and therefore was able to polish his few essays as long as he considered the operation was needful. But his style is supposed to possess so many charms that it has withdrawn attention from his merits as a thinker. Mr. PATER was born in London in 1839, and received his early education mainly in Canterbury.

ON Saturday Repton Church and Priory were visited by a party of members of the Archæological Section of the Birmingham and Midland Institute. The church is dedicated to St. WYSTAN, who was murdered in 849 and was buried in the monastery then existing at Repton, which had attained to such fame in those days, it had come to be regarded as the Westminster Abbey of Mercia, and burial within its precincts was accounted a great honour. Founded about the year 650, the monastery was destroyed by the Danes in 874; the Saxon crypt alone escaping the general devastation, and for about a hundred years there was probably no church at all in Repton, until in 970, when the later Saxon church was built on the site of the old monastery. The whole of the church (with the exception of the chancel) appears to have been restored in the Norman and again in the Early Decorated period, the spire being the latest addition, in the year 1340. There are consequently embraced within its walls all the various styles of architecture from Saxon to Perpendicular. In 1792 the old carvings were swept away and other "restoration" effected, and in 1854 two round Saxon arches at the east end of the nave were replaced with the present Pointed arches, for the sake of uniformity. The "horse-box" pews were removed and the ancient floor restored in 1885, at a cost of over 3,000*l.* The Saxon crypt, discovered by a gravedigger falling into it through the bottom of a grave he was digging, is almost unique. The Priory was built in 1172 by MATILDA, daughter of ROBERT, Earl of GLOUCESTER, son of HENRY I. In 1538 it shared the fate of most of the smaller monasteries, and was dissolved. The buildings and lands were assigned to one THOMAS THACKER, whose son, being alarmed with the news that Queen MARY had set up the abbeys again, pulled down three sides of the Priory in the year 1548. The remaining side is now the residence of one of the masters of Repton School.

THE works committee of the London School Board have completed their report for the year ending in last March. The cost of sites for school buildings was 99,500*l.*, the surveyors' fees and other charges being 1,175*l.* The value of all the sites purchased, or agreed to be purchased, previous to March 25, 1893, was 2,803,633*l.*, and the costs were 397,749*l.* The total cost, therefore, of the sites purchased up to March, 1894, was 2,900,906*l.*, while the charges amounted to 406,790*l.* The cost was equivalent to 6*l.* 17*s.* per child. Up to Lady Day, 1893, 383 permanent schools had been erected and used; and during the past year fourteen additional schools and twenty-five enlargements were opened. The fourteen new schools, including sites and furniture, cost 377,278*l.*; they afford accommodation for 13,669 children, and the average cost per head had thus been 27*l.* 12*s.* The amount expended on the enlargements, which provided additional accommodation for 8,246 children, was 153,907*l.* The average cost per head of the school buildings and of the furniture, the accounts for which were completed prior to Lady Day, 1894, is as follows:—School buildings (ex-

clusive of sites), 11*l.* 14*s.* 7*d.*; furniture (such portion as was chargeable to capital account), 10*s.* 6*d.* In addition to the accommodation provided during the year tenders have been accepted for more places. Since December, 1892, a thorough inspection of the drains of the schools has been proceeding, and up to March last 355 schools had been inspected. The Board appointed a sanitary surveyor for the purpose of superintending the drainage works. The system of carrying out repairs to buildings by workmen employed by the Board is being continued in nine of the eighteen districts, and the repairs to furniture are now being done by the Board's own men. Nearly one hundred workmen are thus employed by the Board, without the intervention of contractors, at the rate of wages mutually agreed upon by the Central Association of Master Builders of London and the London Building Trade Federation.

A COMPLETE collection of the ancient inscriptions from Asia Minor is about to be published by the Imperial Austrian Academy of Science. The first volume is to contain those of the province of Lycia. More than 13,000 inscriptions have been collected, and of these 1,400 are from Lycia, containing 133 in the oldest Lycian language, which no one can as yet translate. In this first volume the researches and labours of learned Englishmen in past days down to the excellent work of Professor RAMSAY will receive special and honourable mention. But, unfortunately, Professor OTTO BENNDORF, of the Vienna University, who first suggested the above work and is now superintending its publication, has not been able to find the original copies of Lycian inscriptions which were made by the late Rev. E. T. DANIELL in 1840 when travelling with Admiral SPRATT's expedition in Asia Minor. Only a small number of the Lycian inscriptions, which Mr. DANIELL copied with such great care and accuracy, were published. It is, therefore, of the greatest importance in the interests of palæography to find out whether the manuscript copies of the Rev. E. T. DANIELL are still in existence, and what has become of the excellent and accurate copies he made more than fifty years ago. Can any of our readers afford a clue to them? Mr. DANIELL died of fever in Adalia, Asia Minor. His work is so excellent and his copies so accurate that Professor OTTO BENNDORF is most anxious, before publishing the first volume, to obtain if possible a sight of his original manuscripts, especially as he copied more than those few which were published by Admiral SPRATT, and because some of the original inscriptions of which Mr. DANIELL made copies have not been found again, and may easily have been destroyed since then. Any information will be gladly received by Mr. HECHLER, the chaplain to the British Embassy in Vienna.

THE interest which is now taken in England in examples of old Domestic architecture appears to have excited a corresponding desire in Germany to cultivate the national style. By the Union of German Architects and Engineers it is therefore proposed to undertake an immense work on the houses of the peasantry and farmers. From the inquiries which have been made, it appears there will be little difficulty found in acquiring the information which will be requisite to explain the history of the most ancient examples. Brunswick is expected to be one of the most fertile regions for the purpose. In fact, there is so much available that to exhaust the subject it will be necessary to invoke the aid of the Government in the form of subsidies.

A PRIZE amounting to 50*l.* was founded by the late M. BAILLY, architect, president of the Société des Artistes Français. It is to be awarded annually by the Académie des Beaux-Arts, and the intention of the founder was that it should become a recognition of the completion of some important work of architecture. On Saturday last M. LEOPOLD HARDY obtained it on account of the church of Notre Dame, at Lourdes. The Grand Prix de Rome for sculpture has been also awarded by the Academy. The prizeman is M. CONSTANT ROUX, a pupil of MM. CAVELIER and BARRIAS. The subject was *Achilles putting on his Armour after the Death of Patroclus*.

WORKSHOP RECONSTRUCTION AND CITIZENSHIP.*

IN a prefatory note Mr. ASHBEE offers an excuse for the almost fragmentary form of his book by saying the parts have been written "as they have been called for, at different times during the last six years, and they have served in most cases to illustrate some workshop endeavour or some educational principle." As one idea inspires all the pages, the majority of readers would probably not realise that fragments were put before them if the author had not informed them. Whatever it may be called, the book is one which can afford more enjoyment than is commonly derived when technical education is the subject. That Mr. ASHBEE has literary skill is unquestionable, and he has mastered his subject not by considering it at a distance, but at close quarters, and with intellect that was made more acute by affection and enthusiasm.

Let no contractor or manufacturer, however, imagine he will find in the pages any suggestions which will enable him to turn out work more expeditiously and cheaply. That would be a mistake like the agriculturist's who invested in Mr. RUSKIN's "Construction of Sheepfolds" with an eye to business. Mr. ASHBEE is not disposed to aid in making the existing system of production more profitable to anybody, for his aim is to supersede it. If he takes up Tools and the Man as a subject, it is because he believes that if used in the way he suggests the man can be exalted and made more happy by the tools. At one time much was supposed to be gained by the belief in "laborare est orare." The modern gospel, at least among the zealous men who are spending their strength in trying to humanise the East End, would go even further, for holding the belief that Beauty is Truth, and Truth is divine, they would try to make heaven on earth by an organisation in which art would be paramount and the humblest drudgery would become refined, so long as it was a means towards that end. Mr. ASHBEE expresses his own and his friends' aspirations when he says:—

To cultivate the sense of Beauty does pay in the long run; it is worth our while as a nation to do it. Beauty, I repeat, is meant for the enjoyment of man, but its understanding comes before its enjoyment. To understand, we must reconstruct the workshop and remodel the citizen concurrently, and, in spite of the unwholesome precepts of St. Paul and their natural outcome in seventeenth-century puritanism, eighteenth-century torpor and nineteenth-century godliness and commerce, I venture to think Christ knew what He was about when He presided at the marriage of Cana and turned the water into wine.

It will be said of course that an attempt to advance civilisation by art workmanship, craftsmanship, or whatever name we apply to such art as is not admitted by the Royal Academy, is as vain as Mrs. PARTINGTON's attempt to mop up the ocean. But a great many efforts that have been beneficial appeared at first no less absurd. The Mrs. PARTINGTONS of the history of progress form a band that is not to be despised. It may not be possible to transform Mile End and Whitechapel before the century comes to an end, but if the lives of a small fraction of the inhabitants can be made happier by a social experiment which inflicts no loss on the rest of the community, surely it is worth encouragement. Mr. ASHBEE and his fellow toilers may be considered quixotic, but so long as they assume the risks of any derangement to the machinery of the windmills of commerce, they are not very dangerous. Who knows whether by their tilting weak spots in the gearing may not be discovered which otherwise would escape notice?

His experience in teaching is not without effect on the style of Mr. ASHBEE's book. He must by this time have discovered that abstractions are rarely so impressive as the concrete reality, and therefore he adopts the most concrete of all forms, which is the dramatic. He has his characters, and he takes his share in the dialogue. Mr. ARCHIBALD PUSHTON, M.P., of the great house of SKY SIGN & Co.; JOHN PENNYWORTH, the designer in the "H" department of that house; THOMAS TRUDGE, who is one of its producers; TIMOTHY THUMBS, the head-master of the Grinders Street Board School; the Rev. SIMON FLUX, who is willing to employ art or anything else which will give him influence on his congregation, and the Rev. PETTIFER JUGGE, who

believes politics are more serviceable than æsthetics for a parson's purpose, come far nearer to living beings than nine-tenths of the characters which we have met with in novels which have the East End for a territory. In these holiday times we recommend our readers to prefer Mr. ASHBEE's book to any of those social fictions. They will find it will serve the great end of all literature in making them forget trouble for a brief time; but it must also be said they will have to think about what is said long afterwards. Economists even, who have to believe in the existing system of organisation—for it is supposed in a way to be their creation—will at least admit that Mr. ASHBEE has revealed varieties of life which are worth some consideration. There is one class of men who especially should make it a duty to become acquainted with the suggestions in the book. They are the county councillors, committees of polytechnics or trade schools and all authorities who dispense money for what is called technical education. There is no doubt that the subject is causing extravagance that is not creditable to the business habits of the country. Mr. ASHBEE has been enabled to train youths and drill them into competent workmen at an expense which will appear incredible in many a county council committee-room. He is, therefore, warranted in supposing that what has been done in the Mile End Road is attainable elsewhere. One of his suggestions is as old as education itself, for he gives the master precedence over system:—

For my part, I think that the first thing we have to do is to accept the principle of mastership. The mastership not of a department, but of an individual. First, we must have our good master, and we must pay him well. Then we might have him controlled, or guided possibly on occasion, by a committee of experts, men who understand the study of decorative art in the more general sense, each in their own line, architects or designers or painters; with these experts we should put some business men, who have a practical knowledge of the master and of the openings in the industry in question. But it is your master who is the important man; he will give his life to it, the man on whom your schools' future depends, and the most important things about him are his own creative capacity and his relation to his pupils. A man is no good as a master for having passed standards only, that is a paper qualification; he is no good as a master for having technical power only, that is a metallic or a wooden qualification, or at least one limited to the stuff which he works; but the greatness of a good master is that he himself produces, and that he works in men as much as in metals, wood and paper—he must have something magnetic about him. Hence the pupils must have their say in the choice of the master. It is the pupil who is the master's best judge. Therefore the students at our polytechnics should, as far as possible, elect their own master. It is this which was done in the Middle Ages at the universities, where the boy scholars came to hear a good teacher; it is this which gives vitality to the outside ateliers of modern Paris, and the same end should be attained, though it can only be done by slow degrees, at our polytechnics. How to make for it? I answer by telling the students, pupils, workmen, be as independent as possible; by inviting representations from the unions and trade bodies and clubs of the district in which your polytechnic is to be.

The relation of the architect cannot be ignored in any project of workshop or world reconstruction. Mr. ASHBEE introduces, with some variations, the remarkable address on the subject which he read before the Architectural Association two years ago. He proposes the realisation of a suggestion of Sir CHARLES BARRY, that the architect should become the building contractor, and which it is believed would be easy if trades union and co-operative principles were frankly accepted. In enforcing the principle Mr. ASHBEE adopts his favourite plan of putting a living illustration of some kind before us, for he says:—

I know an old gentleman in Mile End—an octogenarian mason with both legs in the grave, for he carves nothing but tombstones—who was trained by Pugin in the Westminster work. He looks back to it as a sort of golden age—it was the time he got real nice work to do—but what has come out of it? There was no effort made to hold the men together, beyond the immediate cash nexus of the contract, and when the great job was done they all drifted apart. Pugin's preaching of Mediævalism and Barry's ideas for the development of contract were all futile and to no purpose for want of an understanding of the social and constructive side of the workshop. The whole tradition was wasted, and my old friend threw his chisel on one side and went into the tombstone line. He now walks about, a small, a very small, master, in a long, a very long, black coat and a very tall top hat, looks like a mute, swears at the indifference of the workmen he employs, but still he does not forget the golden age.

Unless we are mistaken, both PUGIN and his eldest son could confess to a great amount of swearing of terrible oaths committed through the same cause. It was not a golden age for the PUGINS, for the workmen took care to make

* *A Few Chapters on Workshop Reconstruction and Citizenship.* By C. R. Ashbee, M.A., architect, King's College, Cambridge. Published by the Guild and School of Handicraft.

them suffer losses. Mr. ASHBEE would say that only confirms his argument about a neglect of the social-element in the workshop and the necessity of its reconstruction. At any rate, we hope sincerely that he will never have reason to complain of workmen, for ingratitude towards such a teacher and missionary should be unpardonable.

QUOTATIONS ABOUT IRON.*

WE are not, we hope, committing an indiscretion by saying that some of the books which bear the names of architects are in reality advertisements for circulation among prospective clients. If Mr. HARRIS'S "Three Periods" could be considered as one of them it would be entitled to praise on many accounts. In preparing such works, which can only have an indirect sort of success for the author and are rarely read with care, it is wise to produce the utmost effect with the least amount of labour. Now we doubt if in the whole collection of the British Museum an example is to be found in which the right to be considered an author was acquired on such easy terms as in the book we have now before us. At least one-half of the matter consists of extracts from other books. We must give Mr. HARRIS the credit for his courage, in making it apparent to all who take up the volume that his "Three Periods" is a thing of shreds and patches instead of a literary composition, since he prints his spoils from books in smaller type. When fifteen or sixteen pages of the kind follow in succession, the humble rôle which Mr. HARRIS condescends to perform in the production becomes manifest. So numerous are the extracts the printers found it difficult to dispose of them, for Mr. HARRIS has to admit "the apparent abruptness of some of the quotations, they being for the most part introduced with little attempt at constructive arrangement."

It would, perhaps, be better if the method of printing had been reversed, by allowing the extracts which form the parts of the book that have a claim to be considered to appear in the larger type. Mr. HARRIS probably could not persuade the printers to depart from precedent. We are sure he would admit that he does not appear to advantage when he attempts to point the moral of his quotations. In his eagerness to secure attention for the cause he has taken up he becomes rather confused in his utterances, and what may arise from nervousness is likely by unkindly judges to be ascribed to a different cause. He is too full of his subject, or his soul is too perturbed, to treat simple things in a simple way, and instead he tries to be figurative with a contemptuous indifference to what figures involve. A sentence, for example, will begin in this way, "For some 250 years we have been doomed to grope among a chaos of styles;" then the writer's attention is diverted by various circumstances, and, forgetful of chaos, he finishes his sentence by saying "without either the ability or the courage to free ourselves from the clutches of this deadening architectural octopus." Students of natural history will be astonished at the evolutionary power which, in the course of a sentence, can turn styles into an octopus. Mr. HARRIS, we hope, was not ambitious to rival the orator who said, "I smell a rat, I see it floating in the air, but I will nip it in the bud."

The aim of Mr. HARRIS'S book is to convert architects into a belief that there is nothing like iron, except aluminium, as a building material. We may therefore suppose that he is a devotee of science. But hard-headed men of that kind often fail through the weakness of their hearts. We are afraid Mr. HARRIS is a sentimentalist, and subjected to the gentlest of emotions. A book with such a name on the title-page and coming from Holborn naturally suggests the patroness of the excellent Mrs. GAMP and the sensitive spouse of that lady. We learn that he was compelled through affection and remorse periodically to shelter his head in the doghouse, and his howls were then awful. There are tender passages in Mr. HARRIS'S "Three Periods" which suggest affinity with that model of the domestic virtues. Who is it can read the following pathetic words, "A man in the evening of life contemplating the portrait of the wife of his youth, who

died young, seems to afford an apt analogy of the relationship existing between the evolved plan and the petrified elevation" in any place, and especially in a book on metallic architecture, without being overcome? It is true the meaning of the sentence is not clear prosaically, even when we read it backwards; but that increases the effect. As much might be said of a melody by BEETHOVEN. But a man cannot worship lovely woman even with a scientific object in view without suffering in many ways. Mr. HARRIS has modestly refrained from prefacing his book with an autobiography, but there are passages relating to architecture and materials which we imagine are only symbolical of many a bitter pang. Great writers have a knack of turning their woes into "copy," and are relieved by the operation. There are events which are harder to bear than the death of the wife of one's youth, and do we not seem to have an indication of a catastrophe such as can never be forgotten were one to live as long as the patriarchs in the following soliloquy, where Mr. HARRIS ostensibly treats of the appearance of the Renaissance among us? "This alliance with the fascinating foreigner was a dangerous game to play, for the bands of roses were soon metamorphosed into chains of iron, and the generous and too confiding entertainer was soon ousted by the perfidious and insinuating guest." In those words it is evidently memory, with a petrified elevation, which speaks, and the recollection of the chains of iron must inflict keen pain on a man whose mission Destiny has decreed is to persuade the world to believe in the ferruginous virtues.

As we have said, Mr. HARRIS, with all his science, has a heart. He is therefore merciful. May we not suppose that the following passage, beneath a thin disguise of science, is autobiographical, and affords an example to all who have been made to suffer through victims of fickleness?

It is a new system of construction which primarily demands our attention, and having attained that, the artistic development of it will follow naturally, and the "new style" will be realised—a nineteenth or twentieth century, a "Victorian" architecture which may rightly claim to be a lineal descendant of the national style so unfortunately brought to a halt in the sixteenth century, but neither slain nor even maimed by the vigorous attacks of the Renaissance—a victim of fickleness, 'tis true, but nothing worse; and since the Italian charmer can do nothing more for us, let us return to our first love, satisfied that she, returning to purity and simplicity, will be content to cast aside the foreign garb in which she has so long been forced to masquerade, and will deck herself with new materials, so long as they demand of her no sacrifice of truth. Holding high principles, she will agree to nothing which will compromise them; but she will adapt herself to all the various requirements of modern life, and supply the architectural needs of all sorts and conditions of men, having a working dress for the warehouse, a devotional one for the church, and a robe of state for the palace, but, above all, a domestic one for the home.

A less kindly nature would believe that a victim of fickleness would never become stable in virtue, but who can gauge the degree of reform which may arise from the possession of a devotional frock as well as a robe of state and a workaday gown? We do not profess to be competent to judge of affairs so delicate, but when Mr. HARRIS asks, "Which of the two ideas is most in accord with the best part of our nature—one lovingly clinging to the past till time had effaced all its memories, the other treating it with contempt as a despised thing, to be forgotten and buried without remorse or a single kindly thought?" we force ourselves to answer with him, "It is not difficult to decide." At the same time we would premise that the clinging is not to take place in winter, for we have no ambition to awake and find ourselves a petrified elevation.

The favoured ladies and gentlemen who will enjoy the privilege of receiving the "Three Periods of English Architecture," with the author's compliments, will of course be able to appreciate all that is veiled by professional phraseology. They may not, however, realise that if the author had only set out to prove the advantages of metal which entitle it to become "the most prominent building material of the future," he would not be satisfied with printing quotations and interpolated remarks. Mr. HARRIS must know that since architecture began neither a new construction nor a new style was created by the writing or compiling of a book. PAXTON, who was practised in that sort of work, did not initiate his project for the Exhibition of 1851 by its aid. He began with a rough sketch on a sheet of blotting-paper, which occupied him

* *Three Periods of English Architecture*. 1. At work. 2. Asleep. 3. Awaking. By Thomas Harris, F.R.I.B.A. London: Batsford.

while he was supposed to be taking notes about the misdeeds of the railway porters arraigned before him. It was by means of drawings that the novel notion became attractive to the commissioners and the public. If the advocates of a new style are sincere, why do they avoid making drawings and models of what they contemplate? OWEN JONES had a belief, like Mr. HARRIS, about the fitness of iron for the construction of other things besides girders. He was not afraid to design a cast-iron shop-front, and although it was rejected at the Royal Academy he was not daunted, and published it in *The Architect*. Later men talk and write on the subject, but they have not the courage to suggest what they recommend. They leave the risks of the experiment to others. It would be easy, we suppose, for Mr. HARRIS to give an indication of some of the wonderful things which he says are practicable, but he carefully avoids that test. As if he and men like him were great benefactors to humanity, he bequeaths his stock of proposals to young architects, men who, if they attempted to take up novelties that did not attract, would be ruined. As he says:—"It is mainly to the younger men who have the world before them that our hopes turn; they are the units of the power which must work the change. Will they fail us, or with growing interest in, and profound enthusiasm for their profession, will they, availing themselves of the increasing possibilities of their time, so work that the advent of a new century may witness the awaking of architecture from her protracted sleep?" The younger men will be able to interpret that part at least of Mr. HARRIS's book. They will realise that all this munificence means, "Make experiments for us; if they are successful in the eyes of the public we shall honour you by adopting them for our guidance, just as we employ extracts to make up our books; if they fail, you will of course accept all the consequences." Such conduct is not, however, likely to be of much avail in creating a new style.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual meeting of the Bristol and Gloucestershire Archæological Society was held last week at Ledbury. Mr. Michael Biddulph, the president, said he proposed to confine his remarks to objects in the immediate neighbourhood, some of which they would see during their excursions; and he would begin with a reference to the oldest monument of antiquity he knew in that district, and that was the magnificent old camp at the Herefordshire Beacon. The entrenchment could be seen for many miles distant, and he thought it must be one of the most ancient monuments in that island. The date he presumed was unknown and was quite lost in antiquity. He supposed it might be called prehistoric. There was no doubt it was constructed by the early tribes who inhabited that part of the country long before the arrival of the Romans. He would give a great deal to know who were the people who constructed that camp and the different scenes witnessed there. One could not fail to be struck by seeing the immense size of the entrenchments; they went for a long way round the hill and in fact they enclosed a very large space; but when they bore in mind that the camp formed a refuge and resting-place for a whole tribe, and not only that, but there were the cattle, and perhaps the cattle of their neighbours which they had stolen, they might understand that they required a considerable space to make a stronghold. There were a number of other camps in the neighbourhood, one Wall Hills Camp, which no doubt was very much the same age. As for Roman remains in that neighbourhood they had not very many. There were some at Hereford and at the other side of the county, but he did not know that they had ever found any Roman remains in the immediate neighbourhood of Ledbury, though he might be mistaken. He referred to the mention of the town in Domesday Book, and said that in 1304 Ledbury returned two members to Parliament, though it did not appear to have returned members after that time. He supposed then, compared with the rest of the county, it was a town of considerable importance. They knew there were cloth manufacturers in the place, and generally there was a thriving and well-to-do population. He spoke of Ledbury at the time of the Civil War, and the battle which took place there in 1645 between the forces of the Governor of Gloucester and Prince Rupert. He regretted that there were no traditions of the battle among the people of the locality, and generally there was an absence of traditions in England, whereas in Scotland, Ireland and Wales the people had many traditions of their forefathers. He

believed there was hardly a working man about there who had heard of the battle of Waterloo.

Alderman Fox proposed a vote of thanks to Mr. Biddulph for his address, and endorsed what he had said of how little the peasantry knew of events in the past that had happened in their own neighbourhood.

Mr. Tuckett would like to hear something about the interesting room of the town hall in which they were assembled.

The President said if he were to enter into the date of that room he would be sure to find someone to contradict him. Some persons attributed the date to the reign of Elizabeth, and others to a period afterwards. He would like to hear someone's view as to the probable date.

Mr. G. H. Piper said there was a town hall there in the time of King Stephen, but he believed the present building was erected in the time of Charles II. No doubt some of the timbers of the old building were used in the present one.

The Rev. W. Bazeley asked if they could not induce the Board schools to teach archæology, which was better than a great deal of rubbish the children learned. Might not the outcome of that meeting be to restore some of the traditions which their President told them were rapidly fading away? When they heard with horror that the people of Ledbury had not heard of the battle of Waterloo, they should take up the subject and plead for it. They ought to do what they could to keep up the old traditions of their people, as upon them, to a great extent, depended the sort of good feeling and English love of everything that was good and true.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

ON Monday the fifty-first annual meeting of the British Archæological Association began in Manchester. The members were received in the Town Hall by the Mayor, who expressed a hope that they would be able to derive much interest and information from their visit.

The treasurer of the Association, Mr. Allan Wyon, in returning thanks, said that in looking over some documents recently he found that the Manchester Grammar School was founded by Hugh Oldham, Bishop of Exeter, in 1519, now 375 years ago, and he said that in founding that college he did it "out of the good mind he bore to the county of Lancashire, perceiving that the children thereof have a pregnant wit, but are for the most part brought up rudely and idly." That was the description which was given by a Lancashire man, so he supposed there was no offence in repeating it on the present occasion. In 1724 he found Dr. Stukeley speaking of Manchester as "the largest, most rich and populous and busy village in England." It appeared, therefore, from their own descriptions in the past that Manchester had been famous for having a most "pregnant wit" and being very busy. Dr. Stukeley, however, differed from Bishop Oldham, who said that the people had been idly brought up. Certainly there was no trace of idleness now, when they looked round this magnificent city. Village which it was in 1724, it had now 500,000 inhabitants, and its goods were called by the name of the city, and were a recognised commodity in every market of the world. Manchester itself gave a name to a port to which ships of the largest tonnage could come from any of the shores of the globe, and in face of these things they must acknowledge that the enterprise and energy of the people gave a refutation to the statement of Bishop Oldham that the people were at all idle. But the "pregnant wit" which the bishop recognised was still manifested in their midst, as was evident when they looked round upon the few things they had been able to see during the short time they had been in the city. They were struck with the magnificent waterworks. Manchester, he believed, had already a supply of 25,000,000 gallons daily; and when they looked at the larger waterworks already constructed from Thirlmere they saw, indeed, that the people of Manchester were not an idle people, but a people of remarkable enterprise. That must strike even the meanest capacity. Then, as they had walked about and seen the noble buildings—the Assize Courts and that magnificent Town Hall in which they were assembled—he felt that they were with a people who certainly had given refutation to the charge that was brought against them by their own townsman 375 years ago, that they were in any way idle. Then there was that magnificent pile of buildings which he had had the privilege of going over that morning—he meant Owens College, founded in 1846 as a fountain of intellectual knowledge for the welfare of the people. The Association had come to Manchester for the purpose of studying archæology in the city and the neighbouring parts of the country. The study of archæology claimed to have the effect of helping on that refinement of thought and mind which prevented people from being styled rude, as Bishop Oldham spoke of them. The local Lancashire and Cheshire Antiquarian Society, with its 320 members, was an efficient society, and to their cordial co-

operation on the present occasion the Association were very much indebted.

In the afternoon the members visited Manchester Cathedral, which was described by the Rev. E. F. Letts, who afterwards conducted the party to Chetham's Hospital.

At the conversazione in the evening Mr. J. P. Earwaker gave an account of the acquisition of the manorial rights of Manchester by the Corporation from Sir Oswald Mosley, and of the various charters and ancient documents relating to the manor of Manchester which are in the possession of the Corporation. He said the last instalments of the purchase-money of the manorial rights would be paid in the present year, when the Corporation would become the absolute lords of the manor of Manchester. The Court Leet Records which came into the possession of the Corporation began in 1552, and they had recently been printed. They contained a large amount of interesting and curious information relating to the early history of Manchester. The old constables' accounts also were now available to the historical student in printed form. The first volume of the Records dated from 1552 down to 1586, extending over the reign of Queen Mary and a large part of the reign of Queen Elizabeth. Most of the early documents relating to the manor of Manchester were written in Latin or Norman French. These had been translated, and furnished a large amount of information of interest to the historical and archaeological student. There were indeed few Corporations of much older standing than that of Manchester which possessed so fine a collection of historical municipal documents.

SHROPSHIRE HOUSES.

IN the address which Mr. Stanley Leighton, M.P., delivered as president of one of the sections at the meeting of the Archaeological Institute, he said:—The history of a county, of a borough, of a parish, is in miniature the history of the nation. No one can thoroughly understand the course of national events who is not conversant with the local and personal currents which give volume to the stream. In England the county and the parish have retained through centuries their identity and their homogeneity. So if any one has mastered the history of a locality he has the key to the history of his country. An acquaintance with "Eyton's Antiquities of Shropshire" cannot be acquired without at the same time realising the great reconstruction which the Normans introduced into England. "Baxter's Autobiography" and "Gough's History" represent, in the most graphic form, the local and personal forces which led to the rebellion, the commonwealth, the restoration and the revolution. A faithful study of what remains to us of the past helps us to appreciate the continuity of change, both in the outward appearance of the country and the personality of its inhabitants. Six centuries ago there were twelve stately religious houses in Shropshire, a hospital of the knights templars and a certain number of friaries. They are all gone. There were at the same time over forty castles in Shropshire. They are all gone as residences of importance. I can only recall three or four which have a vestige of roof left upon their walls. Stokesay is a beautiful but dismantled shell. Shrewsbury Castle, of which Leland says "it hath been a strange thing, but is now much in ruin," suffered still further disfigurement in the beginning of this century at the hands of Laura, Countess of Bath, and Telford, the famous road engineer. Wattlesborough is used as a farm-house, and its square Norman tower is covered with a modern roof. Apley is used as a stable, and little but the foundation is left. Ruins and dismantled houses each have their own story to tell, which will generally repay the trouble of discovery. Stokesay points to the rise of commerce, one of the powerful factors in England's greatness. Its builder was Laurence, a clothier, of Ludlow, who adopted the name of his town, and erected this charming castellated mansion in 1290. "It was not," says Eyton, "till the reign of Edward I. that mercantile wealth could thus readily be exchanged for territorial importance." After passing by heirship to the Vernons, Stokesay again fell into mercantile hands, and was purchased in the reign of Elizabeth or James I. by the aldermanic family of Craven, by whom it was sold again for money made in business to the family of its present owners. I have pointed out how entirely the castles have disappeared as residences. It is difficult to put one's hand on an inhabited house of the fourteenth century, and not easy to find one of the fifteenth and the sixteenth centuries. The most ancient residence in Shropshire, still used, I believe to be the Prior's House at Wenlock, and it is certainly one of the most interesting. Since the dissolution it has passed through many hands, and it is now, happily, in the possession of one who well knows how to preserve its character. I will mention a few other old houses. Plash, near Cardington, can show some remains of Tudor Gothic, intermixed with Elizabethan work, and it has not been much touched during the last two centuries and a half, until it was lately carefully

restored. Condover is the best example of the later Elizabethan style in the county. The Whitehall, however, in Shrewsbury, is perhaps, as a whole, more characteristic, because its surroundings, its gatehouse, its dovecot, its walled gardens and its stables are still pretty much as they were. There is a good example of an early seventeenth-century dovecot and barn at Hodnet. Whitton Court, near Ludlow, Lydston in Claverley, Madeley Court, Lutwyche, Belswardyne, Shipston, Upton Cressett and Plowden are among the sixteenth and seventeenth-century houses which are still maintained as residences. But generally we must seek for old specimens of Domestic architecture in farmhouses, and in many of those cases the old character is well preserved. Black and white timbered houses are to be found all over Shropshire, especially in the towns, and above all other towns in Shrewsbury. Pitchford ranks as the best specimen of a country house in this style as a whole, but the frontage of Park Hall, near Oswestry, will bear comparison with many façades of this class in England. The Marsh or March, in the parish of Westbury, is a small black and white house, and has been excellently restored quite recently, and the same may be said of the Black Birches. Molverley Church, Halston Chapel and Park Hall Chapel are examples of the use of this style in ecclesiastical buildings. The stately but ruinous shell of Moreton Corbet is a fine Jacobean design of the first-rate order. The house was burnt down before it was inhabited, and has never been rebuilt. I draw near to my conclusion, and return to the point from whence I began, that acquaintance in the local evidences of history makes us admit that there are fewer old things of man's contrivance in the world than some people think. Go into any house, and how little can you lay your hands upon that has been in that house for a hundred years? You may see in any well-appointed house books and furniture, and swords and armour, and lace and jewellery, and silver and pewter, linen and tapestry and pictures, but how little, even though it be old, has been in the house for long—how little has been seen by those who lived three centuries ago? There were few books, few pictures, few ornaments in a country house even in the seventeenth century. The old inventories testify to the simplicity, not to say ruggedness, of the lives of our ancestors. So when people bring treasures of art, and especially when they bring portraits to an old house, they should not be ashamed of labelling them, in order that old things which have been purchased may not be mistaken for old things which were brought into the house when they were new and have grown old in the same place. A house may be built in a year—a home cannot be made in a year or in a generation. When people build new houses, by way of making what they call a good job of it, instead of carefully repairing the old ones they destroy a homeliness which they themselves will never see again. More harm has been done by too lavish reconstruction than by neglect. Shropshire has largely benefited in every generation from new-comers, and every generation of men has added to its pleasant residences, and none more than the present.

I think that here the ancient and the modern fairly combine together and every day grow into closer harmony. Certainly people are not so set upon pulling down in order that they may rebuild now as they were in the last century. There is greater reverence for the past and a better reading of its story. In this county something yet remains here and there which is not new, and a genuine sentiment pervades those habitations which have witnessed the exits and the entrances of many a generation. I hope it will never fade away.

TESSERÆ.

The Doric Order.

IT is difficult, if not impossible, to ascertain where and in what manner the Doric order originated. The story of Vitruvius, even supposing it rational, does not coincide with the Greek style of Doric at all, but if with anything with the Roman examples of it, which at the best are mean and inelegant deteriorations of the simple and beautiful original. This author says that "Dorus, the son of Hellenus and of the nymph Orseis, king of Achaia and of all the Peloponnesus, having formerly built a temple to Juno in the ancient city of Argos, this temple was found by chance to be in that manner which we call Doric." In another place he deduces the arrangements of this same order from those of a primitive log-hut in the first place, through all the refinements of carpentry, leaving nothing to chance, but settling with the utmost precision what in the latter suggested the various parts of the former. Chance in one case and experience in another, however, are not enough for this author; but he also tells us that the Doric column was modelled by the Grecian colonists in Asia Minor on the proportions of the male human figure, and was made six diameters in height, because a man was found to be six times the length of his foot, and that eventual improvements occasioned the column to be made one

diameter more, or seven instead of six. "Thus the Doric column was adapted to edifices, having the proportions, strength and beauty of the body of a man." The earliest examples of this order, however, are those which least agree with the primitive forms and proportions of Vitruvius; the columns at Corinth hardly exceed four diameters in height, while in later examples they gradually extend till, in the Temple of Minerva on the promontory of Sunium, the columns are nearly six diameters, being one of the tallest specimens of pure Greek origin ever executed. If the trunks of trees used in the structure of tents suggested the first idea of columns, and of the Doric in particular, as many contend, how is it that the earliest specimens discovered are the most massive? For the merest saplings would have formed the wooden proto-columns, and necessarily, when imitated in stone, they would not have been made more bulky than the less tenacious nature of the material required, much less would the slender wooden architrave have been magnified into the ponderous entablature of the primitive permanent architectural structures of all nations.

Oblique Pressure and Classic Architecture.

Greek architecture having in itself few elements of change or corruption, survived in tolerable purity for a longer period than any other known system, and even in its latest works (few of which, however, were durable enough to remain to us) it escaped one fault that seems to have had a great share in breaking up all other styles (the Egyptian, Roman, Hindoo, Arabian and Gothic, for instance), viz. the use, as ornaments, of miniature models of the principal features—the puerility that led in Egypt to making a capital like a little house or temple; at Rome and Baalbec, to enclosing a niche with small columns and a pediment; in Gothic England, to applying buttresses and pinnacles without number; in India, to a similar crowd of modelled colonnades, verandahs and domes; and in Moslem lands, to shelves and cupboards like cloisters, and to that multiplication of little sham vaultings that have obtained the name of the stalactite ceiling; the object of all being to get false magnitude by diminishing the scale, an artifice that never succeeds except on paper, on which these things often look vast and sublime, but never in reality. The Greek system escaped all this, but one constructive change, the introduction of oblique pressure, destroyed it. The Romans succeeded in imitating no order but the Corinthian, and this only when they adhered strictly (at least externally) to Greek construction as well as decoration, as in the Pantheon portico, the temples of Nismes and Baalbec. The columns and entablatures stuck on the face of an arcade, as in the Colosseum, are a constructive lie, but not, as some suppose, a huge ornament. The lie consists in their appearing a mere ornament, while they are really indispensable to stability, for these columns are really the buttresses or props of the internal vaulted ceiling, and they would have to stand out obliquely and form apparent props were it not for their entablature, which often itself a piece of disguised arch construction, in order to throw all its weight on the columns, serves the purpose of the Gothic pinnacle to steady the column below against the side thrust, by combining its vertical pressure with the oblique thrust to produce a resultant more nearly vertical, and capable of being confined within the foot of a vertically placed column. But the column is false, because it appears made to sustain the vertical pressure alone. Being a prop it should have appeared one; but this was never attempted till the thirteenth century. Till then propping, though a sound principle in building, was considered an improper one to appear in architecture, and this one disguise kept the art for fifteen centuries in a continually deepening degradation. The arch was introduced by the Etruscans or Romans; but its necessary attendant, the prop, was struggled against for fifteen centuries before architects would admit it without a mask.

Vitruvius.

Vitruvius, being ignorant of any other than his native architecture, which was Roman, and generally derived from the Greek, concocted or adopted a silly fable about the origin of building, and pretends to trace from it the invention of what are called "the orders" by the Greeks, giving, however, to each a separate fable of its own. He professes to give the proportions, arrangements and disposition of the architectural works of the latter people and the rules by which they were composed. He describes with considerable minuteness various species of temples and other edifices of both the Greeks and Romans, and endeavours to give reasons for almost everything connected with them. His account of the advance of man from a state of savage wildness to civilisation, the discovery and acquisition of fire and progress in the art of building made by the early fathers of the human race is only surpassed in absurdity by his stories of the invention and proportioning of the various columnar ordinances of which the ancients made use; if we except perhaps the fact that this crude system has been received and propagated throughout the civilised world ever since the resuscitation of the work four centuries ago. How

could a man who evidently knew nothing of the early history of the world, of the Celtic monuments or of the history and architecture of Egypt and the East be supposed capable of describing the inventions and advances in knowledge of the human race? Nor is this all. How can Vitruvius be received as an authority when it is found that he does not correctly describe any existing edifice in either Greece or Italy, and that no example of ancient architecture, either Greek or Roman, is in perfect accordance with his laws?

Roman Mausolea.

As works of architecture the sepulchral monuments of the Romans were of more importance than their domestic structures. There is more architectural display in the "Street of the Tombs" at Pompeii than in any street of the city itself, and the mausoleum of Hadrian on the right bank of the Tiber at Rome was a much more important object in its perfect state than his villa near Tivoli could ever have been. It was perhaps the most splendid structure of the kind ever executed, excelling the Memphian pyramids as much in architectural pretence as they surpass it in magnitude. There was, too, a degree of harmony and simplicity in its composition, which can only be accounted for by supposing that the imperial builder, who was himself an adept in architecture, had acquired better taste than the architects of Rome generally possessed, by the contemplation of the monuments of Greece and Egypt. It consisted of a deep quadrangular basement, each of whose sides was about 250 feet in length. This was surmounted by a lofty circular mass, on which was a graduated stylobate, supporting a noble peristyle of Corinthian columns with their entablature, forming, with its circular cone, a species of peristylar temple, something like that below the cupola of St. Paul's Cathedral in London. Above this there was most probably a species of dome, whose acroterium is said to have been a metal pine-cone, which was the receptacle of the ashes of the emperor. The mausoleum of Augustus was inferior in size, in splendour and in good taste, we may believe, from the descriptions which exist of it when in a more perfect state than it is at present, to that of Adrian, but it was nevertheless a magnificent monument. Its form was conical; it diminished in storeys and terraces, probably columned round, and terminated at the apex in a bronze figure of its founder. The sepulchral monuments of Cecilia Metella, of the Plautian family and others, are evidences of the same fact. The sarcophagus from the first-mentioned of these is simple and elegant in the extreme, and indeed it exhibits a greater degree of good taste than almost anything of the same kind that remains to us of the ancients.

The Second Cathedral at Salisbury.

Winchester was the original see among the West Saxons; this was divided and subdivided, and Wiltshire is believed to have been included in the diocese of Sherbourne for some two centuries, when, in pursuance of Alfred's intentions for restoring order in ecclesiastical affairs, a synod was held under Edward the Elder, and the two bishoprics of Dorchester, in Oxfordshire, and Sherbourne were divided into five. One of these was for Wiltshire; the seat of the bishop was unsettled, and is said to have been alternately at Wilton, Sunning and Ramsbury, near Marlborough. Herman de Lotharingia would have removed the episcopal seat from Wilton to Malmesbury. Edward the Confessor consented, but the monks of Malmesbury were not disposed to be under any episcopal governance. Herman retired to St. Omers, assumed a monk's habit, and when he returned to England he was instrumental in two great changes, viz. the union of his diocese with that of Sherbourne, and the removal of the combined sees to Sarum. At Sarum he began a cathedral which was completed by his successor, Osmund, who had accompanied William the Conqueror in his invasion, and held the high office of Chancellor. After Osmund came Bishop Roger, whose fortunes were as tragic as Wolsey's. Among other works of the same kind he rebuilt the church at Sarum, which had been injured by storms and fire, and beautified it so greatly that it yielded to none in England at that time. The third in succession to Roger was Herbert Poore, and in his episcopacy it was determined to remove the cathedral from the hill at Old Sarum to a site in the valley two miles distant. The motives for this removal are specified in the bull whereby it was authorised. It was alleged, the Pope said, "That forasmuch as your church is built within the compass of the fortifications of Sarum, it is subject to so many inconveniences and oppressions that you cannot reside in the same without great corporal peril, for being situated on a lofty place it is, as it were, continually shaken by the collision of the winds, so that whilst you are celebrating the divine offices you cannot hear one another, the place itself is so noisy, and besides, the persons resident there suffer such perpetual oppressions that they are hardly able to keep in repair the roof of the church, which is constantly torn by tempestuous winds; they are also forced to buy water at as great a price as would be sufficient to purchase the common drink of the country, nor is there any access open to the same without the license of the castellan. So that it happens that on Ash Wednesday, when

the Lord's Supper is administered, at the time of synods and celebration of Orders, and on other solemn days, the faithful being willing to visit the said church, entrance is denied them by the keepers of the castle saying that thereby the fortress is in danger. Besides, you have not there houses sufficient for you, whereby you are forced to rent several of the laity, and that on account of these and other inconveniences many absent themselves from the service of the said church." These inconveniences having been sufficiently proved, Pope Honorius authorised them to remove the church to a more convenient place, "but saving to every person, as well secular as ecclesiastical, his rights, and the privileges, dignities, and all the liberties of the said church to remain in their state and force." A piece of ground, called Merrifield, having been chosen for the site, the first business was to erect and consecrate a wooden chapel for temporary use, and then to consecrate a cemetery adjoining. The primate, the young King Henry III. and all the other chief persons of the realm were invited to attend when the foundation should be laid, as at an event which was not unfitly deemed to be of national importance. The bishop, after consecrating the ground, laid the first stone in the name of the Pope, the second in that of the Archbishop of Canterbury, the third for himself, the fourth was laid by William Longspee, Earl of Sarum, the fifth by Ela de Vitri, his wife. Then the nobles who were present laid each a stone, and after them the dean, the chanter, the chancellor, the treasurer and the archdeacon and canons of the church of Sarum in their turn, "the people weeping for joy and contributing thereto their alms with a ready mind, according to the ability which God had given them." Several nobles on their return from Wales (where the king was then concluding a treaty with Llewellyn ap Iorwerth) repaired to Sarum to partake in the merit of the work which was going on, and laying each a stone, bound themselves to some special contribution for seven years.

Raphael and Da Vinci.

What would have been the effect on Raphael's mind and style of painting had he remained a longer time under the influence of Leonardo is not an uninteresting question. Nay, we may carry it back to his early training and ask, "What would Raphael have been had he been brought up in the school of L. da Vinci instead of that of Pietro Perugino?" Let us transport ourselves to the great room of the Louvre, where we have specimens of Raphael's early Florentine or Peruginesque manner; of his later Florentine and of his Roman manner; and where we have also two noble specimens of Leonardo's easel pictures. Now if we take the quality of expression—meaning thereby the thought and sentiment conveyed by the human countenance, and, in a less degree, by the attitude—Raphael's pictures stand the comparison with Leonardo's very differently. The earlier ones—the *St. George* and the picture called *La Belle Jardinière* are thrown somewhat in the shade; but there is a chivalrous determination in the attitude of the warrior saint that shows thought and purpose in the artist; and the exquisite purity of the Virgin's expression, the charm of her oval face and the downcast eyes are things *sui generis*—very delightful to the feelings if not suggestive of deep thought. But the great *Holy Family* and the *Saint Michael* are positively killed by Leonardo's proximity. They may have possessed a more spiritual character when Francis I. first received them, but as they are now seen they wax pale as regards the quality of expression before the *Santa Anna* and the portrait of *Mona Lisa*. The comparison of Leonardo's (or his pupil's) *La Vierge aux Rochers* with Raphael's *Ste Marguerite* is equally unfavourable to Raphael's pretensions to the character of a thoughtful painter. It may of course be said that Raphael's fame does not rest on his oil-pictures but on his frescoes and his cartoons for the tapestries. Neither does Leonardo's rest on his easel pictures, but on his cartoon of the *Battle of Anghiari* and his *Last Supper*. Putting these facts together and speculating thereon, it does appear more than probable that Raphael, had he studied under L. da Vinci instead of Pietro Perugino, would have learned to portray qualities of mind which only now and then find in him a ready and congenial exponent. And he would doubtless have acquired a greater insight into the structure of the human frame and more unerring accuracy in drawing the extremities. It will perhaps strike the reader that the comparison of Leonardo's serious pictures with Raphael's later works, in which he did not aim at representing intensity of thought and sentiment is unfair. Doubtless there is more similarity between Raphael's *Sposalizio* and his *Madonna del Granduca* and Leonardo's *Vierge aux Rochers* and *Santa Anna* than between any of Raphael's Louvre pictures and Leonardo's. It may be said further that where there is no identity of aim between two painters there can be no comparison between their works. Granted, but let us compare their respective aims. If we find one painter aiming at the representation of deep thought and sentiment and the other at that of a greater variety of emotion; the one choosing types of countenance and attitudes which harmonise

with a profound, tranquil, meditative spirit, and the other delighting in the various expressions which mark the differences of age and sex, and the easy and delicate play of graceful lines, which diffuses a joyous cheerfulness over the picture, we are surely at liberty to say which we prefer and which aim we think the nobler. Moreover, when the latter painter has changed his aim—when we find that at an earlier period he placed before his mind a different object as attainable by his art, we may surely compare the purpose of his youth with that of his later years; and if the latter appear to us less noble we may express a feeling of regret that he had not the inducement to persevere in his early motives which the example of Leonardo would have given him.

English Domestic Architecture.

In this country, which is still rich in the possession of numerous specimens of buildings, both ecclesiastical and domestic, belonging to the earlier ages of its history, the old English style, in some of its varieties, is that which is specially appropriate to an English country residence. The village church always, often the parsonage, and usually the neighbouring farmhouses and cottages, partake, in their several degrees, of this character, and assist in determining its choice. The natural scenery around presents congenial images in the venerable grove with its patriarchal rookery, and the ancient oaks spreading their broad arms over the lawns and glades of the feudal park. The local annals of the estate, of the site itself, or of the proprietor's family, combine to call for the employment of a style which is connected with so many of the most pleasing recollections of our national history. The irregularity of outline which it admits, and indeed almost requires, allows of any arrangement of the apartments which comfort or fancy may suggest, and accommodates it to all the varied wants of modern life. Moreover, it is equally appropriate to every rank of habitation, from the princely palace down to the snug parsonage or humbler cottage. And its intrinsic beauty and picturesqueness are thus increased and set off by the valuable qualities of harmony with the neighbouring buildings, fitness for all its possible purposes, and historical and local association. In all these points it infinitely excels the Classical styles. The symmetry and regularity of these interfere with the convenient disposition of modern apartments; their porticoes and colonnades shut out the light, unless made so shallow as to destroy the intended effect; nor does their outline harmonise with the general character of the rural scenery of this country, any more than their plan with its climate, or the ideas they recall with its history. The Grecian temple appears as completely out of place in an English landscape as would a cloistered abbey or feudal castle in the prairies of Kentucky or Illinois.

Roman and Pompeian Houses.

If evidence were required to prove the futility of written descriptions of buildings when their general model is unknown, it would be enough to compare the house of a Roman gentleman in Pompeii with the various designs which have been made of the same thing from the descriptions and directions of Vitruvius, before the exhumation of that city. Their authors could only work upon the notion they had of laying out houses; and therefore the plans produced are those of ill-contrived modern residences, so arranged that they may present a uniform and architectural external elevation, which the Roman houses have not; with windows properly lighting every apartment, which are totally wanting in the latter; with staircases to upper storeys that did not exist; with corridors and doors uniformly disposed, which was unheeded in laying out a Roman house. The Vitruvian restorers put columns wherever they could, whereas the Roman architects appear only to have put them where they could not avoid it. In dimensions, too, the former erred no less than in distribution; they thought none too extensive for a Roman domicile; but the apartments in Roman houses, wherever they are, are generally small, and in ordinary cases their whole site is exceedingly restricted. In proportioning the various parts, they adhered to rules the Romans never heeded, and applied the details of the architecture of temples and triumphal arches to domestic edifices, in whose composition the plasterer, painter and mason almost appear to have been the only architects. Far inferior as Pompeii was to Rome in magnitude and splendour, there is no more reason for supposing that houses in the latter were so very differently arranged from those in the former, that the same general description of them should not apply to both, than there would be for a future antiquary to hesitate in applying the plan of a Brighton or Bath house which may be preserved to a London mansion, for we know that in ordinary cases they nearly coincide. It is, too, a recorded fact that wealthy Roman citizens had mansions at Pompeii and Herculaneum, and discoveries made of ordinary houses under the present level of Rome show them to be exactly like the more perfect ones of the Campanian city, except in their state of preservation; so that, *parvis componere magna*, in Pompeii we may see the domestic as well as public architecture of ancient Rome.

NOTES AND COMMENTS.

AN interesting valuation case came before Mr. Justice MATHEW and Mr. Justice KENNEDY on Monday. In Oxford the valuations of the University buildings used to be assessed by a committee, partly composed of heads of houses and resident members of the University. In 1890 an Act was obtained by the Corporation by which they were empowered "to levy, collect and recover, as well as to make and assess, all municipal rates." One of its effects was an increase in the valuation of various University buildings. The Bodleian Library, Divinity School, &c., which were formerly valued at 1,000*l.*, were put down at the rateable value of 1,840*l.*; the Clarendon Press was increased from 1,196*l.* to 2,160*l.*; the University Museum, from 800*l.* to 1,120*l.*; the Clarendon Buildings, from 336*l.* to 360*l.*; the Ashmolean Museum, from 200*l.* to 224*l.*, and so on. The Council in October last made a district rate which was based on the new valuation. The University authorities declined to pay, on the ground that the assessments should have been based on the Poor Law valuation lists as formerly, and therefore the rate was bad. It was held by Mr. Justice MATHEW that the Legislature could not have contemplated the assessment of buildings at different sums in different valuations. The Corporation of Oxford had been made an independent tribunal for the purpose of treating all the rates according to a uniform standard, and therefore the new assessment and rate were valid. Mr. Justice KENNEDY concurred in that opinion. Another anomaly has been therefore removed in Oxford.

It would appear that the external surface of concrete walls will be affected by the character of the timber employed for the temporary framing. In some military works by the United States engineers the plan originally followed was to build all the concrete work with frames of undressed spruce lumber, and then, on removal of the frames, to plaster the exposed face with cement. This coat of plaster could not be made to adhere to the older work, which rapidly absorbed its moisture, weakening the bond between the two, which was destroyed by the first cold weather, when the coating cracked and dropped off, much to the detriment of the appearance of the work. There was, besides, no economy in the use of spruce lumber, which warped out of shape when subjected to the moisture of the concrete, and could seldom be used more than once, and the plastering was very expensive. It was therefore decided to substitute framing made of first quality dressed white pine, grooved on both edges, and united by loose tongues of yellow pine, and to construct the masonry differently. That portion of the concrete next to the frame, 4 inches thick, was laid, and on the frames being removed, a rubbing with a float was sufficient to give a smooth surface to the face. The work was found to resist changes of temperature without scaling or cracking.

THE Coventry City Council have adopted the following resolutions:—"That competitive designs be invited from architects practising in Coventry, and from a limited number of others to be selected by the committee from architects who have expressed their willingness to compete on the terms now proposed." "That a premium of 150*l.* be offered for the best design, and 50*l.* each for the designs placed second and third in order of merit, the adjudication being in the hands of an independent assessor. That the plans and design placed first in order of merit, and in respect of which the premium of 150*l.* is paid, remain the property of the Corporation, and be retained by them, all others being returned, carriage paid, to their respective authors." "That competitors be informed that as the Council is uncertain, when, if ever, complete municipal buildings will be erected, they are unable to agree at present to employ the author of the design placed first to carry it out; but that they do propose, if no insuperable objection exists, to employ him to carry out such portion of it as can at once, or from time to time, be undertaken, on the usual professional terms, such portions to be so arranged as to be part of the entire design, and consistent with its future complete realisation. That they also agree to pay

the author of such design (or his representatives) one and a quarter per cent. on the estimated cost of the unexecuted portion of his design, if within seven years from the choice of the same no instructions are given for the completion of the buildings, having due regard to any portions which may then have been executed by the architect." Mr. CHARLES BARRY has agreed to become assessor, his fee being 100 guineas, and 10 guineas each for any preliminary conferences, with travelling and hotel expenses.

TOURISTS who are eager to behold Malmaison, in which the first NAPOLEON enjoyed a few years of happiness, should lose no time in visiting the retreat. According to Mr. DANVERS POWER, who has just visited the place, the whole estate has been sold, and is now largely cut up into building plots, but the château itself remains, with part of the park and the site of the old gardens. Malmaison presents a deplorable appearance, the floors, roofs, and woodwork being in a state of decay which would render restoration a work of great expense, even if anyone could be found who required a castle surrounded by a building estate. But the rooms, though absolutely dismantled, still bear traces of their old uses, and are easily distinguishable. The library, dining-room, drawing-room, and the Empress's bedroom in which she died may be mentioned. Malmaison is near Rueil, which is within twenty minutes' railway journey from Paris.

THE latest excavations at Jerusalem undertaken by the Palestine Exploration Fund are proceeding with a success that is encouraging. The site lies to the south of the city, outside the walls, close to the English cemetery. Traces of the ancient wall are sought, and there are already indications that this hope will not be disappointed. Mr. BLISS, the representative of the Fund, reports that having sunk a shaft at a point a little south-east of the cemetery and driven a tunnel from it in a north-easterly direction, he came at a distance of 48 feet "upon a finely-worked rock-scarp." This was traced, following its various angles and working both to the right and the left, for about 140 feet, and is thought by Mr. BLISS to mark "the veritable exterior line of fortifications of ancient Jerusalem." Whether this supposition is correct remains to be ascertained. One of the inhabitants in digging the foundations of a house to the north of the city, not far from the church of St. Stephens, has discovered a very beautiful mosaic pavement. Mr. BLISS describes it as "a splendid piece of work, measuring about 21 feet by 13 feet. . . . Within a beautiful border . . . is a vine with branches on which hang clusters of grapes, and among the branches are numerous birds—peacocks, ducks, storks, an eagle, a partridge, a parrot in a cage, &c. It is almost perfectly preserved, and near the eastern end is an Armenian inscription to the effect that the place was in memory of all those Armenians whose names the LORD knows." Underneath is a cavern in which were found bones, lamps and glass vases. Photographs of the mosaic can be seen at the office of the Fund in Hanover Square.

ON the 11th and 12th of the present month the old Roman theatre at Orange will be utilised for representations of the two tragedies "Cedipe" and "Antigone" by members of the Comédie Française. For some time past a restoration has been in progress under the direction of M. FORMIGÉ, the architect, and the seats have been reconstructed up to the first platform. As the profits of the performances will be devoted to the work, it is expected that before long the whole of the building will be restored. The theatre was intended to accommodate about 12,000 spectators, and it is remarkable that in its existing state the acoustic properties are remarkable, and words spoken in the proscenium can be heard in the most remote parts of the ruins. The site selected is at the foot of a hill. The plan is semicircular, the stage and its dependencies forming a sort of rectangular chord. At one time the theatre was adorned in a magnificent style, but the marble columns, statues, reliefs and other decoration can only be imagined by the aid of a few fragments.



"WHEATFIELD LODGE," H
T. BUTLE

3rd 1894.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

YORKS: THE DINING ROOM

A., Architect.

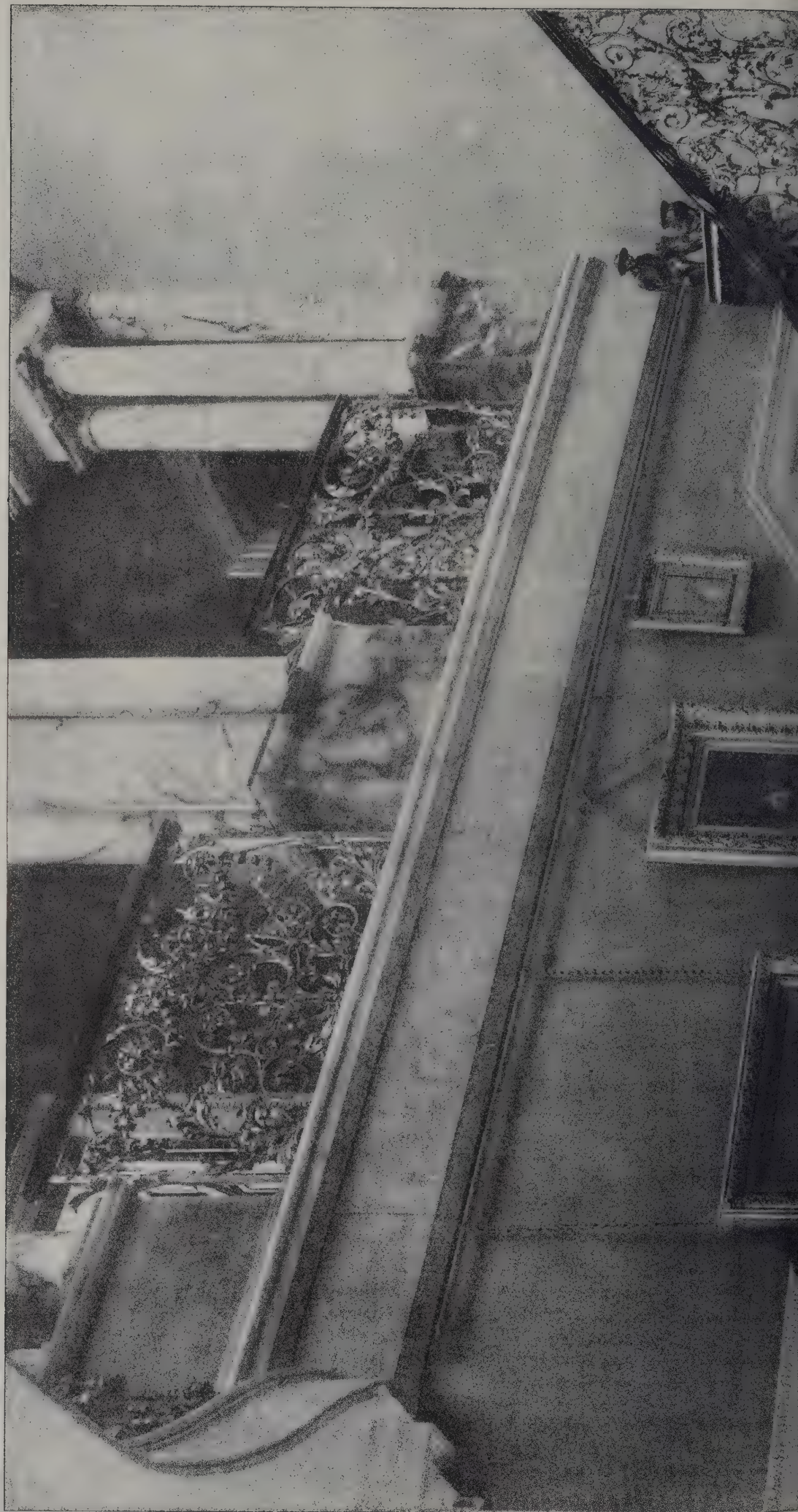


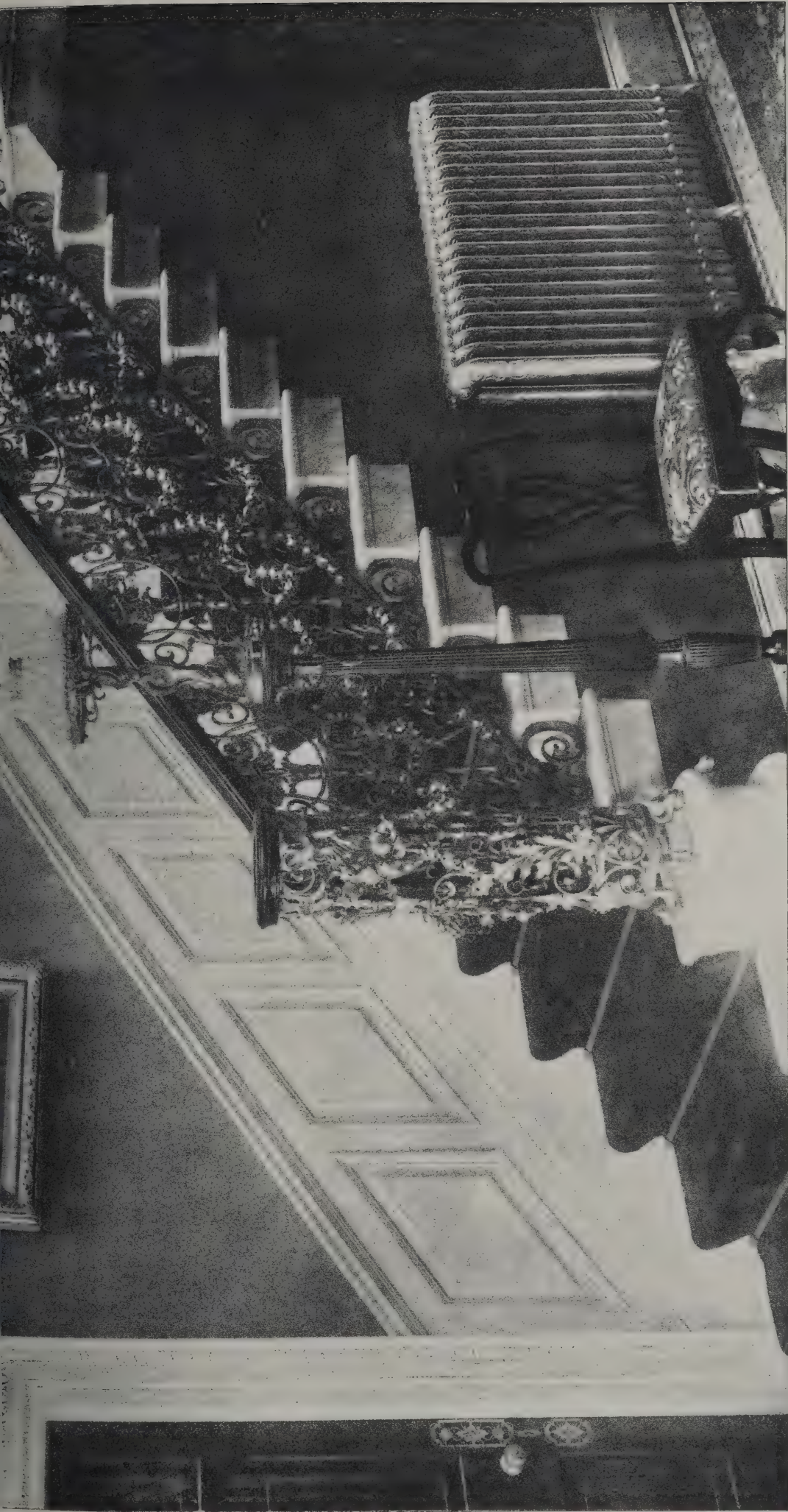
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WATERHEAD BATHS. OLDHAM



The Architect, Aug: 3rd 1894.





INK PHOTO SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"WHEATFIELD LODGE," HEADINGLEY, YORKS: THE STAIRCASE.
T. BUTLER WILSON, F.R.I.B.A., Architect.

ILLUSTRATIONS.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE DINING-ROOM.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE STAIRCASE.

LONGHOUSE FARM.

THIS farmhouse, which is for a dairy-farm on the Orchardleigh estate, is now in course of erection. The cheese will be stored in a room over the dairy. The builder is Mr. J. VALLIS, of Frome, and the architect, Mr. B. VAUGHAN JOHNSON, M.A., of Westminster.

WATERHEAD BATHS, OLDHAM.

THE building is situated on the corner of a plot of land abutting on Cedar Street on the front and Mortar Street on the side. The superintendent's house is placed at the angle of the two streets, and having lobby, sitting-room, kitchen and scullery on ground floor, three bedrooms, also cellar. In the centre of the block is ticket-office, well lighted with a large elliptic-headed bay window. This room is well fitted up with drawers and cupboards for storage of towels, &c.

On each side of this room are the male and female entrance corridors, fitted with swing doors, having upper panels glazed with lead lights, and separated from ticket-office by glazed screens, with bay window and registering turnstiles to each, a gate being provided to turnstiles for use of officials, &c.

Behind here there is a cross corridor, which leads on the left to twelve male slipper-baths, and on the right to six female slipper-baths, there being a separate waiting-room for each sex.

The whole of the slipper-baths are porcelain, glazed both inside and outside, having no wood framing round whatever. This system is the most sanitary arrangement, as it allows the attendant to have thorough supervision, so that it would be impossible for the slightest dirt to accumulate without his knowledge. Five of the slipper-baths are used as first-class, having showers and other advantages over the remainder. The supply of hot and cold water to the baths is regulated by means of valves worked by a detachable handle by attendant from the corridor. From the cross corridor the plunge-bath is reached, the dimensions of this room being 74 feet by 46 feet, with a water area of 60 feet by 26 feet, the depth being 6 feet 6 inches at one end and 3 feet 6 inches at the other; the bottom is tiled with black and white tiles formed in panels, the sides being faced with white glazed bricks. A diving platform is provided at the deep end of bath. Round the gangways are ranged forty-two dressing-boxes, there also being the necessary foot-baths, shower, water-closets, urinals, &c. Six Stott-Thorpe pendants with ornamental wrought-iron scrolls are provided. The entrances to this bath are so arranged that it can be used by either sex without interfering with private-bath corridors. At the rear of the premises are the laundry and boiler-house, the former being fitted up with all modern requisites, consisting of patent steam-power washing machine, also rinsing-tank, with wringer having rollers of vulcanised indiarubber, wringing and mangling machine, drying chamber containing six drying horses, four washing troughs, all fed with steam, hot and cold supply, the whole of machinery being worked by steam-power by means of a vertical steam-engine and shafting driven with belting.

A two-flued boiler, 15 feet by 6 feet 6 inches, made by the Oldham Boiler Works Company, supplies steam for the system throughout. The floors to the whole of baths and corridors are of steel joists, and finished with granite-faced concrete, being plentifully supplied with channels and grids to convey away surplus water. The baths and corridors have dados of white glazed bricks with ornamental bands at top. The whole of premises are efficiently heated by steam. The continuous lantern lights both over plunge and private baths are made to open from end to end for ventilation by means of cranked levers, &c., worked by attendant from the floor. The whole of the building work has been carried out by Mr. WILLIAM LÉES, the sub-contractors being:—Excavating and drainage, Mr. JAMES BRIERLEY; brickwork and concreting, Messrs. S. & J. SMETHURST; masonry, Mr. T. BEBBINGTON; steel joists, &c., Mr. EDWARD WOOD, Man-

chester; wrought-ironwork, Mr. J. KERSHAW; slating, Mr. JOSEPH JACKSON; plumbing, glazing and painting, Messrs. HARKER BROS.; plastering, Mr. DAVID ROTHWELL.

The whole of the steam, hydraulic and engineering arrangements throughout have been carried out by Mr. W. F. SPENCER, Crossbank Works, Oldham, the whole having been executed according to the plans and under the supervision of Mr. CHARLES T. TAYLOR, A.R.I.B.A., architect, 10 Clegg Street, Oldham, whose design was placed first in competition by the professional assessor.

ST. PETER'S CHURCH, STAINES.

THE new church of St. Peter's, Staines, was consecrated by the Bishop of Marlborough on Saturday, July 28. It is, we believe, the first church which has ever been erected in this country by a lawyer who has filled the high office of Solicitor-General.

In the light of this fact a few remarks concerning the church will be read with general interest.

The work was placed in the hands of Mr. George H. Fellowes Prynne, F.R.I.B.A., of 6 Queen Anne's Gate, Westminster, early in 1892. After some unforeseen delay the tender of Messrs. Goddard & Sons, of Farnham, for 6,000*l.* was accepted, this sum being exclusive of the tower and spire, which have since been given by Sir Edward Clarke at an additional cost of about 1,400*l.* The screen has also since been given at a cost of nearly 300*l.* The style chosen in design is a free treatment of Perpendicular in red brick and stone.

The nave is of four bays 26 feet wide by 80 feet in length, having a height of 40 feet to the apex of the waggon roof. The chancel is of the same width and height as the nave. Aisles are thrown out on the north and south sides of the nave. There is a narthex at the west end with western entrance. The tower, which is placed at the south-west end of the south aisle, is designed in three stages and capped with a copper-covered spire. In the lower stage on the nave floor level a baptistery is formed.

In the upper stages, which are ornamented externally with panelled work in brick and stone, are arranged the belfry and bell-ringers' floor.

A southern transept with separate entrance forms the nave of a small chapel on the south side of the chancel. On the north side of the chancel are clergy and choir vestries with the organ chamber. The altar is elevated by nine steps from the nave floor level, and ample space and height are left above and behind the altar for a baldachino or reredos. One of the main features of the church is the constructional rood-screen, which is carried right up the chancel arch, the upper portion of which is enriched with tracery. The central figure and rood are designed to be cut out of the solid stonework of the tracery, and the side figures placed on corbels formed in the panels of the tracery. This feature is quite unique, no other example of similar treatment existing. All the sculptured work has been done by Mr. J. Taylerson, of Lavender Hill.

Throughout the work has been well and thoroughly executed by the builders, Mr. W. H. Augur, of Staines, acting as clerk of works. The furniture of the church is of an appropriate and ornate character. Choir stalls have been presented by Sir Edward; and the altar, which is of very elaborate design, and which is to be highly decorated in gold and colours from the architect's design, is a gift of Lady Clarke.

Both the stalls and altar have been carried out from the architect's designs by Messrs. Lonnie & Co., of Camberwell. The iron screen-work and chancel gates and door furniture have been made by Messrs. Singer & Sons, of Frome.

The rich dossal and hangings were supplied by Mr. Alfred Stalman, of Frith Street, Soho. Mr. Puckle, the churchwarden, presented a window in the south aisle, and a pair of old Norwegian candlesticks were given by a legal friend.

Messrs. John Warner & Sons, Limited, supplied the tenor bell in E, weighing 15 cwt.

THE MANCHESTER SOCIETY OF ARCHITECTS.

A VALUABLE addition to the architectural works in the library of this Society has just been placed on the shelves at 36 George Street, namely, thirty-five volumes presented by Mrs. Whitaker, the widow and executrix of the late Mr. William Wilkinson Whitaker, architect, of Cornbrook House, Manchester. The folio volumes include several works by Sir M. Digby Wyatt, "The Ecclesiastical Architecture of Italy" by Henry Gully Knight, "Henry VII. Chapel, Westminster," by Cottingham, and "St. Stephen's Chapel" by Mackenzie, and other valuable works.

Mrs. Whitaker also supplemented her gift by a liberal donation in money for the purchase of other books.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

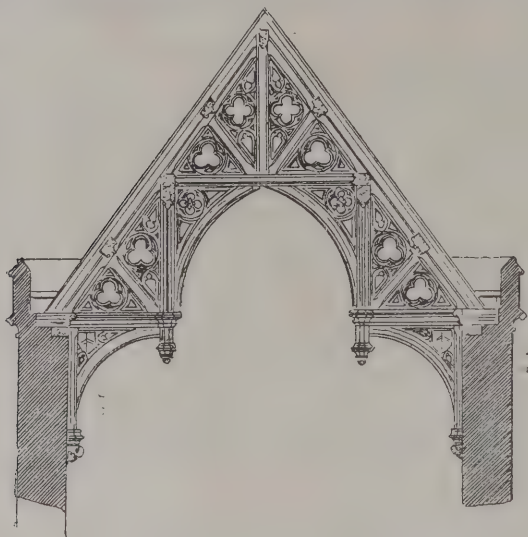
(Continued from page 60.)

LECTURE II.

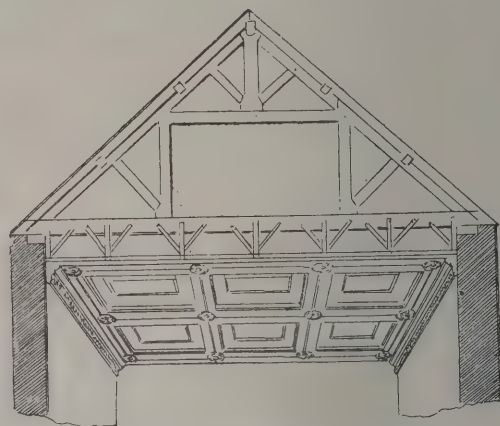
WE will now proceed to consider decoration with regard to constructions in wood, which are founded on quite opposite principles to those of stone. With timber you may attain a great height or extend over a great breadth, by means of a single spar reared on its base or supported at the ends. The strength of woodwork is attained by bracing the various pieces together on geometrical principles. This is beautifully exemplified in ancient roofs either of churches or domestic build-

The stupendous roof of Westminster Hall, decidedly the grandest in the world, illustrates this principle fully, and so do all the roofs in the collegiate halls of Oxford and Cambridge, as well as those of the palatial edifices at Eltham, Hampton Court, Croydon, and many others belonging to manorial residences.

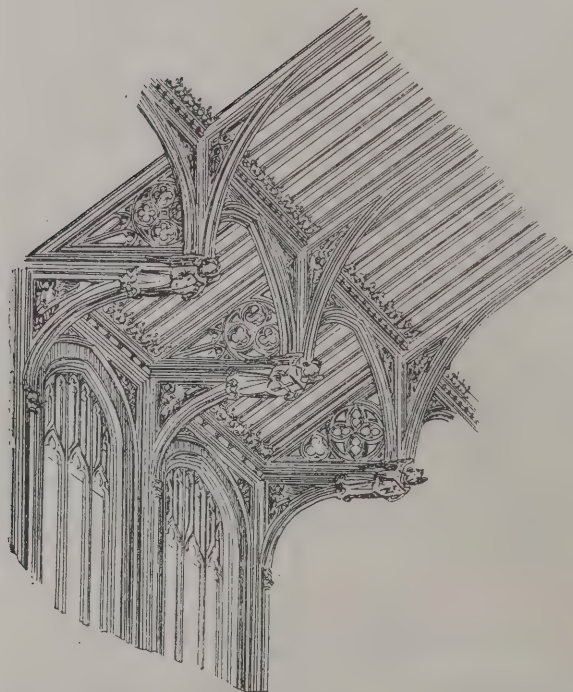
Of wooden roofs over churches we have beautiful specimens in various parts of England, but especially in Lincolnshire, Norfolk and Suffolk. The beams of these roofs are beautifully moulded and enriched with carvings (figs. 3, 4).



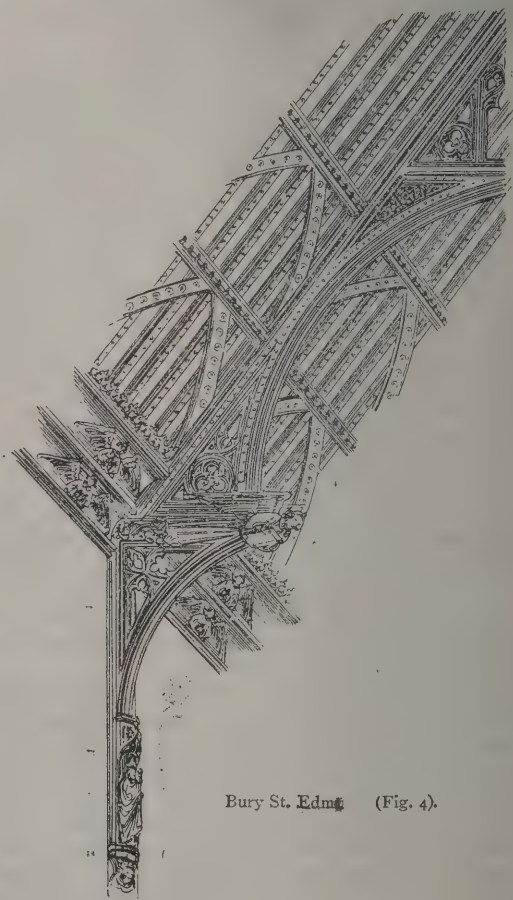
Ancient Roof with the Framing made Ornamental (Fig. 1).



Modern Roof with the Framing concealed by a Plastered Ceil



Blakeney Church, Norfolk (Fig. 3).



Bury St. Edmunds (Fig. 4).

ings; the construction of these, so far from being concealed, is turned into ornament. The principal tie-beams, rafters, purlins and braces, which in modern edifices are hidden at a vast expense by a flat plaster ceiling, are here rendered very ornamental features, and this essential portion of a building becomes its greatest beauty (figs. 1 and 2).

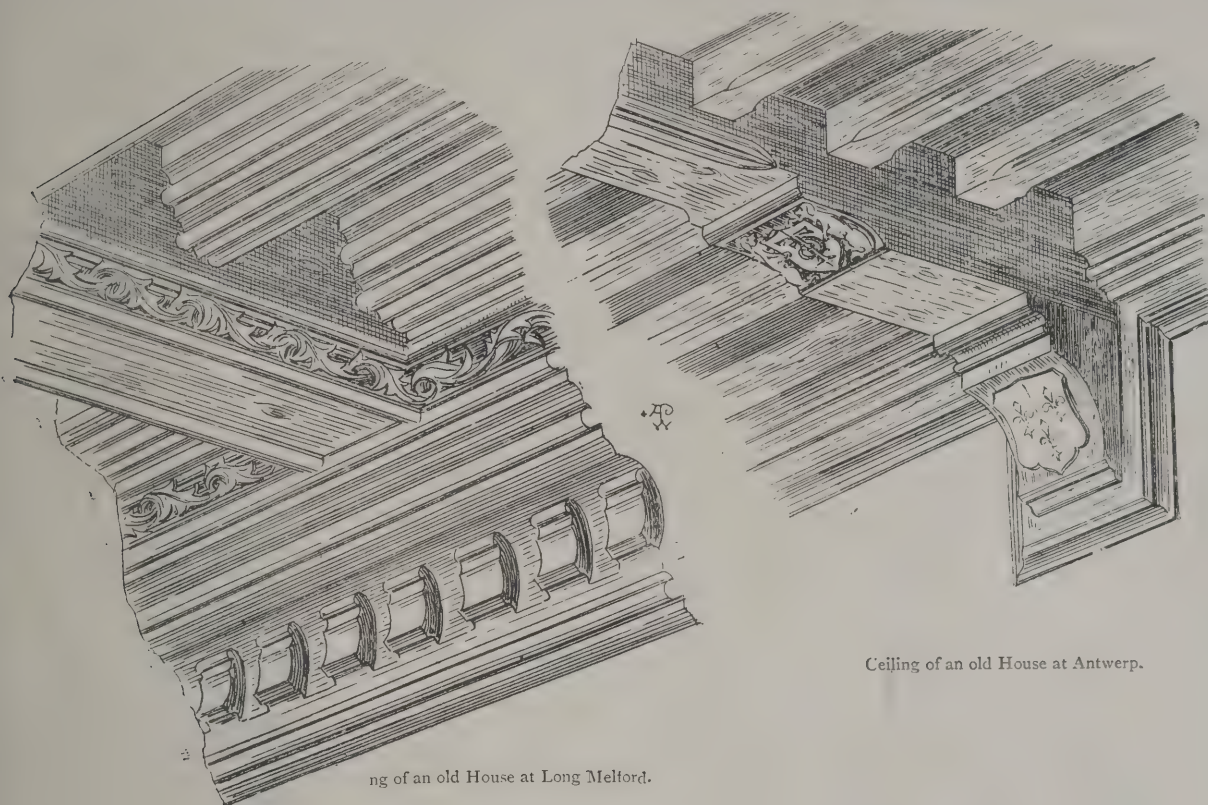
Nor were these carvings without a mystical and appropriate meaning; they usually represented angels, archangels and various orders of the heavenly hierarchy, hovering over the congregated faithful, while the spaces between the rafters were painted azure and powdered with stars and other celestial emblems, a beautiful figure of the firmament. Some of these

angels held shields charged with the instruments of the Passion, the holy name and other emblems; others labels with devout scriptures. Every portion of these roofs was enriched with painting, and when in their glory must have formed splendid canopies to the temples of the living God; and what is peculiarly useful to illustrate my present purpose, these roofs were of an entirely different construction to coverings of stone. Wooden groining is decidedly bad, because it is employing a material in the place and after the manner of stone, which requires an entirely different mode of construction.

I am aware that ancient examples of wooden groining are to be found in the cloisters of Lincoln Cathedral, Selby

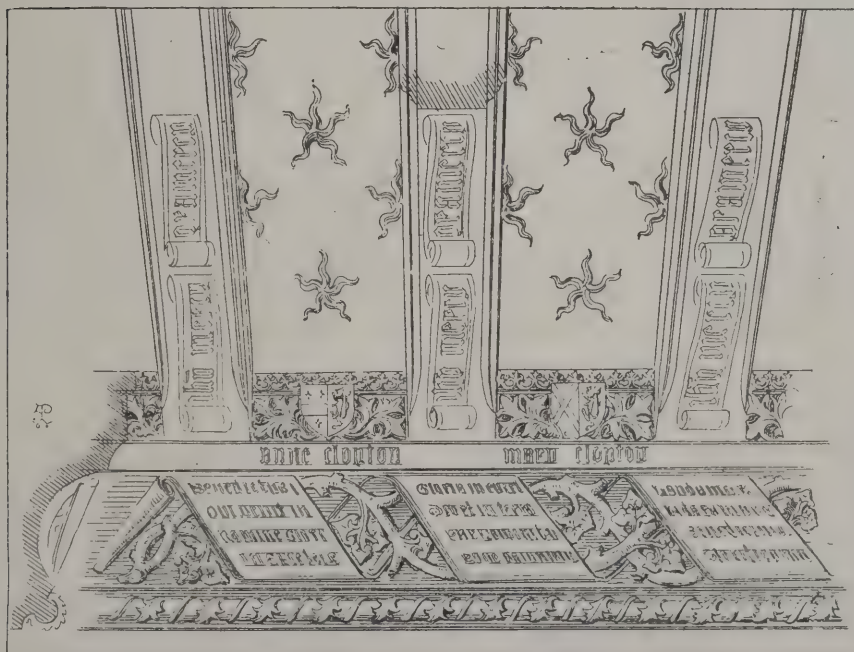
made an entirely different arrangement in their upper parts, suitable to an ornamental wooden roof.

At Bury St. Edmunds is a glorious roof, of which I have given a sketch. At every pair of principals are two angels as large as the human figure, bearing the sacred vessels and ornaments used in the celebration of the holy sacrifice; these angels are vested in chasubles and dalmatics, tunics and copes, of ancient and beautiful form; the candlesticks, thurible, chalice, books, cruets, &c., which they bear are most valuable authorities for the form and design of those used in our ancient churches. The roofs of St. Peter's and All Saints, in that truly catholic city of Norwich, are very fine; and in



ng of an old House at Long Melford.

Ceiling of an old House at Antwerp.



Ceiling, Clopton Chantry, Long Melford.

Church and some others; but in these cases, as well as any others in which it may be found, an inspection of the building will clearly show that they were originally intended to have been groined with stone, and that the springing ribs have been carried up some height in that material, but that owing to a real or supposed weakness in the side walls, which were not considered capable of resisting the lateral pressure of stone vaulting, the expedient of an imitation groining in wood was resorted to as a case of absolute necessity; and I am decidedly of opinion that had not the original intention been to have groined these churches in stone, their builders would have

Lavenham and Long Melford churches, in Suffolk, [are admirable specimens of carved timber roofs.*

But, alas! how many equally fine roofs have been demolished and burnt by the brutal ignorance of parish functionaries!—how many have been daubed over by the remorseless whitewasher!—how many painted in vile imitation of marble, as at Yarmouth (especially if the churchwarden for the time being happened to be a grainer!)—how many of these

* In the last number of the *British Critic* is a most admirable article on open roofs, well worthy the perusal of all who are interested in the revival of ancient ecclesiastical architecture.

fine roofs have been spoiled of their beautiful and appropriate decorations by the execrable fanaticism of the Puritan faction, who actually have made entries in the parish accounts of the cost of their demolition!—how many concealed from view by lath and plaster ceilings of miserable design tacked up under them!—and although a somewhat better spirit has at length arisen, still how many of these beautiful memorials of the piety and skill of our ancestors are yet being mutilated or utterly destroyed under the pretext of reparation!—a plea which is not unfrequently urged by those in authority for selling the lead and massive oak beams, the solid covering of antiquity, and substituting a plastered ceiling and meagre slates in their stead which detestable practice is still in full force in many parts of England.

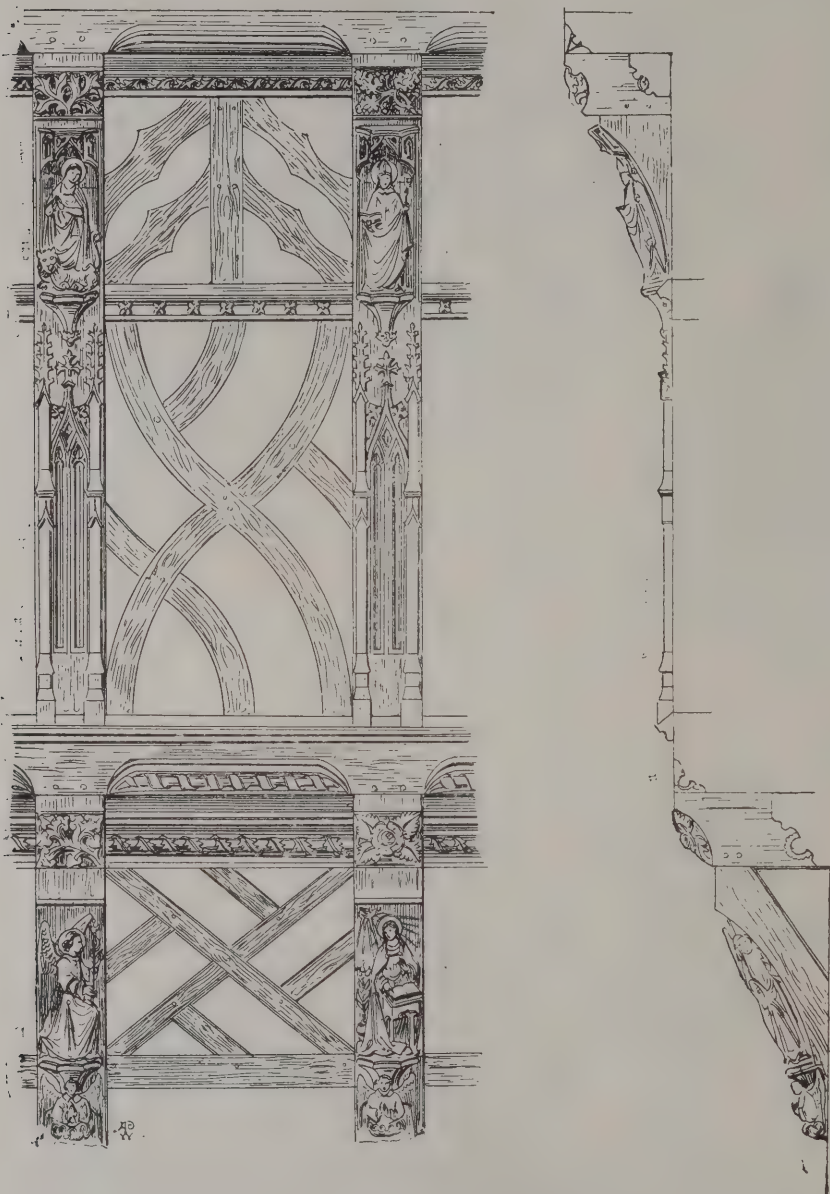
rapidly disappearing to make way for monotonous plaster buildings, which are constructed also of wood; but as modern architects have not the skill to ornament that construction, the whole of the timbers are concealed by mock cornices and pilasters, so that the houses of modern Rouen have all the disadvantages of the old wooden buildings, without one particle of their beauty.

As gable-ends form most prominent features of the old buildings, and as they are continually attempted by modern Gothic builders, I will draw your attention to their real use, and then point out some of the egregious blunders frequently committed by modern architects when they attempt to introduce them.

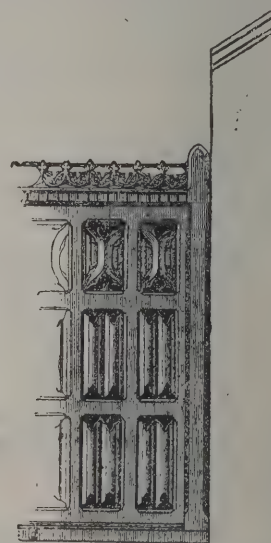
The barge-boards of gables are intended to cover and preserve the ends of the purlins which projected over to shelter the front of the building.

The hip knop which terminated the ancient gables was in reality a king post fixed at the junction of the barge-boards, and into which they were tenanted. To the upper part of these was usually affixed a vane, and the bottom was finished off in the form of a pendant.

In modern gable ends the barge-boards are generally so slight and cut so open that they become mere skeletons, and utterly useless for the purpose for which they should be fixed, that



Example of Ornamented Construction in an Ancient Timber House.



of covering the timber ends. Again, the knop really useful at the apex of the gable is repeated in modern gables at the extremities, hanging down to an extravagant depth, and loaded with bunched finials and pendants.

Of these we may say with Puff in "The Critic," when he hears the three morning guns, "Give these fellows a good idea and they will work it to death." A king post in the centre of the gable is good, because it is really useful, but at the lower extremities these excrescences cannot serve any purpose except to add useless weight and unnecessary expense.

(To be continued.)

Not only do we find the construction of roofs ornamented, but there are numerous examples of common joist floors and the carrying beams which are rendered exceedingly beautiful by moulding and carving.*

In the ancient timbered houses of which such interesting examples yet remain in many of our old cities, especially at Coventry, York and Gloucester, we do not find a single feature introduced beyond the decoration of what was necessary for their substantial construction. What can be stronger, and at the same time more ornamental, than the curvilinear bracing by which due advantage was taken of crooked pieces of timber? The ancient French cities, Rouen, Beauvais, Abbeville, Liseux and others were full of timber houses covered with carved beams and most varied ornaments; but these are

* The ground of the ceiling of the Clopton Chantry, Long Melford, is azure; the stars are of lead, gilt; the inscription on the rafters is "Ihu Mercy, and Gramercy;" the arms on the shields are those belonging to different branches of the Clopton family, with their names inscribed beneath. The scripture on the large scroll is extracted from the Psalter, the whole richly painted.

THE ROMAN WALL.

SOME important excavations have lately been commenced on the line of the Roman Wall in Cumberland, under the superintendence of Professor Pelham, Mr. Haverfield and other Oxford archaeologists, acting in conjunction with the local antiquarian society. The first object of the excavators has been to explore the Vallum and to trace the connection between it and the Wall, and sections have been made accordingly at various places between Carlisle and Castlesteads. At Brunstock Park, about three miles east of Carlisle, trenches were dug from the north side of the Wall to the south of the Vallum, this being the first time such complete trenches have ever been dug. The foundations of the wall were discovered, and close behind it the appearance of a paved footway. A few paces further south the diggers came upon the Roman road which (as we now know) ran close behind the Wall. The road was made with large stones in the centre and on the kerb, a clay basis, and a packing of freestone and clay, with gravel above. Further to the south lay the Vallum, with its ditch and three mounds, and immediately to the north of it a small ditch not unlike the Gräbchen which the German excavators have lately

found on the Limes. At Whittemoss, Bleatarn and Chapelfield (near Irthington) other sections have been dug, with curious results. At Bleatarn a quarry has been traced, out of which the Wall was possibly constructed. In August further sections will be made in the eastern part of Cumberland, near Lanercost, and digging has also begun in Northumberland.

THE PROGRESS OF ARCHÆOLOGY.*

I SHOULD forfeit your good opinion of me if I did not confess to feeling embarrassed by the position in which, by your favour, I find myself. The honour and distinction of filling a chair which has been occupied by so many better men than myself is qualified with every doubt and difficulty. When I look round this room I see before me not only those gifted with greater knowledge than I possess, but who have had greater opportunities and have not had the work which they love continually interfered with by manifold cares and duties. You will accept this as my apology for the disinterested and elementary remarks which I shall enforce upon you. In selecting a subject on which to address you, I have felt it would not be profitable or interesting to merely index the progress of archæology during the last twelve months, nor to condense the county history of Shropshire into a necessarily dry and compressed guide to local antiquities which you must know better than I can know. I have thought it more profitable to devote a little time to-day to considering some of the methods of archæological research, as they have been enlarged and developed in late years, and condense some of the more general conclusions that have been reached, and more especially to illustrate them from my own desultory studies.

The Archæological Institute has always been a most catholic mother. Her aim and object has been, as far as possible, to give a picture of the sometimes gay and sometimes gloomy procession which our race has formed as it has tramped along the avenues of Time, from the land of mist and cloud to the land of darkness. Every fact, however recorded, whether invoked in words or graven in the universal language in which the ruins of art are enshrined, has been welcome, and it has taught the lesson that history means something more than philosophy and teaching by examples; it means painting the picture of the past, and piecing together the broken bits which have escaped. It was once the custom to despise some of these lessons. The antiquary was a connoisseur, whose studies were dominated by taste and not by knowledge. To admire, to study, and to review the masterpieces of Greek art, to do the same with the masterpieces of the Italian Renaissance, these were his aims. Phidias and Michel Angelo were his ideals. It was only when the tide was flowing highest that it was deemed profitable to study it. Hence the collections and the museums gathered in former centuries are so wanting in historic value. They represent the phases of taste as applied to the acts of other days, and the various measures and standards which the change of taste has created, sometimes inspired by nature alone and sometimes by nature bewigged and powdered. We have advanced from this position. We have learnt that the ebb as well as the flow of the tide is of supreme interest to us, perhaps of even more interest. Hence, while we admire and rejoice in some masterpiece like the *Hermes* of Praxiteles, we are constrained to devote a corresponding study to the rude bas-reliefs from the temples of Copan, and the ruder and more homely products of the old stone men. We can scarcely realise that hardly a generation has gone by when, at the British Museum, it was the fashion to admit only Classical antiquities as worthy of collection, and that the priceless treasures dug up by Faussett and Rolfe were treated as rubbish unworthy of a place in that sanctuary of the arts, and had to seek a home in a provincial museum. Fifty years ago a man who had devoted his time, his purse, and his knowledge to creating a worthy department of British antiquities would not have been rewarded with the Order of the Bath, but would have been treated by the students of the so-called high art as a barbarian and a Philistine fit only to consort with people like you and I.

We have changed all this, but its mischievous results still remain. If we go to the British Museum we shall find the noblest collection of Greek art in the world. Taken altogether it is quite unapproachable, thanks to the labours, the zeal and the taste of many good men, and notably of the late and the present curators of that department. But when we turn to Rome—Rome, the mother of modern Europe—Rome, the Britain of old days—the great type of practical good sense in government, the Rome whose roads and bridges, whose colonies and towns, whose laws and municipal institutions were only rivalled by our own, and which ruled the world for a thousand years and more, where are we to look for an adequate picture of the life her citizens led, of the vast colonial

dependencies, the controlled? We have a few fads; we have a room devoted to the antiquities of Roman Britain, and then we find the mistress of many legions, and the mother of us all treated everywhere as a sort of Cinderella to her more favoured sister Greece, a mere outhouse and barn attached to a Greek palace. Our contention is that there ought to be in our great museum, if not a special department of Roman antiquities, at least special rooms devoted to them, worthy of the fame of Rome and of its importance in human history. To many of us who love art but also love history, it is quite as important to know what where the surroundings of Tiberius and of Marcus Aurelius as of Pericles and Alexander the Great. What is true of the earlier Rome is much more true of Byzantium Rome—the Rome of the mosque of St. Sophia, the Rome which inspired St. Mark's at Venice, and the glorious buildings at Ravenna and Spalato, which shook hands with the East, and by this means wedded fresh ideas to those which were becoming stagnant. Because Gibbon entitled his work "The Decline and Fall of the Romans," we have now acquired an entirely mistaken perspective in regard to the part played by Byzantium in the history of art. Byzantium lived, thrived and flourished for a thousand years after the Goths had taken Rome. Nor are the code of Justinian, the histories of Procopius and Constantine, and the magnificent buildings all over the Ægean signals of decay and decrepitude, but the reverse, and yet, where are we to look for an adequate collection of objects to illustrate Byzantine art, its rich barbaric sarcophagi, its enamels, silver plate, &c.?

My object in naming these things is to point a moral. I am afraid the Old Adam, if he is not still among us, has left his shadow behind, and there remains much for this great and powerful body to urge and to press. Archæology is the study of history by its monuments, and not a branch of æsthetics. Let us by all means guard our taste and accumulate the highest and the best, but let us also be eclectic and catholic and realise that the highest and the best of all phases of art are of supreme value, and further that what we mean by history is not only the history of kings and armies of great nobles and great philosophers, and of the arts they patronised, but also that of the crowd, by whose continuous labour the world has been, and continues to be, subdued, and whose homely and prosaic surroundings have a dramatic interest of their own.

If this be one great lesson which the wider horizon of modern archæological study has taught us, another and an equally important one is that of the continuity of art. What Herbert Spencer and Darwin have pressed upon the students of natural history we antiquaries learnt long before in regard to art, namely, that there are no jerks and jumps in its history, but a continuous flow, and not only a continuous flow, but something more. It was formerly the notion that when art took an apparently new departure and became rejuvenated after a long period of stagnation, that it was a spontaneous movement from within. We now know that in almost every case this rejuvenescence was due to contact with some new ideas which came in from the outside. A new graft into the old tree was the real source of the better fruit. Let me take some examples.

When the Mongols, who were then masters of China, conquered Persia they imported great numbers of Persian workmen, and the result was a complete change in the decoration of Chinese porcelain. The vases made by the Moors at Majorca and Valencia were probably the immediate daughters of the art fabrics of Egypt, and were certainly the mothers of Italian majolica. The blaze of flowers and ribbons which suddenly broke out this year in the hats and bonnets of English women without any apparent motive can be traced to the influence of a famous city on the banks of the Seine, where an explanation is forthcoming. The Japanese are said to have lost their eye for form and colour because their old art has changed recently for the worse. They have been in part inoculated with European taste, as they have been flooded with European products. The story is apparently universal. We see the river come out of its mountain fountain and flow down blue and sparkling. Presently we find the colour of its waters change to milky white, and realise the explanation when we trace the new colour to some effluent watering another soil which has come and joined its waters, and sometimes, as in the case of the Rhone after it enters the Lake of Geneva, the milky and the blue streams flow side by side, as the bonnets and hats of every fantastic shape and colour are mingled with older and more chaste designs on older and more sensible people. The great lesson of all is continuity.

Again, to take another illustration from natural history, a lesson of these later times in archæology has been that of "survival." We find all kinds of archaic survivals in our speech, in our fairy stories, in our clothes—everywhere, in fact, are crystallised boulders of older strata of human life, which have been accidentally preserved in another matrix, and to those who are willing to read their lesson bring, in fact, unmistakable features of another time. When we see the Italian peasant going on pilgrimages to different altars of Our Lady to be cured of different human ills, are we not reminded of the

* An address delivered by Sir Henry Howorth at the annual meeting of the Royal Archæological Institute at Shrewsbury.

similar practices in an age when Venus and her shrines were scattered over the same country and each shrine had its own Venus, just as each altar has its own "Lady" endowed with different sorts of powers? How curious it is to go to a kermesse in some old Dutch town such as Middelburg or Delft and to see the women with their curiously-shaped lace caps, and to be told that it is still quite possible to distinguish the Roman Catholic families from the Protestant ones, the distinction in the caps having arisen in the purer days of the sixteenth century, and then to turn to the bags full of curiously-shaped and coloured cakes sold in the booths, and to the roundabouts and rude swing-boats loaded with perfectly sane people, many of them sixty or seventy years old, and then to turn to Teniers's great pictures at Amsterdam and to see precisely the same cakes and the same roundabouts figured there. Are not the wooden houses coloured red ochre which dot the country the very same as were introduced by the Dutch there in the grand old days of the Norwegian herring fishing in the seventeenth century? Are not the bull-fights in Spain direct survivals of the exhibitions in the circus, no doubt introduced everywhere by the Romans, Spain having preserved its Roman colours more than any other European community, just as Spain was the most essentially Roman of all the colonies? Have we not our own fossil customs everywhere? The aldermen and common councillors of London when decked in their State robes might be living in the Plantagenet times. The beef-eating in the time of Henry VIII., the two ridiculous buttons at the back of our coats and the bands we barristers wear are useless relics of our useful garments, some dating from the time when the necessity of buttoning back the flaps of the long coats when George III. was king, and the other remains of the long collars of King James's time. Are not our judges' wigs directly traceable to the baldness of Louis XIV.? These useless things, like the many useless and monstrous and offensive adjectives used by cabmen and sometimes by school-boys, are merely survivals of things once usefully put on. The games played by school children in the gutter preserve the ritual of primæval worship and the social customs of primæval times.

Hence, as I have always urged, it becomes important and interesting not only to trace the origin of things, but also their final departure. Our dictionary makers are most diligent hunters of the first usage of words. Would it not be wise if they were also to record the last use of obsolete words, the dying flicker of a living light? The very fact we are referring to has sometimes pervaded archaeological reasoning. Because the Shetland islanders still use stone lamps and cups it does not follow, as some have urged, that a stone age in Britain is entirely a mistake. It only means, of course, that in the remote corners the very old art has lived on, just as with the names of the old mountains and rivers, the language of the earliest inhabitants has frequently been preserved. Their touches of moral poetry in our very prosaic lives are as much fossil relics of an old historical horizon as the remains which have been found by German geologists in the far-travelled limestone boulders which strew their country and belong to an age not directly represented in the solid strata of their land. The lessons we are discussing are notably prominent in the more recent works on philology, in which loan words and terms foreign to the language have been carefully rifled out, and we have thus been enabled to find not only the origin of many acts and customs, but the stage of culture at which different connected races had arrived at the time when they separated, by comparing their common names for homely or other objects. The same with folklore and the same with the rituals of different religions, all of them being among the most conservative of institutions. This multiplication of avenues by which to approach the thoughts and works of the old men has, no doubt, made our inquiry more complicated and difficult, but it has at the same time made the materials almost inexhaustible and the possibility of solving problems once deemed insoluble much more hopeful.

Let us now turn to some of the concrete results which our more powerful analysis has enabled us to compass. In the first place we have learnt that it is a mistake to confuse art with race. We cannot change our race, that is indelibly stamped upon us by nature; but art—art of every kind, including language, is not an inheritance from nature, but is as much acquired as our hats and coats. We learn all our arts. Hence we must be perpetually on our guard against the fallacy that because art has taken a new departure therefore we are in the presence of a new race. Again, we have learnt to beware of the wide-reaching, industrious and largely imaginative conclusions of a former race of archaeologists. Archaeology is a science which can only be profitably studied on inductive methods. Of this a very notable instance is the discussion on the "Origin of Man," a subject upon which there was much speculation twenty-five years ago. It has not the same living interest for us now. The fact is we realise that materials are wanting at present to enable us to carry the study very far in this direction, and the newly-fledged hopes of a quarter of a

century ago have not fructified. The origin of the human race, so far as archaeological research goes, is absolutely beyond our ken, and those who are determined to reach some result in that direction must go to the geologist for their facts and for their arguments.

The moral of the archaeological vista is this. We can take up the various specialised and elaborated civilisations which men have produced, and trace them up to simpler and less specialised forms. We can enumerate the tangle created by their mutual influence upon each other, and trace the enormous changes due to the gradual introduction of ideas and new processes, new weapons and new tools. We can trace the complicated pedigree until we reach an age when all men used very similar materials, and had very similar arts. The cramping influence of having to use them with often stubborn materials, compelled a wanting of form and of ornament which is in itself bewildering. Eventually we reach a stage where it is most difficult to discriminate among races or their characteristics by their art alone. For example, the polished stone axes left by the Caribs, then found in some parts of Europe, and then found in some parts of Eastern Asia, are almost indistinguishable. Yet how widely separated these races are in every respect. We may thus be only too easily deceived in supposing that we are getting nearer the solution of the problem of the origin of man, when our goal is the inevitable one that with his primitive weapons primitive man in many latitudes was constrained to surround himself with very similar surroundings.

A corrective to this is speedily reached when we turn to other fields of research, such as language and mythology and physical constitution. We can trace back the languages of Egypt, of Babylonia, of India and China for a long distance beyond the occurrence of regular annals in those countries; back, in fact, to the stone age in each, and similarly with the mythology, and the result is that instead of apparently reaching a common origin and common elements in them, the gap between them sometimes seems to get wider as we go further back, until we have to confess that if there was a common fountain to the various streams it must have been at a period so remote that we have no materials at present by which to trace them to it. The men who wrote the Book of the Dead, those who wrote the Epic of Sargon the First, those who wrote the Vedas, and those who wrote the Chinese classics, if they were descended, as we believe, from common parents, must have been isolated from each other for a long period in order to become so differential. At such an early date these are mere samples only. If we range further afield we shall find the same lesson meeting us everywhere. It is said that among the Indians of North and South America there are ninety languages spoken which are unintelligible to each other. The same problem meets us in the Caucasus, in Siberia, in Indo-China and elsewhere. The existence of these languages is a perpetual warning to us to be careful of dogmatism. How can we explain them except by postulating a long period, during which they have been gradually diverging from each other? We cannot measure this period by any scale or measure. When we compare Icelander with Norwegian, and remember how long ago it is that Iceland was colonised—when we compare the Mongol language, still spoken by the Buriats in Mongdin, with the language of the letters of the Mongol Khans written to the French kings in the thirteenth century, we shall have a measure of the slowness with which these changes sometimes occur. If it has taken sixteen centuries to convert Latin into the various Roman languages, how long has it taken for the diversion of the various Aryan forms of speech from their mothers' language, and how much longer to converge the Aryan, Semitic and other families of language upon a common mother? The very question is full of romantic difficulty; assuredly we are a long way from any satisfactory answer to it.

The evidence of language and of mythology is supplemented and confirmed by that of the physical features of our race—features which seem to be so conservative and so difficult to alter. If we examine the very earliest features which have been preserved in the tombs of Egypt we shall find representatives of the various races which then bordered the valley of the Nile, and we shall find that in features and in physique they are undistinguishable from the tribes still occupying the same districts. The negro, the Nubian, the Coptic Felaheen, the Semitic inhabitants of Palestine and Arabia are there pictured as we know them now. The earliest monuments of Babylonia speak the same language and discriminate clearly the various types of men in Mesopotamia. It is so with the early monuments of China, of India, of Mexico and Peru, and of the borders of the Mediterranean, and this evidence of the monuments is supported by the shapes and contours of the skulls which have been found in the earliest graves, and which show not merely sporadic variation, but variation affecting great classes. All this assuredly requires us to postulate a long period during which fresh changes were incubating and were being carried forward. We have no means of knowing how long this was. We can only very naturally conclude that since so little change has taken

place during the last 4,000 years in the languages, the customs and physical features of so many different races, we must go back a long way if we are to explain the varieties as they exist. We have no chronology of any kind for these misty regions. Dates entirely fail us. In Egypt and in Babylonia anything like positive chronological data fail about 2,500 B.C., while, as you know, the Bible dates are, before a certain period, not only based upon those of Babylonia, but they have been preserved in an entirely different shape in the Masoretic, the Samaritan and the Septuagint versions, and there is no means of rectifying them. All we can say is that the Masoretic numbers, upon which Archbishop Usher's chronology was based, and which was the basis of the calculation in the margins of our Bibles, are the least trustworthy of all, and can be shown to have been sophisticated and altered.

If I may be pardoned for referring to a work of my own in this behalf, namely, that which I have entitled "The Mammoth and the Flood," I claim to have shown that all the evidence we possess—geological, palæontological and archæological—converges with singular force upon one conclusion, namely, that at the verge of human history there was a great and widespread catastrophe, which overwhelmed a large part of the temperate regions of the earth and which caused great destruction of men and animals. This widespread catastrophe has left its mark upon the traditions of many and widely-scattered peoples. It possibly accounts for the isolation of many races in our own day, notably in districts without great natural frontiers, which isolation is due in all probability to the destruction of intervening links between the various human colonies which survived. It is a remarkable proof of this catastrophe that whereas man is the most elastic of creatures in his capacity for facing and overcoming difficulties, there is nevertheless an absolute gap in his history in large areas in Europe unbridged by any remains or by any evidence. How are we to explain this? Once man has occupied the ground he is not likely to abandon it entirely and suddenly. Wherever we find one set of men driving out and superseding another, we have evidence of gradual change (of overlapping). In the hill forts of Dorset we have Roman remains mixed with those of the Britons. In the Kentish cemeteries we have Roman remains mixed with Saxon. In the case before us, however, it is not only human art which shows a gap, but a whole fauna suddenly changes. Not a single mammoth or a rhinoceros has ever occurred with the remains of a domesticated animal. Since there are no traces of a transition, it is clear one set of men and animals did not absorb the other. To myself this sudden hiatus and gap means the occurrence of some sudden and widespread catastrophe which desolated a wide area, and destroyed its living creatures in great numbers, and the recolonisation of the wasted area by a migration from elsewhere. To this great catastrophe the traditions of mankind go back, as do the geological references we can collect. It forms the great divide in early human history. We must not, however, be misled. Some wild writers have argued as if human beings were quite different in kind before and after the divide. I see no evidence whatever of this. The human skulls found with the remains of extinct animals by Lund in the caverns of Brazil have all the characters of Indian skulls, while those found with the extinct animals in Europe have the characters of European skulls, thus showing that at this period the native races of America and of Europe had already been differentiated, and it is extremely probable that the so-called palæolithic, or, as I may prefer to call them, the antediluvial men of Europe did not belong to one race, but to several races. Those who find certain resemblances to Simian skulls in those of antediluvial man overlook the power of drawing shown in the etchings of animals on pieces of bone found in the French caves, for it is quite unmatched in after times until we reach a much later period, while the harpoons, the needles, &c., are most skillfully fashioned. Whether the Simian origin of man be a fact or not, it is clear we have no evidence in archæology as yet to bridge the gap.

If we want a key to the whole position we must turn our backs upon civilised man and explore the fertile fields of ethnography and the multiform types which we find among savage and semi-savage races. Many of these have survived from the time before the great catastrophe which did not in part affect the tropics. In these latitudes we can find abundant material to study, but man had with very rude tools fashioned for himself very respectable surroundings. These various tribes of savages are generally ignored as we study history and archæology. No greater mistake could be made. Assuredly they present us with survivals on a great scale by which we can measure and test the phases of human progress in its earlier stages, and sometime perhaps we may be able to get them all into one pedigree, and to show how a real continuity combines them all. Two lessons of great moment we may learn from them. One is that all these varieties of language, of ornament, of dress must have taken a very long time to develop, and secondly when we come into actual contact with them we are struck by the further fact that they are desperately conservative.

The so-called ring-money which marks one of the very early chapters of our archæological history, still survives in North-Eastern Africa. The ornaments and the customs of ancient Egypt may be still found lying in the Western Soudan and among the tribes of Ashanti, while, if we turn to Australia and Tasmania, we shall find human arts still in their very infancy, and so far as we know and can judge, the arts of these races have remained unchanged and unaltered since those primitive times when the Australians first introduced the dog into Australia, which means when the extinct Australian animals were still living, while we shall find among the very backward Bushmen and Esquimaux a power of designing animals, &c., comparable to that of the cave men, and languages remarkable for their structure and capacity. A third lesson which we learn is that it is quite possible, and in fact an everyday occurrence, for two civilisations which have reached very different stages to coexist alongside of each other contemporaneously in the same area, a portion in different areas. The Australian and the Englishman live alongside of each other, as the Lapp and the Norwegian, nay, to come nearer home, as the gipsy and sedentary Oxford professor, and we are led from this fact to the induction which has been too often forgotten or overlooked, that the same thing must always have been.

We talk of a stone age, of a bronze age and of an iron age, and they are excellent terms when we apply them to some particular area like Scandinavia, to which they were first applied; but they are misleading when universally applied. Many savages are still living, or were quite recently, in the stone age, the shell age, or the wooden age, like the Australians, the Marquisan Islanders and the Indians of the Amazons, while alongside of them were living the emigrants from Europe, who were not only living in the iron age, but had learnt to harness steam to iron, and to multiply human labour tenfold. Not only so, but it is obvious that in such cases there may be a great jump in civilisation from a very low to a very high step on the ladder without the necessity or the possibility even of intermediate steps. A bronze age or a copper age is not at all likely to intervene between the hewers of rude stones or of polished stones in the Pacific and many parts of America; and, in fact, it may be said that the stage we sometimes associate with palæolithic man (very wrongly, as I think), namely, that in which the Tasmanians and Australians lately lived, may be immediately followed by an iron age. I say wrongly because we cannot argue that the men who lived in our prehistoric caves and were contemporaries of the mammoth, whose portrait they scratched on ivory, were the same race themselves as the low type of men discovered in Tasmania. Diogenes was a philosopher and not a dog, as he called himself, although he lived in something very like a kennel, and the men who invented and elaborated the Vedanta philosophy, although living with the simplest surroundings, are not to be measured with the unbeloved and unreclaimed wild hunters of the Kurdi mountains, among whom the arts of life were at least as much advanced.

(To be concluded.)

THE SURREY ARCHÆOLOGICAL SOCIETY.

AT the annual excursion of the Surrey Archæological Society some forty or fifty members met at the Farnham railway station for the purpose of exploring objects of antiquarian interest in this beautiful part of the "hop country." Mr. Mill Stevenson, hon. secretary, had six or seven brakes to meet the members and friends arriving at 11.45 at the station, and quarter of an hour later they were *en route* on a visit of inspection to the historical churches of Bentley, Froyle and Cron dall. The party included Dr. Chambers, Messrs. H. M. Robson, J. F. Eastwood (Esher), T. W. Stevens, C. F. H. Lewes, T. M. Clark, C. F. Hayward, A. J. Style, A. Sprung, W. Wien, B. F. L. Potts, F. Price, Mill Stevenson (hon. secretary), C. Ekin, A. M. Cook, Ambrose Cook, T. Howse, F. Vanderpant, H. W. Vanderpant, J. Durham (St. Gabriel's, Surbiton), R. G. Price, W. F. Potter (Peckham), and a large number of ladies. Passing Alice Holt Woods Pottery Works, Bentley Church was reached about one o'clock, where the rector, the Rev. O. C. Lang, acted as conductor. Dealing with the early history of the church from his own observation, Mr. Lang said he was not aware of a record in Domesday Book stating that there was a church there of an earlier period, but when constructing a drain on the north side of the churchyard a concrete foundation was discovered which seemed to point to some earlier building. The older part of the present church, he supposed, dated from 1120 or 1130, this being also the time of the founding of Waverley Abbey. When the work of renovation took place on the last occasion it was observed that the west wall of the north aisle contained many fragments of Norman capitals (upon which were some pretty scrollwork) and mouldings, and the Norman font was also recovered, although it was very much injured. Referring to the glass found in the east chancel window, the

speaker said it had been pronounced to be beautiful English work of about 1450. He concluded by giving interesting details of the bells, the brasses and the monuments, and said the parish register dated back from 1539 and was in good order. An adjournment was made to the Red Lion Inn for refreshments. The journey was continued through magnificent country, and at about quarter to three the brakes were again forsaken for an inspection of Froyle Church. This edifice consists of a chancel and large nave, the latter, together with the tower, being rebuilt towards the end of the last century in 1772. Portions of the chancel had been destroyed completely. The principal historic part of the building is the stained-glass window in the east side, which dates back from 1360 to 1380, and consists of numerous coats-of-arms.

Mr. Stevenson was of opinion that it had the finest display of heraldry in the whole of Hampshire. He also mentioned that it was intended, when they came to Froyle, to visit the park, where, it was reported to him, was a house which existed in the time of Charles I. From observations he had made, however, he was sorry to find there was nothing to convince him that the house was occupied in those days. Leaving Froyle, Crondal Church was reached, where the party again alighted, and were escorted around the building by the Rev. M. C. Baynes, who read a paper on the church (a late Norman building) and its traditions, and explained how it suffered under Cromwell.

Mr. Stevenson considered that many things had been attributed to Cromwell which he never took a hand in. They could rest assured that if Cromwell and his soldiers desired to do anything to the church they would have erased it from the earth altogether. He was under the impression that the depredations complained of by Mr. Baynes must have taken place in the Georgian reign.

Mr. Hayward suggested that some of the younger members should visit the church to work up its history thoroughly, and to get the result of their investigations published for the benefit of the Society.

Mr. Stevenson reminded Mr. Hayward that Crondall was in Hampshire, and in going so far as they did the members of the Surrey society were already trespassing.

The party then returned to Farnham, after having spent a most enjoyable day, and partook of a cold luncheon at the Bush Hotel. Mr. J. F. Eastwood presided, and, after the loyal toasts, proposed "Success to the Surrey Archaeological Society," coupling with the toast the names of Mr. Mill Stevenson and his colleague, the Rev. T. S. Cooper, who was absent. The churches they had visited afforded them much interest, and he suggested that some of the members should pay Crondall Church a purpose visit for the collection of further particulars. The thanks of the members were due to Mr. Stevenson for the arrangements he had made for the excursion.

THE NILE RESERVOIR.

A MEMORIAL has been recently forwarded from the Society for the Preservation of the Monuments of Ancient Egypt to Nubar Pasha, in which the signatories, which include a large number of representative authors, men of science, artists and others in public positions, state that inasmuch as the monuments of Egypt are the interest of the whole world, they desire to recall to his Excellency's attention the facts which have been published in the admirable study on the subject of "Perennial Irrigation" by the Under-Secretary of State for Public Works, a report which has opened a magnificent prospect of increased prosperity to Egypt, at which they most heartily rejoice. "We remark," they continue, "that the Technical Commission have recommended the construction of a reservoir dam at Assouan which will submerge the largest and most important parts of Nubia and ruin the temples of Daboud, Gertasseh, Tafah, Kalabsheh, Dakkeh and Aff-ed-Donieh, as well as the towns, cemeteries and other remains of this region, besides leading to the removal or ruin of the various temples of Philæ, which are some of the most beautiful monuments in Egypt. We therefore express to your Excellency our deep regret at the recommended construction of a reservoir at Assouan which will cause such results, so unhappy for science and art; and we trust that some other project will be considered in order to reconcile the interests of agriculture with those of art, history and archaeology. We hope that before the immediate season for action arrives some efficient scheme may be adopted which will avoid so far as possible the destruction of valuable monuments. We do not wish to express our opinion as to the best manner of carrying out the important object of improving the irrigation of Egypt, as this is a point for the Egyptian Government; but we would venture to ask whether it is not possible that an equally good site may be found at some place south of the second cataract, when, as it is to be hoped, the country may again be reopened in a few years to civilisation under the rule of Egypt." Besides the foregoing memorial to Nubar Pasha from England, Scotland and Ireland,

others of similar tenor and purpose have been prepared in France and sent forward by the Académie des Inscriptions and by about 250 of the foremost members of the Institut de France. In Germany about 600 distinguished persons, including Egyptologists, professors, artists, antiquaries, archaeologists and literary men, have joined in a very strong protest against the submersion of Philæ.

GENERAL.

The French Minister of Fine Arts has appointed M. Charles Yriarte and M. Henri Havard to be inspectors-general in his department.

An Alteration in the rules of the Sheffield Society of Architects and Surveyors has been agreed to, and henceforth, in addition to the three classes of members, viz. fellows, associates and students, a fourth class of honorary members, not practising as architects and surveyors, may be admitted.

A Leipzig Amateur has given 60,000 francs towards the erection of the monument of Schumann, the composer, which can now be undertaken.

"Chaldea to Canterbury" is the title of a series of university extension lectures which will be delivered in Melbourne by Mr. A. Henderson, C.E.

The Late Sir A. H. Layard has bequeathed the portrait of his uncle, Benjamin Austen, by Sir M. A. Shee, P.R.A., to the Incorporated Law Society. All his other pictures (excepting portraits) are to be offered to the trustees of the National Gallery.

The Annual Meeting of the Kent Archaeological Society was held at Faversham on Tuesday, under the presidency of Earl Stanhope. There were visits to the parish church, the grammar school, Davington Priory and Preston Church.

Messrs. Debenham, Tewson, Farmer & Bridgewater have sold the site of the church of All Hallows the Great in Upper Thames Street to Alderman Sir Francis Truscott for 13,100*l.* The money will be devoted to the erection of a church in the St. Pancras district.

The London County Council intend to erect residences for 664 people in Goldsmith's Row and Cable Street, at an outlay of 25,833*l.*, "without the intervention of a contractor."

The Norwich Castle Museum will be opened by the Duke and Duchess of York in October.

A Model of M. Falguière's group, *The Republic overcoming the Monarchy*, has been set up in the Panthéon, Paris, in the place formerly occupied by the high altar.

Dr. R. Rowand Anderson recently had a conference with a sub-committee of the Lord Provost's committee as to the vote from the Residue Grant to the School of Applied Art. Hitherto 1,000*l.* has been given, a sum which it is desired should be continued, but no resolution was arrived at as to the allocation of the money.

Mr. Osler, treasurer of the Public Picture Gallery Fund, has offered to the Birmingham Corporation, for the Art Gallery, an original sketch, called *The Old Gate*, by the late Fred Walker, A.R.A.; and a letter was also read from Mr. W. B. Avery, offering the Corporation a portrait of his uncle, the late Mr. Thomas Avery, to be hung in the Council House. Both gifts were accepted.

An Anonymous Donor, it is stated, has given the sum of 1,000*l.* to the Fathers of the Oratory towards the completion of the church at Brompton.

Messrs. Clark & Moscrop have been appointed architects for the new Board schools in Corporation Road, Darlington. In the competition among local architects they gained the first and second places. Mr. G. G. Hoskins obtained third place, Mr. Frank Martin fourth, and Messrs. Pritchett fifth.

Professor Banister Fletcher has been nominated by the City Commission of Sewers to represent that body at the Congress of Hygiene in Buda Pest.

Lord Calthorpe and his son have made over Calthorpe Park in perpetuity to the Birmingham city authorities.

The Glastonbury Antiquarian Society have just made an excursion to Westbury-sub-Mendip, and inspected the parish church. Rodney Stoke and Cheddar were afterwards visited.

The Annual Meeting of the Somersetshire Archaeological and Natural History Society will take place at Langport on August 18 and two following days, under the presidency of Mr. E. B. Cely Trevilian. The excursions will be under the direction of Lieut.-Col. J. R. Bramble, and Mr. Edmund Buckle will describe the architectural features of the places to be visited.

Mr. E. Seward has been appointed architect for the exhibition buildings which are about to be erected in Cardiff.

The Architect.

THE WEEK.

THE action taken by Mr. L. O. WILLIAMS, of Liverpool, for the recovery of 130*l.* for the preparation of plans, specification, quantities, &c., which was tried before Mr. Justice BRUCE on Wednesday, did not end satisfactorily. The defendant, Mr. RAE, an estate agent, asked Mr. WILLIAMS to prepare plans for two villas at Liscard, which were to cost only 1,200*l.*, although a rent of 60*l.* was expected to be obtained for each of them. Alterations were made in the plans in spite of the plaintiff's warning that the cost must be increased. The last tender received amounted to 2,100*l.* The defendant expressed an intention of allowing the scheme to drop, but it was alleged that the villas were in progress according to the plaintiff's plan. The claim was based on 2½ per cent. on lowest tender for plans, ¼ per cent. for obtaining tenders, besides 53*l.* for the quantities. The defendant's case was that his limit of cost was 1,200*l.*, and that he was never informed that his suggestions for improvement in the plans would involve greater expenditure. The plans were no use to him. He could not build up to them, and it was not true he was using them. Evidence for the plaintiff went to prove that the kind of houses required by the defendant could not be built for 1,200*l.*, and that plaintiff was entitled to what he had charged; and for the defendant to show that considering that no tender had been accepted plaintiff was not entitled to the percentages charged. The jury were two hours engaged in considering the case, but as they could not agree they were discharged.

A STATEMENT by Sir J. D. LINTON and Mr. ORROCK about the decay of British pictures in the National Gallery is almost alarming. It is to be expected that an excessive use of asphaltum does not insure permanence; but the two artists declare that on July 31 the pigment was "running." They mention as examples of deterioration WILKIE'S *Blind Fiddler*, *Village Festival* and *Knox Reading the Bible*; STOTHARD'S *Greek Vintage*; STANFIELD'S *Zuyder Zee*; TURNER'S *Orvieto*, *Apollo and Daphne*, *Child Harold's Pilgrimage*; CONSTABLE'S *Valley Farm*. LESLIE'S *Uncle Toby* and *Widow Wadman* has also suffered; but "some housepainter's work" was placed in the deepest cracks and gashes of it, as well as in other paintings. Sir J. D. LINTON and Mr. ORROCK assert that the evil is remediable. They say there are thousands of English pictures in which asphaltum has been used which have not run, simply because they have not been subjected to a high temperature. They found that on July 31 the temperature of some of the British galleries was about 75 deg. The mean temperature of dwelling-houses is 60 deg., whereas in the National Gallery a greater heat, and a dry heat, prevails. This is the chief cause of the evil. They believe that a certain amount of moisture in the air, under the influence of a gentle draught, would save the British pictures. This process will even prevent an asphalt pavement from bubbling under a burning sun. They ask therefore, Why should water, in grated troughs, for instance, not be used to temper the hot air, and even refrigerators provided to secure an average temperature? The subject is important. The late director could be seen at all hours in the Gallery scrutinising the treasures, and his successor, we are confident, will be no less anxious. But as the decay has attained some magnitude the trustees would do well to seek the advice of a committee of experts. If the temperature and dry air are the causes there ought to be little difficulty in finding a remedy to abate their power.

MR. E. C. BOOTH, who died on Friday last, was, according to the *Leeds Mercury*, probably the oldest of the present generation of Leeds artists, having been born so far back as 1827. MR. BOOTH studied at the Leeds School of Art, and subsequently with the late THOMAS SUTCLIFFE. His name became known to the public on his first exhibiting at the Royal Academy, when Mr. RUSKIN was bringing out his yearly "Notes" on some of the principal pictures.

It was in one of these pamphlets that Mr. BOOTH'S picture, *The Roadside Spring*, was noticed, and of which—in consequence of its position (much below the line)—Mr. RUSKIN said, "You must examine it kneeling—there is no other way." Though commencing as an oil-colour painter, Mr. BOOTH devoted himself mostly to water-colours later in life. His work was always conscientious and truthful to nature, and it might be justly said that in many instances he put more work into one of his pictures than would have served for several in the hands of most artists. Of a retiring disposition and very delicate constitution, Mr. BOOTH did not achieve that celebrity which many others with probably less talent but of more robust health would have easily obtained.

THE twenty-five sets of designs for the proposed Local Board offices, fire-engine station, stables, &c., at Littleborough were submitted to Messrs. WOODHOUSE & WILLOUGHBY, of Manchester, for report. The assessors have testified to the general merit of the designs, which increased the difficulty of arriving at an equitable decision. The first place was assigned to design No. 23. The grounds for selection were:—(1) Adherence to conditions; (2) simplicity and regularity of planning; (3) ample and diffused light throughout; (4) the rectangularity of the rooms; (5) excellence of proportions of offices, staircases, corridors, &c.; (6) arrangement of lavatory accommodation at back of building, being isolated by a "blow-through" ante; (7) picturesque elevations; (8) keeping down of superficial areas throughout; (9) economical utilisation of yard space at back. It was found that No. 23 was the work of Messrs. CLARK & HUTCHINSON, of 28 John Street, Bedford Row, W.C. The second place was assigned to design No. 14A, by Messrs. DUNCAN & BUTTERWORTH, of Rochdale, and the third place to design No. 3, by Mr. CHARLES T. TAYLOR, A.R.I.B.A., Oldham, both being "very commendable schemes." The Local Board have adopted the assessors' recommendations.

THE annual meeting of the Somersetshire Archæological and Natural History Society will be held at Langport on Tuesday, Wednesday and Thursday in next week, under the presidency of Mr. E. B. CELY TREVILIAN. Among the buildings visited will be the parish church, Langport, the chapel of St. Mary, Huish parish church, Castle Dyke, Cathanger Manor-house, Isle Abbots Church, Langford House, Swell Church, Court House, Curry Rivel Church, Muchelney Church and Abbey, Low Ham Church and Manor-house, High Ham Church, Aller Church, Somerton Church, Long Sutton Church and Kingsbury Episcopi Church. Mr. EDMUND BUCKLE will describe the architectural features of the buildings.

AUGUSTE CAIN, the French sculptor, might be considered as a sort of successor of BARYE in the representation of animal forms. Work of that class obtains more admiration in France than in England. CAIN was not satisfied with lithe and active beings like lions and tigers; he also attempted, and with success, to employ the rhinoceros and crocodile in his groups. He made no concealment of animal ferocity. AUGUSTE CAIN was born in 1822, and was the son of a poor soldier. When he was ten he was apprenticed to a decorator. He was fortunate in obtaining admission to the ateliers of RUDE and BARYE, for he could not find masters among all the sculptors who were better adapted to develop his genius. BARYE was mainly dependent on the manufacturing bronzists, and he introduced CAIN to his patrons. The young sculptor was not satisfied to spend his life modelling paper weights and ornaments for the table and chimneypiece. His ambition was to produce works on a grand scale for the adornment of public gardens and buildings. In 1864 he was able to obtain a medal for a figure of a lioness, and the authorities were not slow in offering him commissions. His *Tiger Strangling a Crocodile* and *Tigers Attacking a Rhinoceros* are known to all visitors to Paris. The Duc D'AUMALE employed his talent for groups suggestive of the chase at Chantilly, and CAIN became in a few years one of the representative sculptors of France.

THE SCIENCE AND ART DEPARTMENT.

THE sight of a brave man struggling with misfortunes was, if the school books are correct, gratifying to the old gods, but if the Olympians still existed they would be likely to admire even more the efforts of a minister who endeavours to reform one of the English Government offices. Strong statesmen have been overcome repeatedly in efforts of that kind, and have concluded that ordinary courage is not equal to undertake a duty before which HERCULES himself would hesitate. The country has therefore reason to be grateful to Mr. ACLAND who, after two years' encounters, has not abandoned the contest with South Kensington officialdom. It will be said perhaps that his exertions have not produced much gain; that was inevitable. If we remember how numerous are the people not only at South Kensington but all over the country who believe it is their interest to uphold the existing system because they derive profit from the defects, it will be evident that the most zealous minister cannot overcome or convert them unless by degrees. There is no trumpet which can make the Department's ramparts fall at a sound. The abuses have become consolidated by time and negligence and they are not to be overcome without the help of years.

The new report of the Science and Art Department is, however, evidence that already something has been gained. There is, for instance, more than the average amount of plain speaking about the weakness of what is accepted as "science" and "art." Lord ROSEBURY and Mr. ACLAND, in explaining their reasons for the appointment of the thirteen new inspectors, testify that "in some subjects of science aided by the Department, we are of opinion that the instruction given is not sufficiently practical," a conclusion which, if tardy, is creditable to the official understanding. Unofficial Britain was sorrowfully aware of that fact for a great many years. They also admit that what are supposed to be organised science schools in which education is not apparently circumscribed by an official syllabus are degenerating under the influence of one of the evils created by the Department, for the President and Vice-President confess that "so long as the present system of payment on results is adhered to in its entirety, there is a danger of the neglect of those subjects which are not included in the Department's directory, and of their being made subordinate to instead of co-ordinate with them." In other words, the Department is not satisfied with retarding the education of the students in the official schools, but is endeavouring to bring about a similar result elsewhere, in order that the whole country shall be of a uniform incapacity. For a school to be affiliated with the Department may be an advantage financially, but unless Mr. ACLAND succeeds in attaining a reform, it is not an educational advantage for the students.

To dream of that reform requires extraordinary courage and public spirit. The reports which some examiners have prepared on the works of the students in the classes of the Department are enough to make any man disheartened. It is no wonder so many presidents and vice-presidents have been afraid to meddle with so appalling a condition of mismanagement. Let us take a few examples from those parts of the reports which are supposed to have general interest. Of the "Freehand Drawing of Ornament" it is said "many drawings are so bad that it is evident that some students who attempted this examination are quite unprepared to sit for the advanced stage," and the "prevailing defects are those of false proportion in leading curves and masses, of non-continuity in curvature, and lack of character in foliage." The examiner in Perspective says he is sorry "to have to report that several of the papers bear evidence of cramming." In Elementary Design the students appeared incompetent to understand plain instructions, and sometimes, in consequence, "it is only through faith in the good intentions of the candidate we could give any marks." In Advanced Design there was not any ability that was very remarkable for wall-papers, although the subject is one to encourage an exhibition of talent; while the schemes for the decoration of a school wall submitted by the candidates for honours "showed, generally speaking, a want of sense of scale in ornament and architectural proportion, and a very imperfect perception of the ornamental use of figures, as well as want of power of drawing the same." The examiner in

Anatomy was amazed when he found so few students could answer a question about proportion. "This is to me," he says, "the more remarkable, as I would have thought that this was essentially a matter of importance to the art student, and one a knowledge of which he might reasonably have been expected to possess; the more so as 'proportion' is an important topic, coming within the province of many studies in art besides that of anatomy." There are some sections in which a more creditable average of production was submitted; but, so far as can be ascertained from the report, the larger part of the work sent in for examination was faulty.

The reasons are not far to seek. The latest report is the forty-first, and when a bad method is allowed to continue for forty years an amendment is not easy. All the teachers were brought up according to that method, and they have had no chance of testing one of a different character. Every year, too, prominent men have come forward and made orations about the official method and the enormous amount of good which the country was deriving from the schools. Worse than that, artists have been discovered who readily allow themselves to be set up as the approving witnesses of all the operations, if not as examples of the products which are turned out. There are signs that Mr. ACLAND can realise the true value, not only of the teaching but of the endorsement it has received, and if we could suppose his tenure of office was likely to last for a couple of years longer, there would be grounds for anticipating a reform.

When so much is unsatisfactory about the drawings, models and other works of art, as well as about the answering in science, the increase in the number of schools and classes and in the students attending them cannot give rise to much congratulation among those who have rational views of the purpose of education. To many people the most satisfactory sentence in the report is the announcement that "many classes in which instruction of a very elementary nature had been given were closed or ceased to have any connection with the Department." If the same process were applied to classes in which "the instruction given is not sufficiently practical," it would be advantageous not only for the country but for science and art also.

The necessity for some revolution in the teaching as well as in the administration is shown by a few figures more emphatically than by any other form of demonstration. In the examinations of the science schools in 1892 there were 203,347 papers worked, and the failures were 66,569, or less than a third of the number. Last year only 201,597 papers were worked, but the failures rose to 118,086, or considerably over one-half. In art there was little compensation for the collapse of the science students, for out of 141,581 papers worked, 79,428, or eight-fourteenths of the total, were failures, while in the preceding year there were 72,001 failures upon 126,143 papers, or, say, seven-twelfths of the entire number. As the expenditure of the Department during 1893 amounted to 666,308*l.* it can hardly be said that the success, such as it was, was attained on economical terms.

ENGLISH ECCLESIOLOGY.*

IF all the subjects relating to churches and ecclesiastical buildings were prohibited from forming part of archæology, that branch of knowledge would become exceedingly circumscribed in this country at least. It was fortunate, therefore, that vandalism and other species of reform were less thorough in action than in theory. The buildings have become invaluable as evidence and as the subjects for countless controversies. Moreover the clergy, from having charge of old churches, were induced to study archæology, and for many a year they helped to foster it. For those reasons ecclesiology has claims on the attention of archæologists who devote themselves to pagan and secular subjects.

At the present time, neither ecclesiology nor archæology can be considered as popular subjects. But in the early part of the century, and in the eighteenth century also, still less attention was given to it. When "SYLVANUS

* *The Gentleman's Magazine Library: Ecclesiology.* Edited by F. A. Milne, M.A. London: Elliot Stock.

URBAN" hospitably received communications about old churches and other survivals of antiquity, he was therefore doing as benevolent work as if he founded a foundling hospital or a refuge for castaways. He helped to keep archæology alive. At first the waifs and strays that arrived at St. John's Gate were not of much account, but as years rolled on shelter was sought by a superior class. Mr. GOMME has exhibited a great many of them, and those which belong to ecclesiology are at least as interesting.

The contents of the book are arranged in three divisions, viz. Early Church Building, Church Interiors, and Church History. The first part is made up of correspondence about Lyminge Church, the question at issue being whether the existing building dates from the seventh century or from the eleventh. Mr. R. C. JENKINS upheld the former theory, while Mr. J. H. PARKER, who was disposed to be sceptical about very ancient buildings, took the other side. The problem turned on the date when churches of masonry superseded timber buildings. It is believed that a monastery was founded at Lyminge in the eleventh century, and the foundress, St. ETHELBURGA, was buried "in the north-east porch (in aquilonali porticu) of the church against the south wall, covered with an arch." Mr. PARKER considered that instead of north-east porch we should say "the north aisle," as porticus was often used in that sense by Mediæval writers. He also concluded that the present church was built of fragments of an earlier church of Roman origin. Mr. JENKINS agreed about the use of materials from an earlier church in the building, but he would not yield about the accuracy of his translation of portico into porch. According to him "porticus," in the writings of the seventh and eighth centuries, never means aisle, but always porch. When the porches of the older churches were covered and formed into aisles, carried along the original external wall, then the word became equivalent to aisle. In BEDE the word always means porch; and ISIDORE of Seville, the highest authority on the meaning of such words in 600-800, gives only the ancient meaning. In fact, it was by the ancient councils (especially of Nantes) made unlawful to bury in churches, the porch and the outer walk being alone permitted for the purposes of burial. Mr. PARKER, in reply, was able to cite many cases in which the Latin word suggests aisles rather than porches. One was from ALCUIN's description of a church in York, which was written about 780. One line, "Pulchraque porticibus fulget circumdata multis," was considered by Professor WILLIS to refer to many aisles or apsidal chapels. He also quoted passages from which the space where bodies were interred was supposed to be within the church, and must therefore mean an aisle, transept or chapel. Mr. PARKER took the opportunity to express his conviction "that the churches of the tenth century were so generally of wood only, that very strong evidence is necessary to show that a particular church of stone is of that period." Mr. JENKINS was, of course, able to furnish passages which were no less confirmatory of the identity of porticus and portico. On the more important subject of materials he referred to documentary evidence of the erection of churches of stone in Belgium, Rome, Normandy, Cambrai, Augsburg and England. Mr. PARKER, in his reply, argued that the documents supported his views. As regards Rome, where masonry might be supposed to be always in demand, he said:—"If Mr. JENKINS will arrange to make an excursion to Rome with me, I will engage to convince him by the evidence of his own senses that all the early Christian churches in Rome, from the fourth century to the twelfth inclusive, are built of brick. The brickwork is more or less hidden or disguised, but the real structure is of brick, and the marble columns are for the most part antiques." Various archæologists took part in the contest, and their opinions are of much interest. But after all it cannot be said that the communications made it any clearer whether the Mediæval porticus was within or without a church, and whether in the tenth century there were enough masons in England who were competent to erect a church.

The second part of the volume is more diversified. There are essays by WILLIAM BURGESS on "Mediæval Mosaics," and by ALBERT WAY on "Pavements of Figured Tiles." But the majority of the contributions are anonymous. Among the subjects treated are church towers and bells, chantries, confessionals, mural paintings, rood-lofts,

stained-glass, tabernacles, sculpture, &c. In the third part, relating to church history, is an essay by Mr. C. A. BUCKLER on the churches of the Dominicans, besides others on cathedrals prior to the civil wars, cathedral schools, documentary history of English cathedrals, the bishop's palace and ecclesiastical buildings of Wells. All of them merited reprinting, and it is to be hoped the present will not be the only volume devoted to ecclesiology in the series. It would be an advantage in the next collection if the woodcuts which accompanied the articles were reproduced. The absence of them diminishes the value of Mr. BURGESS's mosaics, the essay on church bells, &c., where reference is made to figures, and which are therefore necessary to make the text clear.

THE SCHACK GALLERY, MUNICH.

SINCE the days of its first art-king, Ludwig of Bavaria, says a correspondent of the *Scotsman*, Munich has been the art city of Germany. At the present time there is something almost pathetic in its distrust of all innovations prompted by the utilitarian spirit, and its determination that every one entering its gates shall bow the knee before the shrine of the æsthetic. Berlin, and Dresden, and Leipzig may engage in a series of demonstrations on "municipal housekeeping," and devote themselves with fanatic enthusiasm to the details of street cleaning and street architecture. Munich remains unswept and ungarnished. The public offices are sacrificed to the museums of sculpture and painting. A due regard to the health and convenience of the community is held as the badge of a most reprehensible Philistinism. In Munich art is king, and the artist is the aristocrat. He is the only man to whom public opinion accords the dignity of a silk hat. He is the only man, with the exception of the hotel-keeper, who makes any money. In Munich Lenbach is a mightier man than Bismarck, whose portrait he paints, and the Lenbach villa is almost as princely, and in very much better repair than the palace of the Bavarian kings.

Within the last few weeks Munich has passed through a crisis. It has been in danger of losing a possession of which for many years it has been deservedly proud—the small but very valuable collection of pictures belonging to the late Count Schack. The Schack Gallery has been for more than twenty years one of the sights of Munich, a "place of interest" that the conscientious tourist finds himself quite unable to ignore, since it stands in "Baedeker" marked with an asterisk, sharing that proud distinction with the National Museum, the Glyptothek and the two Pinakotheks. It is in part owing to the honour thus conferred upon it that not a few of the visitors to Count Schack's collection leave it with a certain sense of disappointment. In most cases they have come there straight from the Old Pinakothek, from the Rubens Gallery, where Rubens is to be seen in greater perfection than in his own Antwerp; from masterpieces of Vandyke, or Rembrandt, or the great Italians; from Murillos, whose rivals are scarcely to be found in all the galleries of Spain; and, in comparison with these, the little private collection, with its copies from the old masters and its hundred or so of pictures by contemporary German artists sinks into insignificance.

Yet the Schack Gallery fills a unique place in the history of modern art. It marks the turning-point when, after centuries of sterility, Germany once more proved herself capable of producing an artist who should rank with the great masters. The Schack Gallery contains, besides much that is of less value, pictures by the well-known artists Lenbach and Feuerbach—above all, a number of the earlier works of Germany's great idealist painter, Arnold Böcklin. The significance of the gallery lies in its possession of these pictures. The treasures of the Pinakothek bear record only to a great past, for the most part to the past of other nations, the presence of the great masterpieces of Holland and Italy in the Munich and Dresden galleries having indeed hindered the growth of an independent school of painting. Feuerbach, Lenbach, Böcklin were the first among the modern Germans to act on the principle that imitation, however excellent, is not the end and aim of art.

So far back as the fifties Count Schack recognised their merit, admiring in their work a quite new quality of strenuous earnestness in depicting what they themselves saw, a determination, in face of all criticism, to stand or fall in their own strength or weakness. He bought their pictures and opened his galleries to the public, and to his patronage it is largely due that Munich is at the present time the seat of a school of painting which has already made its mark outside Germany, which every year contributes notable pictures to the Paris exhibitions, which deserves least of all to be ignored by Scotland, since it has during the last five years extended a generous patronage to the artists of the Glasgow school.

When it became known, on the death of Count Schack some weeks ago in Rome, that he had bequeathed his gallery, not in accordance with the general expectation to the city of Munich, but to the Emperor William, and that the pictures would in all probability be removed to Berlin on the earliest opportunity, something like a panic arose. A Munich without its Schack Gallery was to its citizens almost as inconceivable as a Munich without its Pinakothek. That their loss was to be the gain of Berlin, which has quite lately been presumptuous enough to set up an art school of its own, was a prospect that it was impossible to regard with equanimity. But the Emperor has been generous. Greatly as he must have coveted Count Schack's collection for a city which it is his cherished object to make the capital of the empire in every sense of the word, he has left Munich in possession of its treasure. He has done more. He has bought from Count Schack's brother the house in which the collection has grown together, and taken steps to insure that the pictures shall remain permanently within its walls. The concession he has made is a great one. He has practically given Munich a new lease of life, with his pledge that it shall have his recognition as the art city of the empire.

The unique attraction of the Schack Gallery consists, as has been said, in the dozen or so of pictures painted by Arnold Böcklin, the one great master that Germany has produced in modern times—the greatest German painter, perhaps, since Albrecht Dürer brought his art to its early perfection in Mediæval Nürnberg. Böcklin stands alone among his contemporaries. He has studied in every school, but no school can claim him as its own. He was born in Basel, he studied in Brussels and Antwerp, in Dresden and Geneva. He was in Paris during the bloody July days of 1848, earning there a bare subsistence by illustrating surgical cases for the doctors attending the wounded. He has lived sometimes in Weimar, sometimes in Zurich, often in Munich, lured there by its art treasures, oftener still in Rome or Florence, or at San Terenzo, on the Gulf of Spezia. He has not lived in a groove, and he has not painted in a groove. Other artists have constituted themselves specialists, made themselves interpreters of nature in one or another phase, delighting above all in the reiteration of some favourite theme. Böcklin's subjects are almost as numerous as his canvases. The commonplace and the heroic, the desert and the village, tragedy, comedy, myth, fairy-tale, farce—he is inexhaustible as nature herself. Scarcely ever does he repeat himself. Men, women, witches, satyrs, fauns, dragons and sea-serpents, combinations of men and animals more marvellous than the old mythologies ever dreamed of, live in his pictures. Böcklin is painter, he is also poet and philosopher. Imbued with the spirit of classical antiquity, he is at the same time the most modern of the moderns. His tritons and naiads, his centaurs and fauns, his Pans and satyrs are no mere imitations of the bronze and marble treasures of museums, of gypsum reliefs and marble torsos. They are new creations, full of the poetry of the old world, yet in perfect harmony with the laws of organic formation as taught by the science of the nineteenth century. Without their superstition Böcklin has the feelings of the old Greeks for nature. For him every waterfall has its nymph. For him, as for Homer, the flash of lightning is a fiery bird, the clouds are the flocks of heaven. There have been in the past classical revivals enough, Dürers and Mantegnas, Canovas and Thorwaldsens, to bring to light the fossilised remains of a dead world—a world that Böcklin now reveals to us for the first time, fantastic and poetic, glowing with passion and colour like our own. His *Pan* of the Schack Gallery, whose demoniac laughter sends a shepherd and his goats flying terrified over rocks scorching in the mid-day heat, is the very Pan of Greek myth, the picture is the perfect expression of "panic fear." His dragon, stretching its scaly hideous neck down from a chasm in the rocks towards three travellers clinging together in an agony of fear is a monster with all the sinuous horror of the dragons of old times. Yet its prototype is to be found in the realms neither of natural history nor mythology. There is a singular appropriateness between these pictures and the studio where they were transmitted to the canvas, a studio as unlike all other studios as Böcklin is unlike all other artists—a long bare room, empty of the usual paraphernalia of easels and bits of drapery, and finished and half-finished canvases, the walls hung with black, with here and there a strip of brilliant colour that produces an almost weird effect on the mysterious dusky background.

Besides imagination and a striking originality, Böcklin has one other gift that has always been characteristic of the great poets—an artistic unity, a "unity of feeling," as Coleridge calls it—which he, as a critic, has found rendered in its highest perfection in Shakespeare. "Read 'Romeo and Juliet,'" he says. "All is youth and spring—youth with its follies, its virtues, its precipitancies; spring with its odours, its flowers, its transiency. It is one and the same feeling that begins, goes through and ends the play." So it is everywhere in Shakespeare—in "Lear," in "The Tempest," in "The Winter's Tale"—and in so far as the scope of his art permits, so it is also with Böcklin. He

paints Odysseus on the sea-shore, and the grey landscape, with its limitless horizon, is in perfect accord with the mood of the wanderer looking out sadly towards his far-off home. Psyche is crowned by Eros in an atmosphere of sunny radiance. The meadows are gay with flowers and butterflies; the sea reflects a perfectly unclouded sky. Prometheus lies fettered to the rocks, a dim, lonely figure in the wilderness of the great Caucasus, struggling to break the chains that bind him there. And all nature struggles with him. Heavy masses of cloud are driven across the sky, ghostly lightnings flash, the wind spends itself in blind fury on the mountain sides. The *Prometheus* is one of Böcklin's later pictures, and was exhibited in the Munich exhibition in 1893; but the same artistic unity characterises his earlier canvases in the Schack Gallery. In *The Anchorite* a hermit, an old man, half naked, kneels before a rough cross on a steep mountain side. Ravens fly above his head. A bit of blue sky that seems to belong to some other world is seen between the gnarled and twisted branches of the trees. The scenery is wild and stern, and the spirit of the man chastising himself before the cross is stern and pitiless as the rocks. Another picture in the Schack Gallery is entitled *The Ride of Death*. Death is riding a black horse through the forest on a wild autumn night. Around are great trees, many of them shattered by previous storms. The horse starts at a blinding flash. In the momentary light showers of yellow autumn leaves are seen falling to the ground. In its mingling of grandeur and desolation Böcklin's rendering of *Death* has hardly been surpassed.

Böcklin is a colourist of rare power and originality. Boldly, with an absolute recognition of their value, he has from the first made use of the clear, pure prismatic colours that other artists banished from their canvases as crimes against the æsthetic. The wonderful brilliancy and pellucid clearness of the water in his mermaid pictures, and the play of light upon the strange forms, half-fish, half-maiden, that frolic in its depths, seem indeed to have been transferred to the canvas by some sort of magic. Like Leonardo da Vinci, and with more uniform success than Leonardo da Vinci, Böcklin has made innumerable experiments in the methods of his art. He has worked in tempera, fresco and water-colours as well as in oils, and his stone masks of fauna and satyrs in the Basel Museum are characterised by the power and individuality that belongs to everything his hand has touched. The question as to the durability of his pictures is with him an all-important one. He rubs the colours himself, testing the pigments with chemicals, preparing the canvas with his own hand. The pictures of the Schack Gallery illustrate the value of this attention to detail. Although in some cases more than thirty years old, they look as fresh as though they had just left the easel.

Böcklin has been compared with Burne-Jones, with Rossetti and the French idealists. It will be seen that his range is wider than theirs. In one respect especially he differs from them. All of them have something (some of them not a little) of the morbid sentimentality, the despairing psycho-pathetic tendency of the age. Böcklin alone among the modern idealists possesses the unmodern characteristic of iron health. No better illustration of it could be found than the picture in which he has portrayed himself, like Rembrandt, holding in his hand a glass of wine, plainly in the best of humours with himself and all the world. Everywhere he is absolutely free from sentimentality, full of sanity and sunny cheerfulness, and that old Olympian jollity that seems for the most part to have passed out of the world.

The Schack collection is not rich in portraits. It possesses two, however, which would attract attention even on the most cursory visit. These are the portraits of Count Schack himself, painted by Lenbach. Both are characteristic of the man, who, as the generous and discriminating patron of art, has a wider than European fame, but neither of them pictures him as he was in his old age. He was an old man when he died a few weeks ago in Rome, as for the most part he had lived there during the last years of his life. For some time he had been quite blind, and more and more rarely of late had been able to undertake the journey to and from Munich. When he was there he spent much of his time among his pictures—a grey-haired, noble-looking old man, lingering thoughtfully before one or another of them, as though his physical nearness to them brought back more vividly the remembrance of the beauty of form or glow of colour that had first delighted his artistic sense. It is in connection with his gallery of paintings that Count Schack will be remembered; but it was not as the collector of pictures that he wished to be remembered. With the same curious twist of judgment that made Addison place his poems above the papers in the *Spectator*, that made Hogarth boastful of himself as a "history painter," he had set his heart on literary fame. In a great measure it was denied him, and the want of it left him a little bitter. In his youth he had travelled widely. He had been the friend and biographer of Mazzini, and had known almost all the remarkable men of his time. Wealth and social position enabled him to develop his artistic taste to the utmost. He went from country to country, the guest, as it seemed, of all

times and all peoples, an unconfessed epicurean, his aim self-culture, his delight the description and exposition of the things he had seen in his wanderings.

His lyrics, his "Nights of the Orient," his hymns to civilisation could only have been written by a citizen of the world. His wide culture was the thing most characteristic of him—that and an insatiable appetite for work, that grew at the last to be almost a fanaticism. All his life he was an indefatigable worker. He had written epics and dramas and art histories—histories, amongst others, of "Dramatic Art and Literature in Spain," of "The Poetry and Art of the Arabs in Spain and Sicily." During the last winter of his life he composed poems and sonnets, and translated several Spanish dramas. He died pen in hand, with an unfinished poem on his lips. But work as he would, fame always eluded his grasp. His art had its limitations. Always interesting and powerful when he speaks in his own person, he is invariably weak and colourless when he makes himself the mouthpiece of other individualities. His romances in verse, in which, taking "Don Juan" as his pattern, he himself is the hero, and where no attempt is made to rise above the subjective, are perfect works of art, sparkling everywhere with brilliant satire and graceful flights of fancy. His epics and dramas have scarcely any other charm than that which belongs to a beautiful thought expressed in blameless outward form. As a translator he is at his best; a master of many languages and of their metrical forms, his most valuable contributions to literature are his translations from Spanish and the Oriental languages.

Now, after Count Schack's death, it is pathetic to think of the deep, almost tragic, longing for recognition that possessed him—of his almost childish pleasure when chance, or a letter from some student or lover of art, brought him the knowledge that some one had found pleasure in what he had written, and of his strange unwillingness to accept, as the patron of art and the collector of the "Schack Gallery," the fame which was so justly his due.

ARCHITECTS' FEES IN SYDNEY.

THE following case recently occupied the chief justice, Sir Frederick Darley, and a jury of four, in the Supreme Court of New South Wales. The action was brought by William Pritchard and Arthur Frederick Pritchard, trading as Wm. Pritchard & Son, architects, against Frederick E. Winchcombe, E. J. Turton, C. L. Wallis and Duncan Carson, trading as Winchcombe, Carson & Co., woolbrokers, to recover the sum of 640*l.* 9*s.*, claimed to be due to the plaintiffs as commission, &c., for work done for the defendants in preparing plans for wool stores. The defendants paid into court the sum of 168*l.* 6*s.* 3*d.* as sufficient to satisfy the plaintiffs' claim, and with their pleas set out particulars showing payments to plaintiffs from July to December, 1893, to the total amount of 370*l.* 9*s.*

The plaintiffs' case was that in January, 1893, William Pritchard, the senior member of the plaintiffs' firm, had an interview with Mr. Winchcombe, who informed him that his firm contemplated erecting a large wool warehouse, and that having known Mr. Pritchard previously in connection with the erection of Goldsbrough, Mort & Co.'s stores at Darling Harbour and Circular Quay and other large buildings, he wished him to look out for a suitable site for the purpose. Plaintiffs accordingly made the necessary inquiries and defendants, first of all, selected a site at Pyrmont upon which they thought of erecting a building four storeys high. Plaintiffs prepared plans and drawings for this building, but the idea was abandoned, and plaintiffs subsequently inspected some land at Wattle Street, Ultimo, and reported to defendants, who decided to erect the building upon that site. The defendants made fresh plans and drawings, and after some delay the defendants determined for the present to erect only the central portion of the stores, leaving the wings to be added afterwards. The central building was completed on the plans furnished by plaintiffs, and "fish-plates" and "toothing" were left, so that the wings could be solidly dovetailed to the main structure when the additional work was determined upon. This was about November or December, 1893, and in January of the present year the plaintiffs, having noticed that defendants had advertised for prize designs for additions to their wool stores at Wattle Street, wrote to the defendants with reference to the matter, stating among other things, "We were certainly very much surprised at this, not having received the slightest intimation from you either that you were dissatisfied with our carrying out of the centre portion of our approved design, or of your intention to abandon the design already prepared by us and approved of by yourselves and by the City Council, and copies of which were and are still deposited in the city surveyor's office as guarantee of your intention to complete the building according to that design. On this understanding you were allowed in the meantime to enclose the centre por-

tion, which you wished first to erect, with temporary side walls of galvanised iron." In reply to this letter the defendants wrote:—"You are under a peculiar misapprehension regarding our building. We never approved or even asked for any plans from you other than those of the building which you carried out. There is no occasion for you to interview Mr. Winchcombe unless it is as probable submitters of a competitive design for our further building." The plaintiffs subsequently instituted the present action, the principal items of the claim being as follow:—"Receiving instructions to make estimate for a building on portion of lands for sale by Peyton, Dowling & Co., in Pyrmont Street, Pyrmont; taking levels, making sketch plans and detailed estimate for a building, 264 feet long by 115 feet wide, four floors in height, estimated cost 22,576*l.*, with estimated cost of additional storey 3,000*l.*, and hydraulic lifts 250*l.*; total, about 26,000*l.*—1 per cent. on estimate, 260*l.*; to receiving instructions to prepare plans for building, 400 feet by 300 feet, on land, Wattle Street, Ultimo, with estimate of same; inspecting site, taking levels, preparing plans, elevations and sections; and estimate of the said work, 20,000*l.*—1½ per cent., 300*l.*"

The plaintiffs' case having closed, the defendant, F. E. Winchcombe, gave evidence that he never gave the plaintiff, W. Pritchard, any instructions to look out for a suitable site for a store. He was continually calling and asking witness when the firm were going to build a store, and upon one occasion Pritchard submitted a memorandum containing the descriptions of a number of blocks of land, and he specially mentioned Peyton Dowling's land at Pyrmont Street, Pyrmont. Being a little bit impatient with his persistence in the matter, witness asked him what it would cost to put a building of four storeys on the land, expecting to get a reply there and then. Pritchard said he would let him know, and witness told him to give him a rough idea; but he gave no instructions to make estimates or to go out to the land and take levels. Indeed he did not know that levels would be required, and when he asked Pritchard to give him a rough idea of the cost he did so in order to choke him off, as he was so persistent in the matter. Next morning he called with the estimate, and witness told him it was out of the question. He never told Pritchard, as he had stated, the matter was one of urgency, so that they might be in time for the wool season, and he did not give him instructions to prepare plans of a building or to do any of the work charged for under the claim of 260*l.* When witness secured the land at Wattle Street, Ultimo, he stated the fact to Pritchard, who shortly afterwards brought him a sketch-plan embodying the ideas witness had conveyed to Pritchard in the course of various conversations. When he saw the plan he was pleased with it, and asked Pritchard to leave it. Pritchard said that a building like that would cost about 20,000*l.* Subsequently he called upon Pritchard formally with reference to the matter, and told him that he intended to build on 100 feet of the land, which had a frontage of 400 feet. Pritchard was instructed to prepare plans of a building covering 100 feet of the land, and so designed that wings could, if necessary, be added at some future time; but he never told Pritchard at any time to prepare plans of a complete building at a cost of 20,000*l.* The lease of the stores which defendants occupied would not be up for two years, and he told plaintiff it was not probable that the firm would complete the whole building for some years. When plaintiff sent in his estimate and plans for the central building, the amount stated was 8,935*l.*, and as defendant did not contemplate then going into a larger expenditure than 6,000*l.*, he went through the plans with plaintiff and made certain alterations, which reduced the amount. The wing to the building which the defendants were now proceeding with was not based upon plaintiff's design at all, and witness had not seen plaintiff's plans of the wings since they were first shown to him.

Counsel having addressed the court, his honour summed up, and the jury, after two hours' deliberation, intimated that they were prepared to give a verdict by majority. This was accepted by the parties, and was in favour of the plaintiff in the sum of 50*l.* above the amount paid into court.

The *Australasian Builder*, in commenting on the case, says:—"The result of the action, Pritchard and Another *v.* Whitcombe and Others, can scarcely be regarded as satisfactory. The circumstances connected with the affair, as given by Mr. William Pritchard, are so simple and straightforward that it is difficult to imagine any reasonable person coming to any other conclusion than that the right to the claim was fully made out. We, of course, look at the question from a professional point of view, but it is an unfortunate fact that, not only in the colonies but in Great Britain, both judges and juries have generally shown a tendency to regard an architect as, *prima facie*, a rogue. The late Lord Chief Justice of England, Lord Coleridge, on several occasions gave rulings which clearly showed his prejudice against the profession, and in the Sydney case now under review, Sir Frederick Darley, in his summing-up, exhibited something of the same tendency. The one consola-

tion we experience in regard to the verdict is that it will serve in some degree to show that clients cannot be allowed to throw over an architect just as it pleases them—an idea which seems to be very prevalent in these days.

TESSERÆ.

Decay in Cement.

THE primary cause of the premature decay which takes place in stuccoes and cements when used externally as a coating to walls is the presence of muddy earth and decayed animal and vegetable matter in the sand used with the lime and cement. To this may be added frequent impurities in the limes and cements themselves, particularly of argillaceous matter in the former, and sometimes to the too great proportions of lime or cement to sand. These things might, however, remain quiescent for a long time if the work were well protected from access of moisture, which is the grand exciting cause. The paint or distemper wash on the surface is generally sufficient to prevent the rain which may beat against a vertical face from penetrating, especially if the work have been well hand-floated and trowelled, to make it close and compact; but the evil arises from exposure above, and from the numberless horizontal unfloated surfaces which are constantly presented. These receive and collect the water, and convey in streams over the vertical surfaces what is not immediately absorbed, and the work thus becoming saturated, frost seizes and bursts it, or warmth calls the vegetative powers of the impurities in it into action, and the whole is covered with a green sward. Let the sand of which a plaster composition is to be formed, whether with lime or cement, be washed until it no longer discolours clean water, and be well compounded with cementitious matter free from the impurities with which it is so frequently charged; let the work be well hand-floated and trowelled, particularly on the backs or upper horizontal surfaces of projections, and protected above by projecting eaves or otherwise, and the work, with common care and attention to paint or distemper at intervals, will last as long as anything of the kind can be expected or is found to last anywhere.

The Picturesque in Greece.

Though the absence of picturesque descriptions of landscape forms a characteristic feature of Greek literature in its better periods, still there are in almost all writers either detailed passages or at least epithets and allusions from which the prevailing taste may be partially gathered. Now one of the first things that strikes us in all such is the utilitarian character of the Greek notions of scenery. From Homer to Theocritus may be traced the same principle lying at the bottom of their expressions in reference to nature, that only those objects are agreeable, and therefore by association beautiful, which minister directly to man's comfort or sensual enjoyment; objects which stand in his way and bring discomfort, inconvenience or danger are ugly and dreadful. Thus the shady or fruitful tree, the cool water, the fertile plain, the calm sea on which "go the ships," the clear bright sky, whether by day or night, are delightful and lovely; the rain, the thunder-cloud, the tempest, the precipice, the torrent, the glacier, suggest no emotions but alarm or horror. The Greeks were an eminently practical and also a highly sensual people, and both these tendencies contributed to this peculiarity of taste or want of it, as we are accustomed to say. They could see no reason for admiring a rock which was rough and hard to climb, and interposed an obstacle to the journey between Megara and Corinth, or in the lightning which blasted the oak, or in the stormy sea which engulfed their corn ships or triremes; they liked to see before them deep crops and rich pastures, vines, figs and olives; the stream whose gentle murmur invited to repose, and the grassy bank and plane tree, with its thick shade and fragrant flowers, which seconded the invitation—objects which either regaled their senses or suggested images of affluence and enjoyment. And as they were totally devoid of cant, affectation and sentimentalism, what they really loved they talked and wrote about, and never dreamed that they were under any obligation to express admiration and enthusiasm which they did not feel, merely in compliance with the prevailing fashion of the day.

The Fine Arts and Utility.

The great use of the arts is to humanise and refine, to purify enjoyment, and, when duly appreciated, to connect the perception of physical beauty with that of moral excellence, but it will at once be seen that this idea of usefulness is in a great measure distinct from the ordinary meaning of the term as applicable to the productions of human ingenuity. A positive use results, indeed, directly from the cultivation of the formative arts, precisely in proportion as their highest powers are developed, for it will be found that at all times when the

grandest style of design has been practised with success, and particularly when the human figure has been duly studied, the taste thus acquired from the source of the beautiful has gradually influenced all kinds of manufactures. Again, as illustrating science, the fine arts may be directly useful in the stricter sense, but this is not the application which best displays their nature and value. The essence of the fine arts, in short, begins where utility in its narrower acceptation ends. The abstract character of ornament is to be useless. That this principle exists in nature we immediately feel in calling to mind the merely beautiful appearances of the visible world, and particularly the colours of flowers. In every case in nature, where fitness or utility can be traced, the characteristic quality or relative beauty of the object is found to be identified with that fitness—a union imitated as far as possible in the less decorative parts of architecture, furniture, &c., but where no utility save that of conveying delight (perhaps the highest of all) exists, we recognise the principle of absolute beauty. The fine arts in general may be considered the human reproduction of this principle. The question of their utility therefore resolves itself into the inquiry as to the intention of the beauties of nature. The agreeable facts of the external world have not only the general effect of adding a charm to existence, but they appeal to those susceptibilities which are peculiarly human, and it becomes necessary to separate the instinctive feelings which we possess in common with the rest of the creation from that undefinable union of sensibility and reflection which constitutes taste, and which, while it enlists the imagination as the auxiliary of beauty, is in its highest influence less allied to love than admiration. It is this last feeling which the noblest efforts of the arts aspire to kindle, which not only elevates the beautiful, but reduces ideas of fear and danger to the lofty sentiment of the sublime, which, as its objects become worthier, is the link between matter and mind, and which tends to ennoble sympathy and increase self-respect.

Arts Among the Aztecs.

The Aztecs had made some progress in the arts of social life. The monuments of architecture, sculpture and painting which still exist, though very far behind that degree of perfection which these arts had obtained among some of the nations of the old continent, are not devoid of merit. The Aztec painters had no knowledge of perspective nor of light and shade. Their designs are coarse and uncouth; their figures are fantastical and only drawn in profile; but they are remarkable for the brilliancy and durability of their colours. In these paintings the lands of the king were painted red, those of the nobility scarlet and those of the people light yellow. Their works of architecture and sculpture evince a far superior degree of excellence. The Aztecs were also acquainted with the art of casting in metal figures of natural objects. Their mosaic, or rather works of embroidery, were admirable. The method they adopted was to glue feathers of different colours upon a piece of canvas, and then place it upon a tablet of wood or a plate of copper. They laid the feathers so even and matched the colours so admirably as to give to objects thus represented the appearance of painting. Another work, which might with greater propriety be called mosaic, they made with pieces of shells of different colours. This work was done by separate artificers, every one of whom undertook a certain part of it, and then another artist arranged the different parts together, so as to complete the performance. The houses of the poor were made of reeds or of unbaked brick, and were roofed with a certain species of grass, upon which they placed leaves of the aloe cut in the shape of tiles. They had but one apartment, where all lived together. The houses of the citizens had besides an *ajauhcalli*, or oratory, and a *temazcalli*, or bath. The nobles had their houses built with stone and mortar, and consisted of two storeys, covered with a flat roof or terrace. The stone most commonly used for building was the *tetzontli*, a red stone, very hard and porous.

Early Norman Castles.

Our Saxon ancestors reared few places of strength. Their habits were peaceful and agricultural rather than warlike, and they lived, as William of Malmesbury informs us, in low and mean houses, having no pretensions either to splendour or strength. This defenceless condition of the island rendered it so easy a prey to the Norman conqueror. And it was to remedy this defect and secure his newly-acquired dominions, as well against invasions from without as rebellions within, that William lost no time in erecting strong castles in all the principal towns of his kingdom, as at Lincoln, Norwich, Rochester, &c., for the double purpose, as we are told by Stow, "of strengthening the towns and keeping the citizens in awe." His followers, among whom he had parcelled out the lands of the English, had likewise to protect themselves against the resentment of those they had despoiled, and imitated their master's example by building castles on their estates. The turbulent and unsettled state of the kingdom during the succeeding reigns caused the rapid multiplication of these strongholds, until, in

the latter end of the reign of Stephen, there are said to have been no fewer than 1,115 castles completed in England alone. "The whole kingdom," says the author of the Saxon Chronicle, "was covered with them, and the poor people worn out with the forced labour of their erection." It was soon found also that they were likely to be no less inconvenient to the sovereign, enabling a cabal of barons to beard the power of their liege lord; and one of the first acts of Henry II. was to prohibit the erection of any castles without a license. Some of these are extant. The oldest known is that granted by Richard II. to Richard Lord Scrope, his chancellor, for the building of Bolton Castle. It is styled in the document "*Licentia batellare, kernellare (crenellare), et machicolare.*" Many of the castles of this age were of great size, and possessed a certain rude grandeur of design. To the single keep-tower of earlier date several other towers, both round and square, were added, united by flanking walls, so as to enclose a polygonal courtyard, the entrance to which was usually between two strong contiguous towers. An outwork, called the barbican, often still further defended the approach, as well as a moat and draw-bridge. Plates of iron covered the massive doors, in front of which the grated portcullis was let down through deep grooves in the stonework; and overhead projected a parapet resting on corbels, between which were the openings called machicolations, from which melted lead, hot water and stones could be thrown on the heads of the assailants who should attempt an entrance by forcing, or, as was the usual mode of attack, firing the doors. The gateways of Caerlaverock, Tunbridge, Conway, Carisbrook and Carnarvon are good specimens of this kind. The keep-tower or stronghold rose pre-eminent above the rest, and generally from an artificial mount. It contained the well, without which the garrison would not have been enabled to hold out in this their last place of refuge; the donjon or subterranean prison, the name of which was often extended to the whole keep; and several storeys of apartments which were probably not occupied by any but retainers, except during a time of siege. The staircase which communicated with these storeys was either pierced in the thickness of the walls or built on the outside of the tower.

Elizabethan Mansions.

When the intercourse between the different states of Europe had become considerable the fame of the Italian architects was a subject of deep interest in this country, where the rage for building was no less strong and general than in Italy. In the brilliant reign of Elizabeth the English nobles and princely proprietors vied more than ever with each other in the magnificence of their mansions. It might have been supposed that the noble Tudor houses, with their panelled walls, buttresses and battlements, traceried windows, sculptured dripstones, florid pinnacles and embossed chimney-shafts, were sufficiently rich and gorgeous to satisfy the prevailing taste for splendour; but in their anxiety to strike and surprise the admiration of their countrymen many deserted the native styles and sought for designs and even artists from abroad. Italian architecture became by degrees the mode, and even where the indigenous style was adhered to in the general design, many of the enrichments and ornamental features were borrowed from the Italian. First of all the porch or gateway, as the most conspicuous points on which to exhibit these exotic novelties, were decorated on either side the entrance, and perhaps a second and third storey above with pilasters, belonging to the different Greek orders; the doorway itself exchanged the low Pointed or Tudor for the circular arch—the deep, elegant and sweeping Gothic mouldings for the Vitruvian architrave, cut across by the awkward projecting imposts. The porch of Milton Abbey, built in the reign of Henry VIII., is one of the earliest examples of this innovation. Lower Marney Hall, in Essex, built in the same reign, is another. In plan it is a regular embattled quadrangular mansion, built entirely of brick. The gate-tower is flanked by large and lofty octagonal turrets with narrow pointed windows, but topped with lotus-leaf ornaments and scrolls instead of battlements, while the mullions of the large windows terminate above in debased Ionic capitals; all these enrichments are moulded in brick. Next was introduced the cupola whose invention in Italy had made so much noise that it appears our country squires were anxious to have miniature specimens of it at home. It was applied as a covering to the high turrets, round, square or polygonal, which flanked the entrance or terminated the angles of the building, and surmounted with gilded vanes certainly produced a rich and imposing effect, as we experience in Burleigh and Cobham. The parapet over the porch and the projecting windows was at the same time exchanged for the pediment, and busts of the twelve Cæsars and similar devices took the place of the ancient heraldic animals and shields. Then followed the removal of the panelled battlements and the substitution of a parapet carved into fantastic notches or scrolls, or perforated with oval openings and ornamented with obelisks, balls, busts, statues and other singular decorations.

These ran up the gables, which were often twisted into strange shapes, and sometimes wholly replaced by the level balustrade. And thus the most characteristic features of the old style, its numerous steep gables and spiry pinnacles, were succeeded by the uniform horizontal straight lines of the new. At length the whole building was surrounded by columns or pilasters, rising tier above tier to the exhaustion sometimes of the four orders—open arcades took the place of the entrance porch—and nothing remained of the Tudor style but the mullioned window, which, however, was of itself sufficient to give a peculiarly picturesque and old-fashioned aspect to the whole building.

The Bezant in England.

Camden, noticing the coined and other money in use among the Saxons, says:—"Gold they had also, which was not of their own coin, but outlandish, which they called in Latin Bizantini, as coined at Constantinople, sometimes called Bizantium, and not at Besançon in Burgundy. This coin is not now known, but Dunstan, Archbishop of Canterbury (as it is in the authentic deed), purchased Hendon in Middlesex of King Edgar to Westminster for two hundred Bizantines. Of what value they were was utterly forgotten in the time of King Edward III.; for whereas the Bishop of Norwich was condemned to pay a Bizantine of gold to the abbot of St. Edmundsbury for encroaching upon his liberty (as it was enacted by Parliament in the time of the Conqueror), no man then living could tell how much that was, so as it was referred to the king to rate how much he should pay." In Domesday Book no mention whatever occurs of the Bezant; but it occurs twice as a denomination of money in the Winton Domesday of the year 1148, and several times in the Boldon Book, a survey of the palatinate of Durham made in 1183, both printed among the Supplementary Records to the Great Domesday. The monks of Oseney, in consideration of the manor of Hampton-Gay in Oxfordshire, in the 6th of King Stephen, gave ten marks of silver to Robert de Gait, and one bezantine to his wife. Madox says that in Henry II.'s time Cressalin, the Jew of Winchester, was amerced one hundred marks, and he paid, instead thereof, one hundred bezants, which were accepted by the king, *mera gratia*. Madox also says that in the 17th year of King John, 10s. of Venetian money and two bezants were used at the Exchequer for counters, the Venetian shillings valued at 15s. and the two bezants at 3s. 6d. There of course were silver bezants. From the narrative of William de Braose's treasons (recorded in the Black and Red Book of the Exchequer) against King John, it is clear that silver bezants were in use in that reign; for when Maud, Braose's wife, was to make the first payment of a fine of 40,000 marks, which she and her husband had consented to pay on being restored to the king's favour, she told the justiciary and the rest who were sent to distrain upon their goods that they must expect nothing, she having no more money in her purse than twenty-four marks silver, twenty-four shillings of bezants, and fifteen ounces of gold. John of Glaston in his "Chronicle" informs us that Michael, abbot of Glastonbury, dying A.D. 1253, left to his successor "quadraginta Bisancios et viginti libras sterlingorum." Chaucer names the "Besaunt" in the "Romaunt of the Rose," and Wicliffe, in his translation of the New Testament, uses the term "besauntis" for the ten pieces of money in the parable. The probability seems to be that the bezant of gold was current in England, if not from the ninth, certainly from the tenth century till the time of Edward III., when the coinage of the English noble drove it out of use.

The Nude in Art.

To make the display of the nude an essential of high art is approximating the absurd, as it amounts, except on rare occasions, to rendering high art impossible. In accordance with this view, the elevated and the beautiful can seldom be united with the probable, for how few passages in history will admit of the introduction of the naked figure, and yet how vast is the field of history wherein to display the moral and the beautiful. The skilful arrangement of drapery involves as much taste and judgment as the proper management of the nude, and the draped figure may be represented as beautiful and as dignified as the undraped. A skilful arrangement of drapery does not consist in displaying the exact form of the nude, as if the drapery were a wet sheet or blown against the person by the wind, but in showing the exact position and proportion of the covered, though not concealed parts. Raphael seldom painted the naked form, yet his figures are pre-eminently distinguished for dignity of character, and this is not owing to any display of the nude beneath the drapery, but to the position of the figures themselves, and the just arrangement of the folds of their draperies. This hankering after the nude is one of the morbid symptoms of the taste of that period. With what success such a display is made may be seen in some of the monuments in St. Paul's and in Westminster Abbey. A well-draped figure implies a thorough understanding of the nude in the artist.

NOTES AND COMMENTS.

HENCEFORTH all the operations of picture restoration will be carried out at South Kensington, and the risks of damage to which paintings were liable when they were sent from the Museum to other premises will be obviated. Mr. ARMSTRONG has been able to have the oil-paintings examined. Most of them were found to be well preserved, but in those on which bitumen was used as a pigment there are cracks through which the ground can be seen, forming a series of white lines. In such cases the lines have been tinted with tempera colours like the adjacent sound parts, but the cracks are never filled up or concealed. In many cases it was found desirable to remove the accumulated coats of varnish which, in course of years, had obscured the original freshness of the paint. This removal was always effected by chafing, no solvent being used. Where it was found that copal varnish, or some substance which would not give way to the friction of fingers, and also where there was reasonable ground for expectation that old restoration would be found between or beneath the coats of varnish, nothing but the removal of dust or surface dirt was attempted. An experiment with a landscape by G. BARRETT deserves mention. It was so brown as to resemble a work in sepia, while now it shows all the delicate freshness of BARRETT'S best water-colour work. When the varnish was in process of removal it was decided to leave untouched a small portion of the sky, about 6 inches square, so that after every other part had been effectually cleared, the contrast between the original colour of the paint, as brought to light, and its former aspect when seen through the dark and yellow mastic, might be fairly judged. While this square of brown varnish remained a photograph was taken of the picture. Captain ABNEY then employed his system of chromometry to gauge the colour within the square and that of the adjacent parts of the sky from which the varnish had been removed. The colour of each portion can at any time be therefore exactly reproduced on a screen from certain rays of the spectrum of the electric light combined in definite proportions. Such a scientifically accurate record of the colour of pictures has never been achieved before. No repainting with the object of concealing damage has been attempted in these processes. In a few instances previous restorations, which in course of time have become obvious and offensive and which would have been dangerous to remove, have been hidden or made less apparent by the use of tempera colour applied over a thin coat of mastic varnish and covered and secured by another. This can at any time be easily removed without danger, and each case has been noted in a book kept in the Museum, where every process of lining, cleaning or repairing is carefully recorded.

By a new rule of the Department of Science and Art the total of the building grants made in any one year will not exceed 10,000*l*. The regulations for schools continue unchanged, and are as follows:—The rooms for study should be not less than 15 feet high to the wall-plate, if ceiled flat, or 12 feet high to the wall-plate if ceiled to the collar-beams or the common rafter. The windows should be large, and in art schools free from mullions or small panes. The classrooms should, as far as possible, communicate with each other directly as well as by passages. When there are more storeys than one, the staircase should give access to all rooms without passing through rooms; also to cloak-rooms, lavatories, &c. The arrangements for lighting with gas, for warming, drainage, &c., should be complete. The rooms should be well ventilated by the admission of air below the gas-lights, and by the extraction of vitiated air by means of shafts carried up above the roof. Water-closets, urinals and a lavatory must be provided; the accommodation for female students must be separate. The external walls of the school, if of brick, should not be less than one brick and a half in thickness, and if of stone, not less than 20 inches in thickness. All the roofs must be either tiled or slated. Gutters and drains to carry away the roof-water must be provided. If the roof be unceiled to the tie-beam or collar-beam, there must be ceiling to the rafters. Rooms which are top-lighted should in all cases be ceiled to the common rafters in order to give increased height; and all tie-beams or other heavy roof-timbering should be avoided, and iron tie-rods used where practicable.

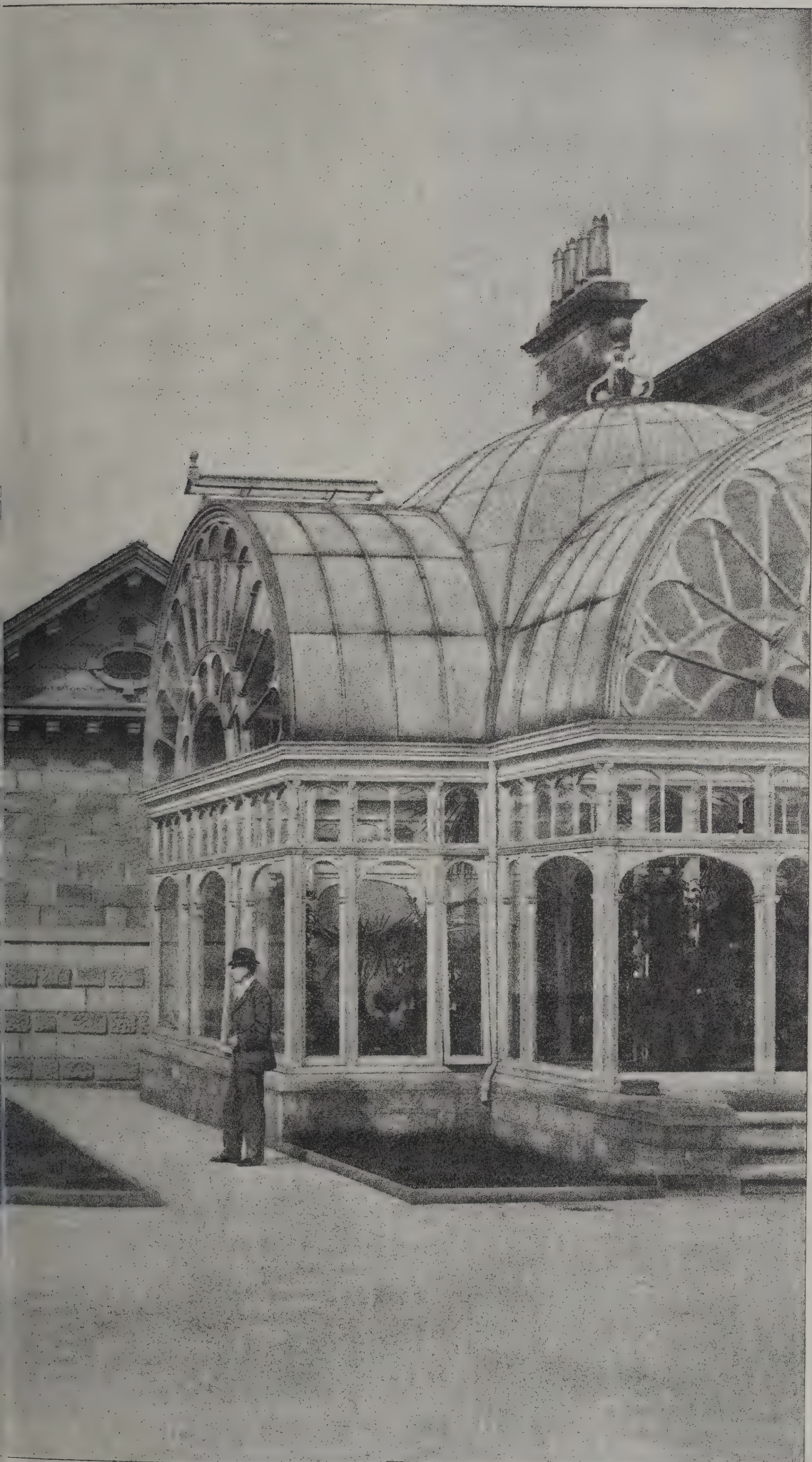
No grant will be given for a school of science unless there be a room properly constructed and fitted up for lectures on experimental science, and at least one room properly arranged as a laboratory for practical work in one or more subjects of science. For a school of art the following dimensions are considered to afford adequate provision for fifty students. Proportionately increased accommodation must be provided for greater numbers. One elementary room, 20 by 30 feet. This room should be not less than 16 feet high, and may be lighted by skylights as well as by side windows. One room for study from life or life-size casts, not less than 20 by 24 feet. This room should be lighted from the north side by a single large window, the top of which (carried up in a dormer if necessary) should be at a height above the floor equal to three-quarters the depth of the room, or if the pitch of the roof be steeper than 60 degrees, a skylight should be made in continuation of the windows, so as to gain the same effect in lighting. One modelling room, 20 by 15 feet. One master's room, 12 by 15 feet. This room should be lighted by a side light from the north if possible. One cloak-room for females, 12 by 8 feet 6 inches. A kitchen and bedroom for the attendant, each 12 by 10 feet.

On September 4 Mr. A. N. PATERSON, M.A., the president of the Glasgow Architectural Association, will deliver his address. In the course of the session the following lectures and papers will be read at the meetings:—"Art Metalwork," by Mr. GEORGE ADAM; "Planning of Country Houses," by Mr. WM. FRASER; "The Abbeys and Cathedrals of Scotland," by Mr. P. M'GREGOR CHALMERS, F.S.A., Scot.; "On Tramp," by Mr. J. KENNEDY HUNTER; "Planning of Farmhouses," by Mr. CHAS. J. DAVIDSON; "The Thirteenth and Fourteenth Centuries in Italy," by Mr. T. L. WATSON; "Monumental Buildings," by Mr. W. J. BLAINE; "An Architectural Chat," by Mr. J. A. MORRIS; "The Development of School Planning," by Mr. R. W. HORN; "The Monks and their Abbeys," by Mr. S. HENBEST CAPPER, M.A.; "The Early Development of the Christian Church," by Mr. W. J. ANDERSON; "The Work and Influence of the ADAMS in Scotland," by Mr. JOHN WHITE; "Decorated Gothic," by Mr. DAVID B. DOBSON. The subject selected for the competition for the travelling studentship is a village institute, comprising a large hall to seat 800 and a small hall to seat 200, with committee-rooms, library, small museum and caretaker's house. According to the last report the Association consists of 16 honorary, 70 ordinary and 20 corresponding members. It may now claim to be fairly representative of the junior members of the profession in Glasgow.

Of late years changes of diocesan boundaries are not unknown in England. In Mediaeval times, when there were no Ordnance maps on which dioceses could be distinctly laid down, a good deal of confusion used to arise. We lately described one case, viz., the county of Westmorland, which although in England was supposed to be subject to the Bishop of Glasgow. A paper which was read by Mr. S. W. KERSHAW, F.S.A., before the British Archaeological Association on "Winchester and the Channel Islands" contains much curious information about dioceses. It is shown that Lincoln extended to the border of Middlesex, while Reading, Newbury and Windsor formed part of Salisbury. Few may be aware that there was also a see of Ramsbury, which comprised parts of Wilts and Berks. The Channel Islands at one time formed part of the diocese of Dol, afterwards they came under the jurisdiction of the Bishop of Coutances. At the end of the fifteenth century they were in Salisbury, and about the same time Calais was annexed to Canterbury. In 1568 the Channel Islands were transferred to Winchester. Their history would appear to have interest for all who can enjoy ecclesiastical squabbles, for, says Mr. KERSHAW, "the existence side by side of the English with that of the foreign Reformed Church forms a striking episode in these ecclesiastical annals, and called into play many incidents which disclosed more fully political undercurrents and the complexity of State correspondence." But neither church appears to have cared much about architecture. Mr. KERSHAW'S paper must have required arduous labour, but he has succeeded in revealing much which hitherto was obscure.



"WHEATFIELD LODGE," HENRY
T. BUTLER WILSON



INK-PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

7, YORKS: THE STABLES.
A., Architect.



"WHEATFIELD LODGE,"
T. BUTLER

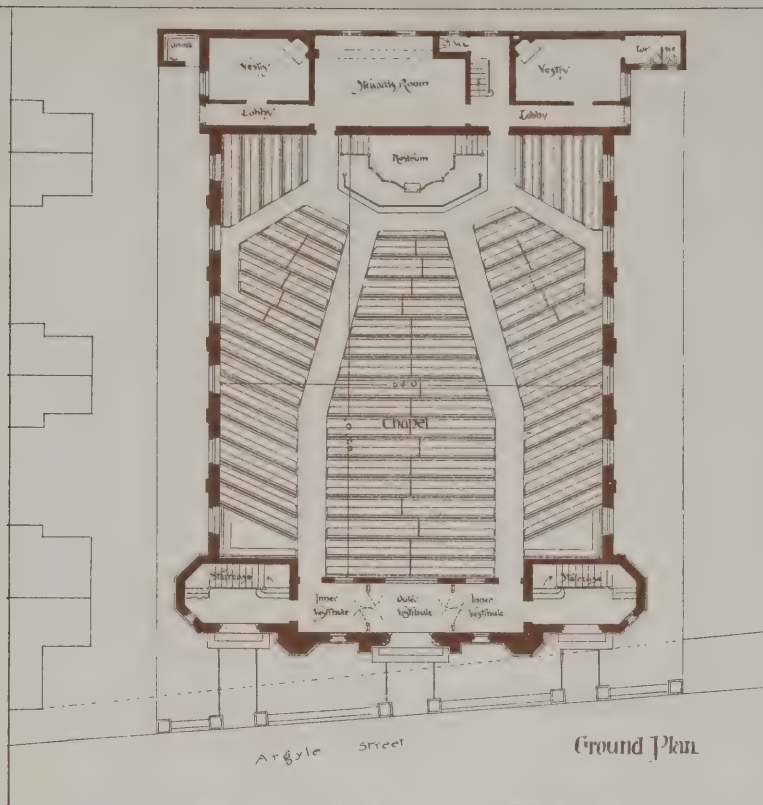


INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

LEY, YORKS: THE GALLERY.
R.I.B.A., Architect.



NEW WESLEYAN CH.
W. ALFRED CL.



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ILLUSTRATIONS.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE GALLERY.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE STABLES.

NEW WESLEYAN CHAPEL, ARGYLE STREET, HULL.

THIS building, which is now in course of erection on a site in Argyle Street, Hull, is in the Waltham Street Circuit. The chapel is designed in a free Romanesque style, and will be built of bricks, faced with Lincolnshire red facing bricks, with dressings in Howley Park and Ancaster stone. The turrets will be framed in oak covered with lead, and the windows will be glazed with leaded lights. The ground floor will fall 18 inches towards rostrum. The pewing and all inside joiners' work will be in redwood, stained slightly and varnished. The ceiling will be in plaster, with modelled plaster panels, and coved on wall sides.

Accommodation will be provided in the chapel for nearly 1,000 people, with vestries, &c., at the rear, the total cost being about 3,300*l.*, exclusive of land. The work is being carried out by Mr. DAVID ROBINSON, builder, Freehold Street, Hull, under the supervision of the architect, Mr. W. ALFRED GELDER, F.R.I.B.A., of Hull. Mr. JABEZ THOMPSON, of Northwich, is supplying the moulded brick and terra-cotta.

SURGERY AND ART.

A REMARKABLE address on the relation between surgery and art was given by Professor J. Greig Smith at the meeting of the British Association of Medicine in Bristol. He said that amongst the arts and crafts the surgical stands alone in the extraordinary breadth of its foundations on science. The painter is not expected to know chemistry, botany, geometry and optics, which intimately relate to his art; nor is the sculptor supposed to be familiar with geology because he works in clay and marble. To the surgeon wide scientific knowledge is of prime importance. Something of all the sciences, a good deal of a few, and everything of two or three he must know. It was a brave display, but, he asked, is it all genuine? In the claims of the science there was a real danger that it might lose something of its art. And it was a pity that science so often killed art. Science and art should flourish together, and certainly it was so in surgery. The art of the surgeon may be viewed from two aspects. The one was allied to the art of workers in wood and iron. It was mechanical. He would place the surgeon's tools on the level of the sculptor's spatula or chisel. But the surgeon is more than a mechanic. He has work to do which brings him to the level of the true artist. The other side he compared to that which produces works of art, and this side was by far the most important. Here the work of the fingers was of small moment as compared with the work of the brain. The brain is supreme, and yet in delicacy, deftness and general preciseness of obedience to the brain's behests, the fingers and hands have great calls made on them. In painting, music or sculpture, mere manual dexterity rarely is deficient to him who has the artistic soul, or if there is, practice and education will do much to remove it. So in surgery, the hands rarely fail to rise to the demand that the brain makes upon them—if they are trained in the highest part of the surgical art—"Brain's craft" uttered through the fingers. It is not mere manual dexterity or cunning. The surgeon's art demanded breadth and variety in manual training. The highest cultivation of the sense of touch is essential to the surgeon. The sense of touch is trained through the intellect as much as through the fingers. Those who bring the sense of sight to help out the impressions of touch ought to surpass the blind in tactile power. There are no limits to the demands made in the surgeon's tactile powers. Touch is to the surgeon what hearing is to the physician, but always it is the intellect which interprets. Amongst the plastic arts sculpture perhaps gave most points for comparison with the surgical. The surgeon artist forms a clear conception of the work he has to do—makes straight for the ending of it between detail and bulk. He determinedly keeps a true artistic proportion. The finest work of the surgeon makes demand on the delicacy of the fingers little, if anything, less exacting than that made on the fingers of the etcher or the line engraver. The demand made on the hand, the eye and the brain was the same for surgery as for the fine arts. Of this art of surgery where and what is the teaching? There is no real teaching of this art in our country. Surgeons had to teach themselves by practical experience. Surgeons alone had, unassisted, to grope their way to excellence in their art. The

art can be taught in only one way of teaching. In all the plastic arts the young artist must have a master at his elbow—a master who will criticise his methods and correct them; who will guide him in the use of hand, eye and instruments; who will lead him step by step to such excellence in the art as he himself has acquired. If, then, the art of surgery is to be properly taught, it must be taught to the young surgeon actually operating. But that is only possible after the surgeon has become qualified legally. He thought that the young surgeon ought not to object to such tuition and criticism from a master. He could conceive no finer ending to a great surgeon's career than to devote it to the education in his art of the men who are to succeed him. He has handed his legacy of science to all mankind, and his art would survive in the hands of the pupil he has trained. He did not say how this was to be attained. We might ask, he said, to be put on the level of the fine arts and seek for a Royal Academy of Surgeons. To such an academy a school with teachers would be attached. The teachers would be those supreme in surgical art; the pupils, men already qualified, who sought for practice in the higher walks of surgery. Art thrives on appreciation. There is no academy to bestow gold medals on the surgical artist. No crowds gather round to admire his finished work. His science may be trumpeted far and wide. His art is known to his own small circle. It has little recognition beyond, and we let it die with him. The art of the surgeon has its best reward in blessings, not in fame.

EARLY ROAD-MAKING IN ENGLAND.

A PAPER was read at the meeting of the British Archaeological Association by Dr. J. S. Phené on "The Early Occupants of the Vicinity of the Mersey, Morecambe Bay and Manchester." When Whitaker wrote his history of Manchester it was said he laid the real foundation-stone of British archaeology, the grand *coup* being the proving, through their names and style of execution, that the roads of Britain were of pre-Roman formation. Dr. Phené avowed that the pre-Roman occupation of Britain was a commercial and hence a civilised one. After giving a description of the peculiar features of the roads, he sought to show that the pre-Roman roads of ancient Italy bore exactly the same peculiar features as the early roads of Britain; and, following this up, he gave a great variety of evidences showing a close commercial intercourse between Britain and Italy in pre-Roman times. His own surveys, studies and observations had been made without any knowledge that others had been, or were still, working in the same direction. But he was now in possession of the researches of others, which entirely supported the conclusions he had come to as to an early occupation of Britain by foreign communities who resorted here for trade purposes. He was able to show in the locality he selected evidences of two distinct Italian tribes, the Vennones and the Senones, located in Britain long prior to the Roman Conquest. These points were quite sufficient to suggest Italian occupation of a very early date and to account for the formation of roads in Britain which might thus be correctly called Italian roads. The settlements on the Mersey and Morecambe Bay (meaning "the great winding"), which, supplemented by the Great Orme's Head, formed the great winding Serpent's Head; the Lesser Orme's Head, Ormskirk, the Serpent's Temple, and other names showed the location of foreign people having a mythology common to Scandinavia and to Etruria. These Italian colonies had their *entrepôts* of commerce always at the intersection of the ancient roads, as at High Cross, where the Vennones held their stronghold in the forest of Arden unmolested by the Romans; also at the two crosses cut in the chalk cliffs near Risborough; also at the junctions of branch roads, as at Winchester and in the localities of the other great figures in the chalk. Vast figures of the serpent and the dragon were found in Latium and in Etruria, where these tribes had originally been—hence it was probable that, as the roads and ways appeared scientifically constructed on the old Italian style, these figures, in every case in the vicinity of such roads, were by the same people. The flint and bronze implements found at Holyhead and in Sussex agreed in design in many particulars. The word Arden followed the course of these people through the Continent to Rome; it was always applied to vast woods by which they located, and was clearly the old Italian word *ardente* (burning), thus revealing their traffic by smelting, and near these places crucibles had been discovered.

The Town Council of Aberdeen have renewed a grant of 100*l.* from the Corporation funds towards the support of the Art Gallery. It was stipulated, however, that during at least six months of the year the gallery should be open to the public on payment of a small charge for admission, and that, as regards the remainder of the year, the gallery should be at the disposal of the art gallery committee for special exhibitions.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

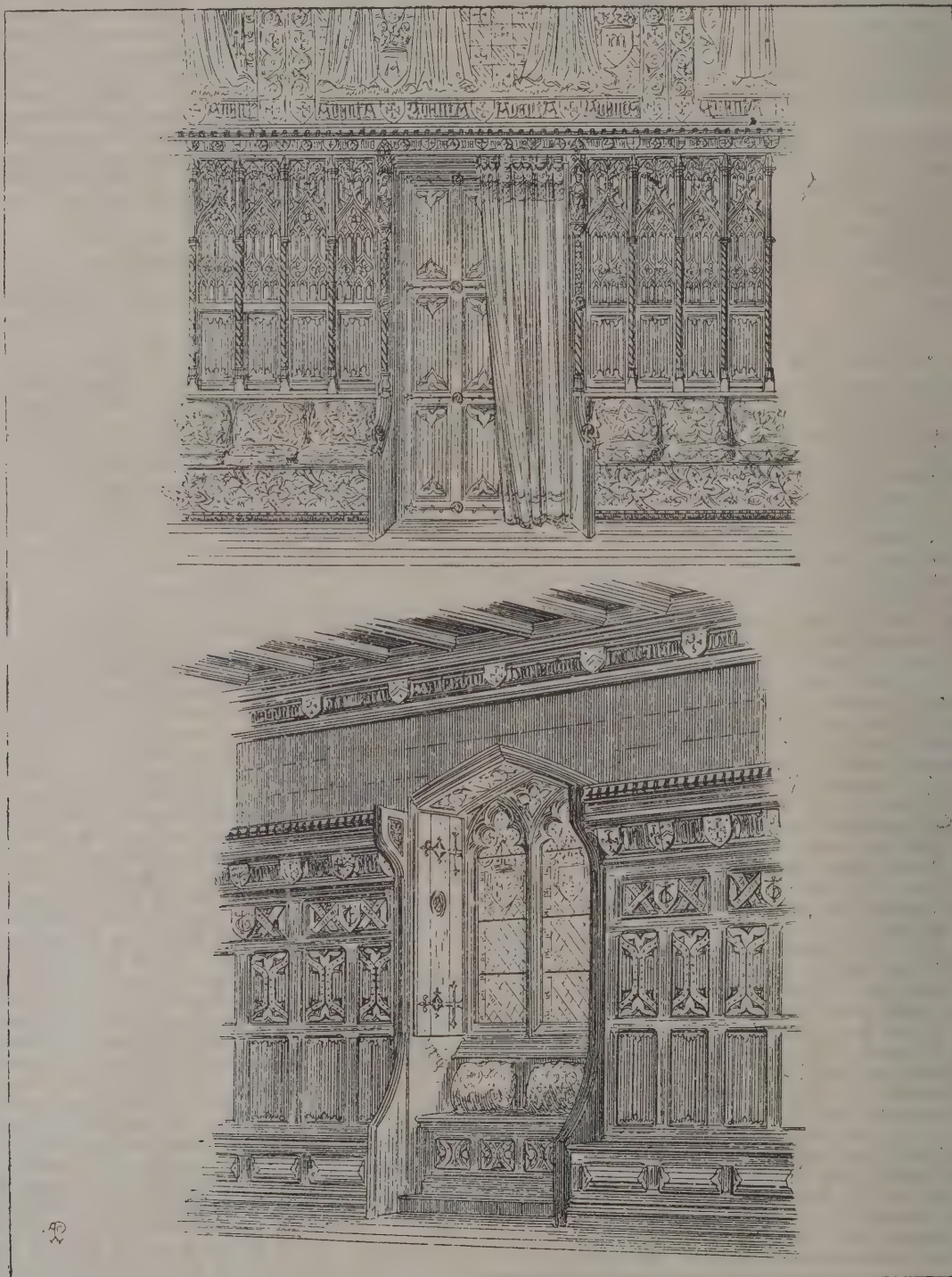
By A. WELBY PUGIN.

(Continued from page 76.)

IT is a common practice, when a chimney shaft is carried up in the centre of a gable end, for the barge-boards to be fixed before it. This is absurd; flues must necessarily stop the passage of timbers; consequently the barge-boards, which are only coverings of those timbers, should stop also (see next page).

If we examine the ancient woodwork which decorated rooms, we shall find that it consisted of mere panelling more or less enriched by carving, with large spaces left for hangings and tapestry.

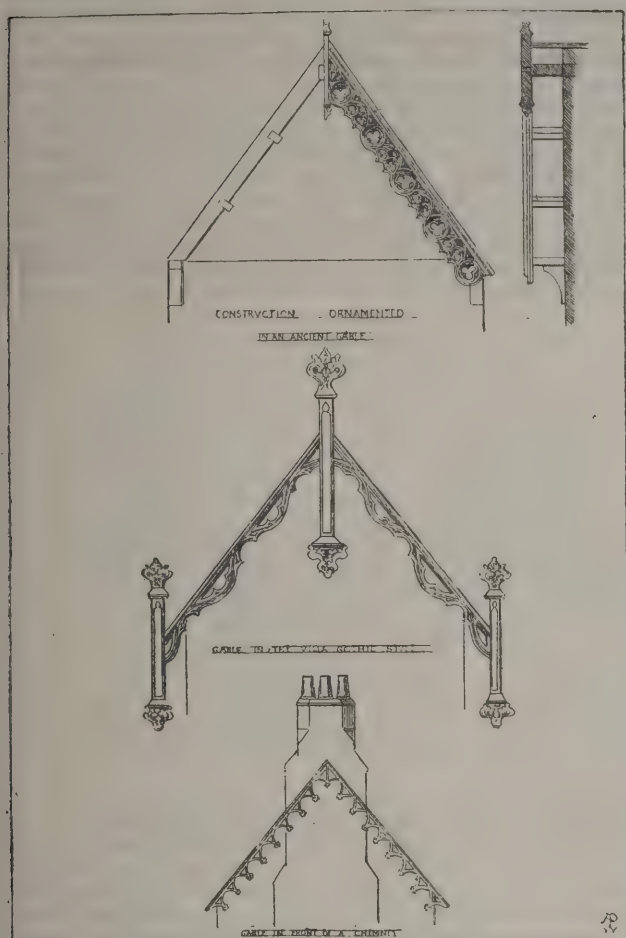
but that to which they properly belong. The modern admirers of the Pointed style have done much injury to its revival by the erroneous and costly system they have pursued; the interiors of their houses are one mass of elaborate work. There is no repose, no solidity, no space left for hangings or simple panels; the whole is covered with trifling details, enormously expensive, and at the same time subversive of good effect. These observations apply equally to furniture; upholsterers seem to think that nothing can be Gothic unless it is



Panelling of Rooms.

Were the real principles of Gothic architecture restored, the present objection of its extreme costliness would cease to exist. In Pointed decoration too much is generally attempted; every room in what is called a Gothic house must be fitted with niches, pinnacles, groining, tracery and tabernacle work, after the manner of a chantry or chapel. Such fittings must be enormously expensive and at the same time they are contrary to the true spirit of the style, which does not admit of the introduction of these features in any situation

found in some church. Hence your modern man designs a sofa or occasional table from details culled out of Britton's "Cathedrals," and all the ordinary articles of furniture, which require to be simple and convenient, are made not only very expensive but very uneasy. We find diminutive flying buttresses about an arm-chair; every thing is crocketed with angular projections, innumerable mitres, sharp ornaments and turreted extremities (see next page). A man who remains any length of time in a modern Gothic room and escapes without being



Treatment of Gables.

wounded by some of its minutiae may consider himself extremely fortunate. There are often as many pillars and gablets about a pier-glass frame as are to be found in an ordinary church, and not unfrequently the whole canopy of a tomb has been transferred for the purpose, as at Strawberry Hill. I have perpetrated many of these enormities in the furniture I designed some years ago for Windsor Castle. At that time I had not the least idea of the principles I am now explaining; all my knowledge of Pointed architecture was confined to a tolerably good notion of details in the abstract; but these I employed with so little judgment or propriety that, although the parts were correct and exceedingly well executed, collectively they appeared a complete burlesque of Pointed design.

I now come, in the last place, to consider decoration with reference to propriety; what I mean by propriety is this, that the external and internal appearance of an edifice should be illustrative of, and in accordance with, the purpose for which it is destined. There is a vast difference between a building raised to God and one for temporal purposes; again, in the first of these a great distinction necessarily exists between a cathedral and a parochial church, between a collegiate chapel and a private oratory, and in the second, between a royal residence and a manorial mansion—between monuments raised for public or national purposes and erections for private convenience.

The scale of propriety in architecture must always be regulated by purpose, and to illustrate this more fully I will divide edifices under three heads, ecclesiastical, collegiate and civil. The greatest privilege possessed by man is to be allowed, while on earth, to contribute to the glory of God; a man who builds a church draws down a blessing on himself both for this life and that of the world to come, and likewise imparts under God the means of every blessing to his fellow creatures. Hence we cannot feel surprised at the vast number of religious buildings erected by our Catholic forefathers in the days of faith, or at their endeavours to render those structures, by their arrangement and decoration, as suitable as their means could accomplish for their holy and important destination. It must have been an edifying sight to have overlooked some ancient city raised when religion formed a leading impulse in the mind of man, and when the honour and worship of the author of all good was considered of greater importance than the achievement of the most lucrative commercial speculation. There stood the mother church, the great cathedral, vast in height, rising above all the towers of the parochial churches which

surrounded her; next in scale and grandeur might have been discerned the abbatial and collegiate churches with their vast and solemn buildings; each street had its temple raised for the true worship of God, variously beautiful in design, but each a fine example of Christian art. Even the bridges and approaches were not destitute of religious buildings, and many a beautiful chapel and oratory was corbelled out in massive piers over the stream that flowed beneath.

The great object I have in directing your attention to such a Catholic city is to illustrate the principle of decorative propriety in ecclesiastical buildings. We have here various edifices of various dimensions, various degrees of richness, various in arrangement, yet each bears on its very face the stamp of Catholic. Cathedral or abbey, church or oratory, they all show that they are dedicated to the one true faith, raised by men actuated by one great motive, the truly Catholic principle of dedicating the best they possessed to God. It would be both unjust and unreasonable to expect a few parishioners to erect as sumptuous an edifice to the Almighty as the clergy of a vast cathedral, and even if they could practically achieve such a result, it would be out of character for the use and intentions of a parish church; neither ought we to look to a private chapel or oratory erected by the unassisted piety of an individual for the extent or ornaments of a public church, unless indeed that individual was possessed of great wealth, and then, although not in dimensions, it should surpass in glory the usual decoration of such buildings. In a word, architectural propriety as regards ecclesiastical buildings requires



Early Victorian Gothic.

that they should be as good, as spacious, as rich and beautiful as the means and numbers of those who are erecting them will permit. The history of our present vast and magnificent churches fully exemplifies this principle; many of them in their origin were little better than thatched barns; it was the best that could be done at that early period; but when the wealth and influence of the Church increased they were soon demolished to make way for more fitting structures; these in their turn were rebuilt with still greater magnificence. The ancient clergy were never satisfied, never content, never imagined that they had done enough; the scaffoldings were round the walls and the cranes on the towers of many of the English abbeys at the time of their suppression.

falsehood, which cannot escape the all-searching eye of God, to whom churches should be built, and not to man. Even under the Mosaic dispensation, the Holy of Holies, entered only by the high priest, was overlaid with gold; and how much more ought the interiors of our tabernacles to be lined with precious material, which are ten times more holy and deserving of it than the figurative tabernacle of the old law!—and yet in these times all that does not catch the eye is neglected. A rich-looking antependium often conceals rough materials, a depository for candle-ends, and an accumulation of dirt, which are allowed to remain simply because they are out of sight. All plaster, cast-iron and composition ornaments, painted like stone or oak, are mere impositions, and, although very suitable



Front and Side of a Deceptive Church.

It is not incumbent on all men to raise vast and splendid churches; but it is incumbent on all men to render the buildings they raise for religious purposes more vast and beautiful than those in which they dwell. This is all I contend for; but this is a feeling nearly if not altogether extinct. Churches are now built without the least regard to tradition, to mystical reasons, or even common propriety. A room full of seats at the least possible cost is the present idea of a church; and if any ornament is indulged in, it is a mere screen to catch the eye of the passer-by, which is a most contemptible deception to hide the meanness of the real building. How often do we see a front gable carried up to a respectable pitch, and we might naturally infer that this is the termination, both as regards

to a tea-garden, are utterly unworthy of a sacred edifice. *Omne secundum ordinem et honeste fiat.* Let every man build to God according to his means, but not practise showy deceptions; better is it to do a little substantially and consistently with truth, than to produce a great but fictitious effect. Hence the rubble wall and oaken rafter of antiquity yet impress the mind with feelings of reverent awe, which never could be produced by the cement and plaster imitations of elaborate tracery and florid designs which in these times are stuck about mimic churches in disgusting profusion.

It is likewise essential to ecclesiastical propriety that the ornaments introduced about churches should be appropriate and significant, and not consist of pagan emblems and attri-



Christian Churches in Pagan Style.

height and form, of the actual roof; but on turning the corner we soon perceive that it is a mere wall cramped to hold it in its position, and that it conceals a very meeting-house, with a flat roof and low thin walls, perforated by mean apertures, and without a single feature or detail to carry out the appearance it assumes towards the street (see woodcut above). Now the severity of Christian architecture is opposed to all deception. We should never make a building erected to God appear better than it really is by artificial means. These are showy worldly expedients, adapted only for those who live by splendid deception, such as theatricals, mountebanks, quacks, and the like. Nothing can be more execrable than making a church appear rich and beautiful in the eyes of men, but full of trick and

butes for buildings professedly erected for Christian worship. If the admirers of Classic decoration were consistent, on the very principles which induced the ancients to set up their divinities, they should now employ other and more appropriate ornaments, as all those found in the temples and other buildings of the pagans were in strict accordance with their mythology and customs. They never introduced any emblem without a mystical signification being attached to it. It would be unjust to charge the advocates of revived pagan decoration with an actual belief in the mythology of which they are such jealous admirers, hence they are guilty of the greater inconsistency, as the original heathens proceeded from conviction. They would not have placed urns on the tombs had they not practised

burning instead of burying their dead, of which former custom the urn was a fitting emblem, as being the depository for the ashes. Neither would they have decorated the friezes with the heads of sheep and oxen had they not sacrificed those animals to their supposed gods, or placed inverted torches on the mausoleums, had they believed in the glories of the Resurrection. But what have we as Christians to do with all those things illustrative only of former error? Is our wisdom set forth by the owl of Minerva, or our strength by the club of Hercules?



Modern Tomb in the revived Pagan Style.

What have we (who have been redeemed by the sacrifice of our Lord himself) to do with the carcasses of bulls and goats? And how can we (who surround the biers of our departed brethren with blazing tapers denoting our hope and faith in the glorious light of the Resurrection) carve the inverted torch of pagan despair on the very tomb to which we conduct their remains with such sparkling light? Let us away with such gross inconsistencies and restore the Christian ideas of our Catholic ancestors, for they alone are proper for our imitation. But

not only are the details of modern churches borrowed from pagan instead of Christian antiquity, but the very plan and arrangement of the buildings themselves are now fashioned after a heathen temple, for which unsightly and inappropriate form modern churchmen and architects have abandoned those which are not only illustrative of the great mysteries of the Christian faith, but whose use has been sanctioned by the custom of more than twelve centuries.

(To be continued.)

THE PROGRESS OF ARCHÆOLOGY.

(Concluded from page 79.)

LET us now apply these lessons a little more concretely to the complicated story of human progress. If we take our archaeological telescope and look back through the avenues of time, we shall reach a period when the great civilisations of the world were still incubating, and when in Europe, in North Africa, and in Asia, the many and scattered tribes were living very much as we can see tribes now living in savage countries, some by hunting, some by fishing, and some, no doubt, leading a pastoral life. This stage in Europe and its borders is marked archæologically by what we call palæolithic or antediluvian man. Some have compared him with the Esquimaux, because the Esquimaux, like him, has artistic instincts and can draw well, and because his surroundings are supposed to have been ruder. All this is very doubtful, and, in fact, misleading. So far as we know, the cave man of Europe was completely exterminated, as his companions the mammoth and the hairy rhinoceros were, and he has left no descendants. His remains are found in the caves, are cased with stalagmite, which effectually separates them from their successors. The immigrants who succeeded them are recognised by their long, narrow skulls, by their employing domesticated animals and cultivated plants, and by their burying their dead in long barrows. Whence they came we cannot positively say, but we may reasonably conjecture it was from some country where the animals and plants just named were indigenous in the wild state. In these graves in Britain no metal objects have been found, no tongued or barbed arrowheads, while the pottery is of the rudest character, marked by cylindrical shapes.

In one respect these long mounds present us with a puzzle. We can hardly doubt that among barbarous races few things are more likely to have been closely studied and more important, and yet we find the practices of burial and of cremation both in vogue. It has been thought that the two practices were, in fact, contemporary from the commencement. In this I cannot agree. In the South of England burial was almost universal among the long barrow men. In Scotland, on the contrary, cremation; but Mr. Anderson has shown that even there burial seems to have preceded burning, and it seems to me that burning the dead body was distinctly an innovation introduced by the men who succeeded those with the long heads, and that originally it was unknown among these men. Again, there is another curious distinction, which is apparently a superficial one. When stone was not to be had the bodies were laid on the ground in a more or less crouching attitude, and covered in. Otherwise, chambers were built of boulders or other rough stones, which were approached by long galleries open to the outside, apparently simulating underground dwellings, in which whole families or clans were buried. These, again, were sup-

planted, when the new men with round heads came in, by stone boxes or cists closed all round, the introduction of which was, in general, coincident with that of burning, although there was undoubtedly some overlapping.

Who, then, were these long-headed men? The early long-headed race of Britain has, according to fair evidence, left its trace in Europe in the long-headed, dark-skinned, black-haired Basques, and in Britain itself they seem to have survived in the Silurians of Glamorganshire (described by the Roman writers) and in the small black-haired people of South Wales and of parts of Ireland. Traces of the Basque language have been said to be found in the Celtic languages, but this particular branch of the field has been hitherto very little explored, nor have the local place names in those districts where the race may be supposed to have survived. Then we seem to have a clue which points to the men with the long heads having come from the south-west. The Basques have their nearest relations in North Africa, where a race which buried, and did not burn, its dead once occupied the country, whose remains are still to be found among the Berbers and Kabyles of the Atlas range and among the Guanches of the Canary Islands. And these races of the Atlas take us on again to the Valley of the Nile, where the early Egyptians are now recognised to have had close relations of blood, &c., with them, and who were, as you know, almost fanatically devoted to the practice of burial, as contrasted with burning, in disposing of their dead. In this behalf it is curious to remember the distribution of the so-called cromlechs, which are merely chambered tombs of another form. They are found all round the northern part of Africa, in Spain, in the maritime parts of Gaul, all over Britain, where they have not been displaced by the plough and harrow. They abound in Holland, and occur again in Scandinavia, specimens of their primitive stock having migrated from West to East in Europe along the sea-board. This line of migration leads us to the Nile Valley as a goal, and it seems to some of us that the earliest inhabitants of that valley were first cousins of our long barrow men. Then, under favourable conditions of a pure climate and access to the necessary tools and weapons of culture, there developed a race which, although unacquainted with metals, produced a wonderful culture—that of the Egyptians of the old Empire. We have as yet found no traces of a beginning of this culture on the spot, and until quite recently, when Professor Petrie has made some remarkable discoveries at Koptus, which may throw some light on this aspect, we seem to have in the monuments of the fourth and fifth dynasty every kind of excellence we associate with Egyptian art fully developed, including its hieroglyphical writing, its strange mythology, &c., and all the while Egypt was still in what the Scandinavian antiquaries describe as the stone age. Whether this art was imported with the race which developed it in the Nile Valley, or was entirely indigenous, we do not know. It may be that it was the discovery of the ancestors of the tribes who are now represented by the Bishir Kadanlowahs and other wild tribes of the Eastern Soudan, or by the Bishirs of the Atlas range, who border the Nile Valley on either hand, and must have done so for a very long period. One thing seems clear, that for a very considerable period the art of the Nile Valley was isolated, and does not seem to have affected that of its neighbours. To us this art is supremely interesting, because we can trace its progress step by step through manifold vicissitudes for 4,000 years. Let us now return again to our own country.

The long-headed people here were displaced very largely by a race with round heads, who burnt their dead and put their ashes in beautifully constructed urns, and then deposited them in stone cists or boxes in round or saucer-shaped and not in long barrows. As we have said, there was considerable overlapping between them and their predecessors, who adopted in some cases their customs, including that of burying in round mounds or barrows. The shape of the skulls of these new men shows us what a profound racial difference there must have been between them and their predecessors. They apparently came from another direction, and with different surroundings. So far as we know, they were the first wave of that migration of tribes from the East which have successively followed each other in Europe, and are represented by the earlier Celts in central and southern France and large parts of Spain, and among the Irish or Scottish Gael. Just as their art-remains proved the round-headed folk to have mingled with other predecessors, so do we find among these earlier Celts evidences of mixing with their predecessors, the Basques.

If we follow our maps eastward, and track the steps of those races who burnt their dead, we shall find them linked step by step, if not by race by a certain relationship, in their arts to the early dwellers in Mesopotamia. There a similar development of culture to that we all know so well in the Nile Valley, and likewise in the stone age, took place in the valleys of the Euphrates and the Tigris. Here, however, we seem to have evidence that the culture was not home grown, but there are reasons for believing that the men who founded the earliest known communications with Chaldea brought with

them the arts by which we know them from the Elamitic mountains to the East, whence they seem to have sent colonies westward into Mesopotamia and eastward into China. This curious and interesting induction is one of the most important discoveries of recent years. It enables us to link the culture of the furthest East to that of the West, and it also enables us to conclude that the arts are not the peculiar heritage of any one race, for here we seem to be compelled to admit that the formation and venue of that culture that we call Aryan or Indo-European is really among the now despised Turkish and Finnish races. It was a race very nearly akin to Laps and Finns which certainly invented the cruciform writing, and apparently developed the earliest religious system in Chaldea.

From this race it was directly learnt by the Semitic races, whose original home was Arabia, and whose enterprise and vigour distributed them far and wide. One thing we must remember, that so far as our present evidence goes, the arts of Babylonia were as different from those of the Nile Valley as the language, the mythology and the appearance of the people were. These Semitic peoples founded the successive kingdoms of Babylonia and Assyria, but it was the Phœnicians who were chiefly instrumental in multiplying and distributing the wares which the older men of Mesopotamia had made. They were to be found trading and trafficking everywhere, from far-off Britain to far-off Thule, and still further to that land of mist and snow where the dragons were supposed to guard the gold deposits of Siberia. Their settlements and trading ports were to be found all over the Mediterranean. These same Phœnicians were also great metallurgists, and if not the discoverers of bronze, which added so much to the renown of the early craftsmen, they were so far as we know the great distributors of the knowledge of making and also of the materials of it.

Let us revert once more to northern Europe, and notably to our own country. It was during its occupation by round-headed people that the use of bronze was first introduced here. Gold was apparently their own discovery, but bronze, I believe, was an imported art, and had nothing to do with the introduction of a new race. The bronze workers, as we know from the numerous hoards discovered, and also from the numerous moulds which have been found, were travelling tinkers and metallurgists, such as the metal-workers of Finland still are, and as the Mediæval goldsmiths in Scotland were. The weapons, ornaments and tools are of the same type, differing in slight details only, from one end of Europe to the other, and showing that the art was spread over a wide area occupied by many races, and it seems to have spread from the Mediterranean lands perhaps by the agency of those traders who took Baltic amber to Greece and Italy, and who in the first instance were probably the Phœnicians. It is curious that this bronze culture should have advanced to very different stages of style and elaboration in different areas. In Spain it advanced only to a small degree, as we may learn from the explorations of my friends the Brothers Siret. In England and France considerably further. In Scandinavia and Hungary further still, and I would suggest as an explanation that the reason is that in Spain and the western countries bronze was displaced by iron at an earlier date. Thus, while in Scandinavia we have no reason to suppose that iron was used until about the Christian era, in Britain it must have been used several centuries earlier. Thus the later and more developed bronze culture of Denmark and Hungary corresponded in age, and was synchronous with the earlier use of iron in Britain and probably also in Gaul and Spain, and hence it represents a later and more developed art. As I have said, the introduction of bronze was the introduction of a new art and not a new race, and it is a great mistake for people to wash off the bronze folk as if they were nothing different to the iron, wood and stone races.

The next art revolution in their latitudes did, however, mean the importation of a new stock. This was coincident with the introduction of iron. This problem, as it presents itself in Britain, is one of the great puzzles of early archaeology, for it means a great deal more than the mere introduction of iron for cutting weapons and tools; it means the introduction of an entirely new style of ornament, consisting of the most graceful scrolls known as trumpet scrolls of endless variety and taste. Alongside of this we have the most wonderful skill in metallurgy. Nothing can exceed the delicate manipulation with which the old artificers fashioned the objects of manifold shape and of entirely new designs, bone tracings, shields, helmets, sword and dagger sheaths, spoons, mirrors, &c., and the dexterous way in which they ornamented them with enamel, which they were, apparently, the first to discover and to apply. These objects have occurred in the greatest numbers in Great Britain and in Ireland, but they have also been found in Belgium, in Eastern France and in certain parts of Switzerland, such as La Teûle, &c., and it would seem, therefore, that they reached us by some migration down the Rhine. One important fact about this art is,

that we know its relative date. We know that it was living when the Romans conquered Britain. The remains of the early Roman conquerors are found buried with objects of this date in the hill parts of Dorsetshire, &c., and the descriptions of Cæsar apply to this charioteeing people. Not only so, but it survived in that part of these islands untouched by the Roman Conquest, namely, in Ireland. The art of Ireland until it was displaced and sophisticated by the Norsemen was a mere development and growth of this art, and it is found abundantly exemplified in the so-called letter ornaments illustrated by Westwood in his work on Irish MSS. How long it had flourished here before the Roman Conquest and at what date it displaced the art of the bronze people we do not know. As I have said, this same art is found in the Rhine Valley and in Switzerland; it is not found in Denmark and Germany, where the objects of the iron age have an entirely different origin and different history. Nor, again, is it found in Western France or in Spain, and the only avenue, therefore, by which it can have reached Britain is that found out by my friend Mr. Arthur Evans, namely, the valley of the Rhine. In his very original and suggestive memoir on the subject he traces this art to Switzerland. There it seems to have incubated and developed itself in contact with the art of the Etruscans, with which at some points it has an analogy, but as a whole its inspiration is not Etruscan, but it goes back further to that primitive Mediterranean art which, for lack of a better name, we call Mykenean—the art of the Homeric poems. It is in the Mykenean objects that we find the same scrolls and the same dexterous manipulation of metal and the use also of enamel. The distinction, of course, is that the use of iron had been meanwhile introduced. This, however, was only for cutting objects; the ornaments, the sword sheaths, the shields, helmets, mirrors, &c., all continued to be made of bronze. The introduction of iron merely displaced the kind of metal and did not affect the art, nor did it do so in Denmark or in the far West. The art in both these places no doubt grew, but it grew out of the old art of the bronze age, supplemented by new models and new objects imitated from those which traders brought from Rome and elsewhere. To revert for a sentence or two to the people who developed and used this later Celtic art, who also used coins. These coins have been traced partially to the early coinage of Marseilles and partially to the coinage of Philip of Macedon, large quantities of whose gold statues were probably taken back by the Gauls after their invasion of Greece. The gradual sophistication of these fresh models has been traced and followed out by my friend, Sir John Evans, with his usual ingenuity and acumen.

On another side we seem to have evidence that Druidism, which differed from the old polytheistic religion of the Gauls and Germans, which was related to the religions of Rome and Greece, was imported from the far East, and, having apparently reached Thrace, was carried back with them by the Gauls who invaded Greece, and who thus acquired the notions of metempsychosis, &c., and I am not at all sure that the old notion of Godfrey Higgins, which has not had many adherents lately, is not true—that Druidism was largely the outcome of the teaching of the Buddhist monks, who, we know, penetrated into Persia and Syria, as they spread the ideas and the artistic instincts of India further east from Japan to Java. But to return to Europe.

The art I have been describing, which has been styled neo-Celtic by Sir A. Wollaston Franks, who has done so much to illustrate it, was imported by a new wave of population, to which the name Belgic has been given, and whose original home was apparently in Switzerland and South Germany. This race is now best represented by the Welsh and Britons, but we must not forget that it also had large colonies in Ireland, where neo-Celtic art became predominant, and where it outlived the Roman domination elsewhere. In Great Britain, as on the Continent, this art was displaced, as the art of so much of the world was, by the Romans—itself a daughter of Greece. It is not my purpose to discuss such a well-known subject as Roman art. I would only point out to you how the newer school of archaeology has shown that Roman art was very largely the art of the Roman provinces, and not so much Italian. Alexandria was a great centre of silversmiths and other artistic metalwork; Treves and Cologne and Lyons and Clermont of pottery, of glass and also of metalwork; and there can be no doubt that Greece, both continental and insular, continued to be under the Roman domination a fertile mother of sculpture, architecture, &c. Rome was the great assimilator and distributor of these various provincial wares, as her language became the *lingua franca* of half the known world; her laws embodied and displaced other forms of jurisprudence, her generous Pantheon welcomed the foreign gods, and her military system mixed and mingled the natives of very different countries and climates. I would only say, by the way, how necessary it is that we should have a complete survey of Roman Britain such as has been begun so well at Silchester, and how some of us long to see the spade put into your own Uriconium.

When the Roman capital was removed to Byzantium new

and fresh ideas were apparently developed, or perhaps old ones which had been localised there were distributed in all directions. In one direction Parthians and Sassanians drank at the well, and it is not possible now to say whether the embroideries, the damasks, the silver bowls, &c., which we associate with these eastern peoples were Byzantine or not. In another direction the art of Byzantium spread all over the Teutonic world. The art we call Teutonic is really Byzantine. The tribes which were planted on the various frontiers of the Empire and were largely in its service and its pay were all directly indebted to Byzantium for their art. Hence we find the same art with slight local differences among the Goths of the Crimea, the Lombards in Italy, the Burgundians in Austria and Switzerland, the Alemanni on the Rhine, the Merovingians in Gaul, the Angles and Saxons in Britain, the Visigoths in Spain, the Vandals in Africa and the early Scandinavians in Denmark and Scandinavia. The cloisonné jewellery, the interlaced dragon patterns, &c., all of which have such a common likeness, have an equal resemblance to the work which we can trace to the Queen of the Bosphorus, and as Lindenschmidt was never tired of preaching, there is no Teutonic art. The art of all the Teutonic tribes who founded the modern States of Europe was in reality the art of Byzantium, and this was so in later times also. The art of the Carolingian empire and of the later Anglo-Saxons was the art of the exarchate of Ravenna, just as the art of south-eastern Europe, as preserved in the churches of Kiev, was the direct daughter of Constantinople. The enamels, the bronze works, the ivories, the illuminations on the books, the jewellery, &c., are all directly traceable to the same opulent mother.

But it was among the Arabs that the seeds of Byzantine art flourished and thrived the most. The Arabs themselves in regard to art were always a sterile race. Like their own sands they do not seem to have had the instinct for art, but they had the instinct of government, and at Bagdad, at Cairo and at Granada they founded communities which are as famous as any in the world's history. They had the Semitic instinct, too, for making money, and, having made it, for spending it freely as munificent patrons, but they initiated nothing. When we speak of Arab art we mean the art of Byzantium, which had a curious Renaissance of its own under the impulse of fresh ideas gathered together from every wind of heaven by the enterprise of these Arab traders, who crossed all the known seas from China to the Straits of Gibraltar. Cæsarea, Antioch, Damascus and Alexandria, the mother of Cairo, were Byzantine cities with flourishing arts before the Arabs annexed them, and, so far as we know, the arts of Damascus and of Cairo were the daughters of Byzantine art. The mosques of St. Sophia and of Omar were Christian churches before they became the models for the stately buildings of the later caliphs. Embroidery, pottery and glass and metal-working, including damascenery and bronze casting, all passed from Byzantine craftsmen to those of Arabia, and the chief development they received was in response to the injunctions of the Prophet against the making of graven images and of painted representations, which compelled those employed by the Arabs to devote their energies to developing conventional ornamentation and so-called arabesque work. Their contact with the Chinese and the Hindoos enabled them in pottery, and probably also in bronze work, &c., to supplement the lessons they learnt nearer home with fresh lessons from the farthest East. And then came a curious phase, as is often the case in the modest life of our homes; the daughter, having outgrown her mother's teaching, returned some of the lessons and became in turn the fruitful mother of new ideas and of a new inspiration. From Egypt and from Syria art workmen found their way to Venice and Pisa and other Italian towns, and started men along new roads by presenting them with new models. The glass, the brass-work and the pottery of Venice, when Venice headed the Renaissance of the industrial arts, were all the children of Eastern workmen imported by the rich Republic. Another wave of Mohammedan art influence passed through North Africa into Southern Spain and its islands. There the lusted wares known as the majolica had, if not their origin, their great development, and thence they were transplanted to Italy. The fine tiles which the Moors made were widely imitated, as their azulejo by the Spaniards, and thence also largely came the astrolabus, the clocks, and other inventions which Arab science had produced.

One feature in the panorama we have hastily traced is obvious, namely, that it has been the nations and peoples with great mercantile enterprise who have not only been rich enough to patronise, but who have also been in contact with fresh ideas, which have given art its new departure. The Flemings at Bruges and the Hanse traders all over the Baltic accumulated and developed ideas which they picked up at Novgorod and in the far-off districts of Perim, &c. On the other hand the Venetians and the Genoese had their factories all over the Black Sea and among the isles of Greece. They shook hands then with the caravan traders from China and from the far countries of Siberia, and had to supply each other in return

with objects suitable to their tastes and needs. The Mongols were masters of the greater part of the Asiatic world. Their ruthless conquests drove the artificers of Persia into India and into Egypt, and in either country a great rejuvenescence of the arts took place at the same time in the same style, and it is a most curious piece of history as well as interesting in art to compare the tombs of the caliphs at Cairo with those of the Pathan sultans at Delhi. Then the Mongols themselves became civilised and settled, and their artificers crowded back and brought new ideas with them, and at Tiflis and Samarcand erected buildings and decorated them in a manner previously unattained. Not only so, but great masses of workmen were transported eastward and westward under the control of the same exacting masters, and thus the designs on Chinese porcelain—the phoenixes and dragons, &c.—invaded Persia, and similarly the Chinese learnt how to make what we call blue-and-white porcelain, which they did not know until the time of the Ming dynasty.

To take one more illustration. We cannot wander about the glorious ruins of your county—such ruins as Wenlock Priory—without being reminded of the lessons in every stone. It is not only that we realise how much we owe to Gregory and to Augustine, who planted Christianity here, to Benedict and St. Bernard, and their indomitable disciples and scholars, who reared aloft high standards of purity and simplicity of work, and of duty in a community which was disintegrated under the influence of a barbarous soldiery and of brutal and uneducated manners. We are further reminded, as we can almost hear the jingling spurs and iron encased feet of the knights trampling down the aisles, that it was the romantic enterprise of the crusading nobles, prelates and monks which brought back the genius of Gothic architecture to Europe and the taste for poetry, for sentiment and for art which they had learnt from the Saracens, followers of Saladin, and it was very largely their handiwork that flooded Western Europe with new ideas, which blossomed in the magnificent images of our minsters, and the equally fresh and novel ideas which Froissart and Chaucer and Malory enshrined in immortal verse and prose.

I do not propose to carry this disintegrated story further. My purpose and object have been to press home as a universal factor of human progress the element of continuity which we all concede in regard to particular cases, and also to press home the lesson that we cannot do justice to our subject if we limit our horizon, as we are apt to do, to our parish, our county or our island. These are only outlying pieces of much larger areas, and the true way of studying and of profiting by the study of art is not only to be catholic, but to be continually conscious of its interdependence and continuity.

Lastly, one lesson let us carry away with us. We forget the humility which becomes the students of the venerable past. If it is true that we are the heirs of all the ages, it is true also that the memory of much of our inheritance is blighted and sophisticated. It is not exhilarating to our vanity and self-respect to think that human progress is not a continual growth, that men reach levels very often which those who come after cannot emulate. The men who built the Parthenon, no less than the unknown architects of so many of our great minsters, the artificers who manufactured the lovely embroideries, the matchless tiles, the radiant decorations of the Alhambra and the Taj at Agra have left no heirs, and we are mere scholars sitting at their feet. Our strength is not great enough to carry the lamps which they carried in so many ways. Every generation of men, it may be, has its triumphs, yet it is not altogether reassuring to think that in the great meeting in the happy hunting-grounds, beyond the screen of night, it will not be the nineteenth century which will occupy the foreground. Homer will still lead the procession of the poets, Socrates of the moral philosophers, Phidias of the sculptors, Raphael of the painters, and not only so, but we shall have to give place to many unknown and unchronicled masters of their craft in the days of old. When that day comes I know not what I shall say to the archæological giants, whose disciple alone I can claim to be, for my presumption in addressing you in this incoherent fashion, save to remind them that if the men of Shropshire have not all the gifts of their forefathers, we still command the virtues of patience and long-suffering, of urbanity and kindness; and I may be allowed to conclude with the hope that the sun may continue to shine brightly on your homes. *Floreat Salopia!*

A Copy of the supplement to the *Egyptian Journal Officiel* containing a statement of the conditions under which architects are invited to compete for the prizes—amounting in all to £1,000—offered for the best and four next best designs for the new Museum of Antiquities at Cairo, can be seen at the Commercial Department of the Foreign Office, London, between the hours of 11 A.M. and 6 P.M. It is hoped that additional copies of the programme will shortly be at the disposal of persons who may decide to compete.

MONUMENTAL BRASSES OF SHROPSHIRE.

A PAPER on the Shropshire brasses was read by Mr. Mill Stephenson, F.S.A., at the meeting of the Archaeological Institute. He said:—Shropshire does not afford a large field for the study of this class of memorial—more incised stones are to be found in the churches—consequently, as in all stone countries, fewer brasses are to be looked for. As far as I have been able to ascertain but eighteen brasses with effigies remain in the county, though two others are reported to exist at Clun and Upton Cressett. These I have as yet been unable to investigate. Others may also be brought to light in the remoter districts, and I would suggest that the Shropshire Archaeological Society should find some member with leisure to visit all the churches in the county and make a complete list, including at the same time a list of the incised slabs and of the effigies on high tombs, such lists to be eventually published in the Transactions, and added to from time to time as new discoveries take place. These lists would be of great service to all workers in this line, and by their aid a check would be placed on an attempt to alienate them from their respective churches. It so often happens that after restoration some brass, or part of a brass, is missing. This more especially occurs in the case of fragments or little-known brasses. The larger and well-known examples can take care of themselves, for they are well known and constantly inquired for, but the less known, though equally valuable, examples are constantly in danger; either they are lost through sheer ignorance of their value or else they are divorced from their original stones and placed on the walls of the church as ornaments. Take the case of the brasses at Withington, in this county. When the church was rebuilt they were taken out of their original slabs, and were for some time in the custody of a neighbouring incumbent. Eventually they were returned to the church. There was nothing left to show how they should be arranged, so they were nailed to the tower wall, with the result that one shield belonging to the Only family now appears under the effigy of Adam Grafton, a former parson of the church. A more serious injury was done to the brasses by the use of iron nails, which, as might be expected, produced corrosion. Brass screws or rivets should alone be used in cases where it is absolutely necessary to remove a brass. To return to the subject before me, the brasses of the county may be roughly divided as follows:—Armed figures sometimes accompanied by ladies, 6; civilian ditto, 5; ladies alone, 2; ecclesiastics, 4; curious (shrouded figures), 1—total, 18. Inscriptions alone are not included in this list. A few are exhibited to-night, but the list is not complete. Brasses at Harley, Ightfield, Middle, Tong (Ralph Elcock, 1510), and Withington exhibit marked peculiarities, and are probably the work of some local artist, possibly of a school of metal-workers established at Coventry in the latter half of the fifteenth century. A good deal of their work is to be found in the adjacent counties of Warwick, Stafford and Northampton. The fine brass at Acton Burnell may also belong to a local school, but in this case a northern origin must be looked for, and in all probability it may be attributed to the earlier provincial school established either in Yorkshire or Lincolnshire, more probably the former, in the end of the fourteenth century. Much of their work remains in these two counties. Of these local schools of engravers very little is known except in the case of the Norwich school, where some trace of a family named Brasier, bell-founders and brasiers, has come down to us. The finest military effigies in this county are the ones at Acton Burnell, 1382, to Sir Nicholas Burnell, lord of the manor of Holgot, and that at Tong to Sir William Vernon, constable of England, 1497. The later examples at Harley, c. 1475, Middle, c. 1490, and Withington, 1512, all belong to the local school, and exhibit marked peculiarities. At Adderley is a very late example, of date 1560. There are no early examples of civilians to be found in the county; all five examples belong to the last half of the sixteenth century, and present no points of interest. Of ecclesiastics there are but four examples, but one of an unknown abbot, c. 1390, at Adderley, is of great interest. So far I have been unable to identify him. He has unfortunately lost his head, and the rubbing exhibited does not show the indent as it should do. The abbot wears the amice, alb, dalmatic, maniple and chasuble, but has neither the tunic, stole, sandals nor gloves. In his right hand is a crozier, and in his left a book. The next example is a small figure at Tong to Ralph Elcock, 1510, a brother of the college. He wears a cassock, surplice and amice. The figure is of local origin, and the inscription is somewhat blurred. In the same church is a fine figure to Sir Arthur Vernon, warden of the college and rector of Whitchurch, 1517, showing him in the dress of a master of arts of the University of Cambridge. Above the figure is a very pretty little chalice with a rayed wafer inscribed "I.H.S." The last of the series is a figure in cassock, surplice, almuze and cope to the memory of Adam Grafton, "the most worshipful priest living in his days," but at the same time a great pluralist, for the inscription states he was not only chaplain to King Edward V. and to Prince

Arthur, but also Archdeacon of Stafford, Warden of the Battlefield, Dean of St. Mary's College, Shrewsbury, and Parson of Withington, where apparently he was buried. This is also a local figure.

EDINBURGH SCHOOL OF APPLIED ART.

THE following awards have been given in the Edinburgh School, of which Dr. Rowand Anderson is the director:—Class of General Design.—Architectural designers; second year students (first section):—1 and 2, John Stewart and Alfred Greig (equal), 5*l.*; 3, John S. Syme. Second section:—1, James H. M'Lachlan, 3*l.*; 2, James H. Rutherford; 3, Hal Wright; 4, Wellesley Bailey; 5, A. Balfour Paul; 6, Alexander Law. First year students (first section):—1, Andrew Muirhead, 3*l.* Second section:—1 and 2, James Smith and George Henderson (equal), 1*l.* 10*s.*; 3, Arthur J. Driver; commended, Edward J. M'Ardle. Decorators.—Second year students:—1, John M'Isaac, 3*l.* First year students:—1, James Ballantine, 2*l.* Furniture Designers.—Second year students:—1 and 2, John D. Trail and John Ednie (equal), 3*l.*; 3, Wm. Simpson. First year students:—1, Robert Reid, 1*l.* 10*s.* Masons, Plasterers, Wood-carvers, &c.—Second year students:—1 and 2, Alexander Kelman and Robert Aitken (equal), 3*l.*; 3, George Hunter, 3*l.* First year students:—Commended, John Horne. Silver-chasers and Engravers.—Second year students:—1, John Hutchison and Thomas Pringle (equal), 3*l.* First year students:—1, Alexander Reid, 1*l.* 10*s.* Colour Class.—Second year students, morning class:—1, Alfred Greig, 5*l.*; 2, Hal Wright and John S. Syme (equal), 2*l.* 10*s.*; commended, Cecil S. Burgess. First year students:—1, James H. Rutherford, 3*l.*; 2, James Ballantine. Evening class, second year students:—1, John D. Trail; highly commended, John Stewart; commended, John Ednie. Evening class, first year students:—1, Andrew Muirhead.



Darlington Proposed New School Competitive Designs.

SIR,—My attention has been called to a paragraph in your last issue referring to these designs, and stating that Mr. E. R. Robson, architect, London (to whom the designs had been submitted by the School Board), had placed them in the order given in your paper. Mr. Robson did not place any other plans in order of merit beyond the first and second.

I think, in fairness to the other competitors, this letter should appear in your next issue.—Yours truly,

F. T. STEAVENSON, Clerk to School Board.

Darlington School Board, Clerk's Office:

August 8, 1894.

GENERAL.

Mr. J. L. G. Mowat, the senior bursar and librarian of Pembroke College, Oxford, who committed suicide on Monday night, was an enthusiastic student of archaeology, and had just returned from a survey of the Roman wall. One of his last acts was to draw a cheque for his subscription towards the fund for exploring that work.

The Directors of the Halifax and Huddersfield Banking Company, Limited, offer two premiums of 100*l.* and 50*l.* for designs for a bank to be erected in Commercial Street, Halifax.

Mr. J. H. Appleton has been appointed head-master of the School of Art at Oldham. He was formerly assistant-master at Lincoln.

The Hull Town Council have considered various sites proposed for the new buildings which will be used for the public hall, technical school and free library. It was decided to select one in Albion Street which will cost 57,000*l.*

Mr. F. M. Simpson has been appointed professor of architecture in University College, Liverpool, and will consequently have direction of the Municipal School of Applied Arts.

The Dresden Gallery has secured Lord Dudley's *Death of St. Clara* by Murillo for the sum of 3,000*l.*, which is considered a large price in Germany.

Mr. William Gibb, of Edinburgh, has received Her Majesty's permission to select subjects and make water-colour drawings of objects in her private collection at Windsor Castle for an important work on naval and military relics.

The Late W. Calder Marshall, R.A., has, it is said, left property valued at 48,000*l.*, but this may include his unsold works, which are numerous.

The House of Commons Improvements which will be carried out during the recess will cost about 14,000*l.*

The Architect.

THE WEEK.

BUILDERS have often reason to believe that building acts and by-law committees are rather arbitrary, if not despotic, in their dealings. It is supposed that much is done of a disagreeable sort, especially when the owners and builders are not influential. The people of Carlisle will soon have an opportunity of judging whether the urban sanitary authority of that city does or does not resemble many other authorities, in permitting an infraction of the by-laws because the culprits are supposed to be a higher class than the majority of people who are concerned in buildings. A flagrant breach of by-laws has been committed: a wing has been added to the local infirmary, although the plans were not approved. It appears plans were sent in by Mr. FERGUSON, the architect. The committee directed that the cross walls should not be less than 4 inches thick. The plans were withdrawn, and others, with amendments, were not submitted. That would be acting according to precedent, and therefore unworthy of a man of spirit. Not only was the sanitary authority snubbed for its presumption, but it was reviled because it did not take the prompt action that was necessary. In a document issued by Mr. FERGUSON it was said "the board of health objected to the plans submitted on the advice of the city surveyor; that partitions between the bedrooms were cross walls and must therefore be of specified thickness; that 4-inch drain-pipes should not be allowed on account of an alleged agreement of the committee to that effect. No notice, however, was taken of these illegal objections, there being a strong infirmary committee." To suggest that a public body is cowardly and afraid of a strong committee is like a revival of the preliminaries to a scrimmage in the old days of border warfare. But whatever may have been the case in those days about Carlisle, it is no longer, we hope, considered there a sign of strength to be a law-breaker. Wrong has been done, and it is the bounden duty of the sanitary authority to assert the law. The wing has been raised by means of donations, and we suppose another appeal will have to be made to the benevolent if it should be demolished. Let the consequences be what they may, it is necessary to demonstrate, and without any compromise, that by-laws are to be general in their application. The fiery spirits of the northern city may rebel against the petty laws which tradesmen administer, for we suppose some of the citizens must, like SIMON TAPPERTIT, feel it is irksome to drag out an ignoble existence "unknown to mankind in general," and as they cannot be raiders, brigands, genteel highwaymen, or corsairs, they have to be satisfied with illegalities for which the innocent can be made to suffer.

AN ingenious point was raised by Mr. TOBIN, the solicitor for Messrs. MONK & NEWELL, the contractors, in an action against them for damage to roads which was lately heard in the Birkenhead County Magistrates' Court. The claim of the Wirral Highway Board was for 410*l.* 10*s.* 7*d.*, and arose out of the transit of materials for the Connah's Quay and Birkenhead Railway. For a long period a traction engine, weighing from ten to twelve tons, with trucks of rails, sleepers, &c., passed over the roads, some of which were only constructed for agricultural traffic. When a summons was issued the contractors offered 100*l.* in settlement of the claim. The surveyor to the Highway Board gave evidence that beyond ordinary expenses 310*l.* had been spent in Burton Road, Nessie Road and Denhall Lane, besides 109*l.* 7*s.* 5*d.* on Storeton Lane. The solicitor elicited in cross-examination that the surveyor had given a certificate for the expenses incurred on the four roads up to December 7 of last year, which showed that the extraordinary expenses amounted to 285*l.* 6*s.* 11*d.* On May 31 he gave four certificates, amounting altogether to 419*l.* 10*s.* 7*d.*, including the 285*l.* 6*s.* 11*d.* certified in December. The difference between these sums was 134*l.* 3*s.* 8*d.* It was contended that the Highway Board should have recovered the sum certified for on December 7 within six months after the certificate was issued. As they had not done so they could not now recover under the new certificate issued

on May 31. The magistrates adopted Mr. TOBIN's view, and 285*l.* was struck out. Messrs. MONK & NEWELL offered to pay the balance if no further proceedings were taken, but the offer was declined. After hearing evidence on both sides the magistrates ordered the payment of 129*l.* 15*s.* It generally happens that when roads are used by contractors excessive demands are made, and it is only equitable that some points should be allowed, by which charges are modified.

It is a long time since the Libyan desert was brought under public notice. BAYLE ST. JOHN's book was considered to have exhausted the subject, at least for a couple of generations; and many other regions were discovered which possessed the interest of novelty. Mr. HERBERT WELD-BLUNDELL was able to excite some curiosity about the desert by a paper which he read before the British Association on Monday. At Abbas he saw an extensive tract of ruins dating from the Roman occupation, the central point being a large square fortress fitted inside with a complete system of small vaulted cells and surrounded by groups of ruined buildings, all showing the same series of round arched vaults. They show no definite plan of arrangement, and may have been simply the various buildings in which prisoners were confined. Mention of penal settlements was met with among Egyptian monuments dating as early as the nineteenth dynasty, and they are alluded to by various Christian writers. Within the precincts of the prison grounds was a half-domed temple, with Christian inscriptions rudely scratched in Greek letters. Apparently through the silting up of the wells, which were very elaborately vaulted and tubed underground, or in consequence of earth movements, the water supply failed, and the place was entirely abandoned from Roman days till about twenty years ago, when a runaway camel was followed and traced to the spot. Another place, called Muth, is a village which deserves attention from French Impressionists, for it is built on a mound of bright golden ochre, the streets and people being covered with a bright yellow dust, a relief to the usual dull mud colour of an ordinary Egyptian village. Gasr is principally interesting from the vicinity of an Egyptian temple of the second century of our era. The walls inside and the chambers are thickly inscribed with hieroglyphs, but the work is late and inferior in artistic quality. At Siwah are the remains of the Temple of Jupiter Ammon, but there is not much remaining of the oldest of the oracles to indicate its plan and appearance. Mr. WELD-BLUNDELL's paper was one of the most interesting of those read this year in the geographical section.

A DESCRIPTION of the city of New York has been issued by the Otis Elevator Company, Limited. The illustrations of buildings are most numerous, and suggest the character of public, domestic and ecclesiastical architecture in the great city. The number of lofty buildings introduced is remarkable. We may in this country criticise unfavourably the excessive height, as if the whole question was one of style. But it should be remembered that in New York, as in London, business is concentrated within a very limited area, and the owners of the ground naturally desire to derive as much revenue as possible from their property. The Otis elevators have removed all the difficulties that used to belong to height. The use made of them is suggested by the plan of the Havemeyer Building, in which seven elevators are seen. The Morse Building may be considered as being the earliest of the modern high buildings, but offices are in course of erection for the American Tract Society which will be double the height. What makes the buildings possible and profitable is the abundant and rapid elevator service, so that any tenant entering a building, or a visitor intending to call upon an attendant, is sure of an instant and very rapid transit to the floor desired. It is also the practice for a certain number of elevators to make no stop below a certain floor, so that persons seeking the upper floors would take what might be called an express elevator, which would not stop, say, before the tenth floor, and thereafter as might be required. No less remarkable is the safety with which the countless journeys are accomplished by the Otis elevator.

ENGINEERING CONSTRUCTION.*

IF iron and steel were endowed with voices they could set up a claim not only to pre-eminence as materials of construction, but as having inspired more books than all other materials during the last half century. It is only necessary to compare a list of engineering books which appeared before and after the publication of EDWIN CLARK'S work on the Britannia Bridge as evidence to support the assertion. That structure soon became as obsolete as one of the pyramids. A bridge or beam with a continuous web seemed to be no more than a makeshift to provide against contingencies. It was an admission of the certainty of strains, but as no one could tell in what direction they operated, the only way to insure safety was to provide as much material as possible where they could operate. BRUNEL, with his customary daring, erected a sort of truss bridge which still serves its purpose, but as his reputation for economical construction was on the wane, his Chepstow Bridge was not accepted as the germ of a new system. It was considered that something could be gained by substituting a lattice for a solid web, and an effort was also made to reduce expense by employing cast-iron along with wrought-iron. The Americans were, however, compelled to practise a more rigid sort of economy, and they were as little able to afford to span their valleys with English lattice bridges as with bridges of the type of STEPHENSON'S Victoria Bridge across the St. Lawrence. They deserve the credit for first introducing truss bridges on a grand scale and for showing their fitness to carry railways over rivers and chasms where construction of any kind might be supposed to be an impossibility. Mr. RUSKIN at one time sneered at railways by saying that by their aid man was only emulating the gnat; if he could have seen some of the American bridges he might have added that they were mere imitations of the spider's web.

The truss bridge, having demonstrated that it was both safe and economical, began to exercise a sort of fascination over engineers. Bow, of Edinburgh, devised a couple of hundreds of varieties of bracing, which to many of the old school were no more than exercises of imagination; but they were soon surpassed in number and complexity in America. Every new firm of bridge-makers was expected to have its own special systems, and as the country was wide there was room for them all. An impetus was therefore given to the study of principles, and in consequence an immense number of books made their appearance.

Some centuries hence philosophers will probably be found who will be able to demonstrate that the truss bridge is as representative of the end of the nineteenth century as any of the old French and English cathedrals were of the Middle Ages. It is the type of utilitarianism—or shall we say of state socialism? Every part has its function, and cannot help performing it. There are no superfluities, for material is not employed for the sake of appearance. A margin of strength has to be allowed—or rather is insisted on by public authorities; but it is solely on the understanding that contingencies may arise when that material must exert itself. There is no concession to conventionalism. People who have derived their notions of construction from antiquated examples wonder why iron and steel bridges are not ornamental. With as much reason they might object to mathematical and chemical formula, because there is nothing rhetorical or impassioned about them. As long as the bridges are severely scientific they have a character which demands respect. When an effort is made to transform them into something else they become despicable. Every Londoner who passes under the railway bridge across Ludgate Hill receives a lesson about the absurdity of an endeavour to make an iron bridge ornamental, and in other places more repelling examples are to be found.

It is an advantage in Professor WARREN'S book that he does not attempt to delude a student by suggesting that construction in iron, steel and timber can be made to vie with construction in stone for architectural effect. When he refers to stone, brick or concrete, it is about the capacity to resist stresses and similar problems. The book was, we suppose, primarily intended for colonial students who

cannot at all times have a supply of drawings at hand, and therefore care has been taken to give ample descriptions of a great many structures. The author says:—"The special feature of the work lies in the various examples which illustrate the design of the most important classes of structures in iron, steel and timber; these have all been selected from existing works. The author's experience in teaching has convinced him of the necessity of thoroughly illustrating the various principles underlying the theory and practice of construction, and the student is never certain whether he understands these principles or not until he has attempted to apply them."

The colonial origin of the book is also suggested by the appropriation of a part to construction in timber. That is interesting, because timber trusses are of ancient date, although they may not have inspired the employment of steel. But the pages also reveal in a brief form the advantages possessed by the Australians in having stronger timber than is available in other parts of the world. Professor WARREN says he has tested the tensile strength of nearly all the varieties of Australian timber. He found that while red pine and spruce had a tensile strength of about 10,000 lbs. per square inch, most of the Australian timber exceeded 20,000 lbs. per square inch. The compressive strength was no less remarkable, but it is observed that "Australian timber is liable to decay at the heart and form a pipe, the area of which must be deducted from the area of the log in calculating the strength." The shearing strength of Australian timber is much in excess of any that is found in America. Professor WARREN says that "the strength and durability of Australian timber are greater for winter than for summer felled timber, and the strength is greater in seasoned than in unseasoned timber; but experiments prove that natural seasoning is better than either kiln-drying or steaming. The average life of timber bridges in Australia is about 25 years."

The observations on timber which we have copied are suggestive of the character of the book. It deals with "Engineering Construction." A great part of it treats about strains, elasticity, moments of resistance, and the like, in the abstract, but only as subservient to construction. The practical information is not of the stereotyped kind. The difficulties which the Australian engineer has to encounter and overcome are not unlike those which arose before now in America, and accordingly Professor WARREN gives as much attention to what has been accomplished in the States as he does to English practice. His book, in consequence, has a sort of freshness which is welcome to the student of engineering literature in this country. The information given is sometimes curious, especially when it relates to particulars which are passed over in English treatises. For instance, we are told that "experiments made by the United States Government show that smooth rods have a greater holding power than ragged ones; that the resistance ten months after being driven is 10 per cent. greater than the resistance immediately after driving; that round drift bolts are 25 per cent. more efficient per pound of metal than square ones." A more exact notion of the author's method of treatment may be derived from the following passage in the chapter on "Wind Pressure":—

The British Board of Trade rules require that bridges in exposed situations should be calculated for 56 lbs. per square foot, and this pressure is to be considered to act over twice the area exposed by the girder, the resistance to be provided by the dead weight of the structure. In the present state of our knowledge of wind pressures on structures, it is only possible to estimate roughly the loads which may be expected. The experiments of Sir B. Baker, although probably the most valuable for our purpose, require to be extended considerably before the wind loads on structures can be estimated as accurately as the ordinary live or dead loads. The importance of the subject in connection with the design of large structures may be realised by a consideration of Sir B. Baker's estimate of the stresses in the Forth Bridge, which are as follows:—

Stresses due to dead load	2,228 tons
" " live "	1,022 "
" " wind "	2,920 "

The pressures deduced from anemometer experiments are for an instant only, and do not represent the pressure at the same instant over a large structure such as a bridge, the maximum pressures being due to gusts in advance on the main body of the moving mass of air. It is known, however, that the velocity of the wind is greater the higher the surface exposed is from the ground, and Rankine has deduced the greatest average pressure which could be realised on tall chimneys as 55 lbs. per square foot. By calculating the overturning moment of

* *Engineering Construction in Iron, Steel and Timber.* By W. H. Warren Challis, Professor of Civil and Mechanical Engineering, University of Sydney. Longmans, Green & Co.

railway carriages and trucks, it is clear that the average wind pressure on the surface exposed in such cases but rarely exceeds 30 lbs. per square foot, as only in very exposed situations, and under exceptionally strong winds, have railway vehicles been overturned. Since 30 lbs. would overturn most of the rolling-stock on existing railways, it is not necessary to estimate a greater pressure on the exposed surfaces of a bridge and train, although a greater pressure may be allowed on the bridge itself without the train. The correct estimate of the exposed surface is very important, and the amount of shelter afforded by the truss on the wind side to the truss on the lee side. As the pressure of wind on structures which rise a considerable distance above the ground is greater in proportion to the height above the ground, tall chimneys, piers of viaducts, Eiffel towers, &c., may be calculated for from 50 to 56 lbs. per square foot of exposed surface for heights above 100 feet; the first 100 feet may be calculated for 40 lbs. In a circular chimney the surface exposed is equivalent to a flat surface, the width of which is half the diameter of the chimney. In braced piers, towers and bridges, in order to allow for the effect of the wind on the lee side, the area on the exposed side should be multiplied by two. The American practice in estimating the force of wind over bridges is as follows:—The train surface is taken as 10 square feet for every foot in length, and the pressure of wind at 30 lbs. per square foot, or 300 lbs. per lineal foot of train, which must be added to the exposed area of the truss in square feet multiplied by 30 lbs. The former is treated as a moving load and the latter as a fixed load. The bridge is also calculated for the case when the train is not on the bridge by multiplying the exposed surface by 50 lbs. per square foot. The maximum stresses produced by either method of loading are used for designing the wind bracing.

Professor WARREN deals with all the structures of iron, steel and timber which are commonly designed by civil engineers. As he treats questions of strength by calculation as well as by graphics, the book will not only help in preparing designs, but shows how one process can be made to verify another. In new countries and in districts which are remote from libraries the advantages of the author's treatment will be felt by young engineers. For those who have not been able to obtain systematic instruction in the principles of design, or for students who are desirous to supplement the lessons of the classroom, the volume will be found an efficient aid. It is to be hoped the author will soon be enabled to bring out the companion volume, which will treat of brickwork, masonry and concrete.

HORSHAM PARISH CHURCH.*

IN common with several of the surrounding parishes, no mention is made in Domesday Book of any church existing when that work was compiled, and the first record of the existence of a church at Horsham occurs in 1229, when John de Braose conferred the impropriation on the prioress and nuns of the priory at Ruspur, an adjacent convent then recently founded. The charter of endowment on this occasion was granted by Ralph Neville, Bishop of Chichester, in 1231, and confirmed by his successor, Stephen Berkstead, in 1281. The deed above mentioned shows clearly that either an edifice of some importance was then in existence, or immediately contemplated, as it provides that the vicar should have "one chaplain as his assistant and two subordinate ministers, namely, a deacon and subdeacon, to officiate with him in the same church." In fact, the town of Horsham had attained some importance at the close of the thirteenth century, at which period we meet with the first record of the return of a member of Parliament for the borough. The donation ordains that the prioress and nuns should receive the whole tithes of corn, &c., and the vicar the small tithes and the altar offerings. Mention is made of the benefice in the accounts of the taxation of Pope Nicholas in 1291. In 1307 the Trinity Chapel on the north side of the nave was founded by Walter Burgess, and in 1341 the Nona Roll, which includes Sussex, but not Kent or Surrey, gives the worth of the living as being of the total sum of 13*l.* 6*s.* 8*d.*, or twenty marks; this return was made on the oaths of four of the leading parishioners. In 1447 license was given to found a chantry, afterwards called "Butler's Chantry," at the altar of St. Nicholas, which Mr. Cooper says was in the northern aisle of the chancel, finally called Roughtey Chantry. He adds that the chantry priest's house was sold in 1550 to Edward Sucknor. There is still a house near the churchyard called the chantry house, and it probably replaces the one above referred to.

A brotherhood or guild was formed in 1457 by several inhabitants of Horsham, among whom we find the names of Agate, Lintott, Mitchell, Potter and Waller, all names still well-known and respected in our town, after a period of more than four hundred years. The guild was dedicated to St. John Baptist and St. Anne, and masses were said for the welfare of

the members at the altar of the former saint, who was extremely popular in the Middle Ages. The fraternity had somewhat of the nature of a modern benefit society, and possessed two houses inhabited by poor persons rent free. Mention is made in 1548 of the brotherhood house in North Street, and at the same date the guild held a croft in South Street, which probably gave the name of Tanbridge to the spot now so called in the Worthing Road, as St. Anne, corruptly known as "Tan," was the patroness of the society. Doubtless, as in other guilds and companies, there were convivial meetings of the members, as we find that in 1521 Richard Nutley, of Horsham, bequeathed a nine-gallon brass pot to the brotherhood of St. John and St. Anne. Similar guilds existed in Sussex at Chichester, Donnington, East Bourne, East Grinstead, Pagham and Steyning.

In 1534, at the dissolution of Ruspur Priory, the rectorial tithes were leased to Thomas Thurley and Thomas Mitchell for sixty years; at the end of the term they passed to Robert Southwell and his wife Margaret. James I. conferred them on Mr. Bostock, of East Grinstead; they then passed through the hands of the Wicker and Broughton families, and finally into those of the Hursts, with whom the rectorial rights now remain. At the suppression of Ruspur Priory the patronage of the vicarage was granted to the Archbishop of Canterbury, whose successors have held it ever since. The troubles of the sixteenth century appear to have affected the ecclesiastical history of Horsham Church in a very slight manner. But in the seventeenth the Puritan party dispossessed the vicar, and appointed a Mr. Chatfield their lecturer, as we are informed in Miss Hurst's "History of Horsham," though one esteemed member, Mr. Phillips, calls my attention to certain marks on the west front of the tower, which are traditionally said to have been made by the Cromwellians, and he also informs me that similar holes are to be found on the tower at Hailsham, and are likewise attributed to the Republicans of the seventeenth century.

Having presented my hearers with a concise history of the ecclesiastical events connected with our church, a few remarks may be made on the history of the fabric itself. I think there can be little doubt that a church of some importance existed in Norman times, but of this edifice we have no records left. In the thirteenth century the present nave, aisles and chancel were erected; in the fourteenth the north porch and chapel; whilst the fifteenth and the early part of the sixteenth centuries saw the erection of the south chapel and the two-storeyed vestry. No alteration in the fabric of the church took place until the year 1864, when, extensive repairs being necessary, they were not only taken in hand, but important additions and alterations were made. The plan before us shows the church as it existed previous to the above date. Of the church which was here before the almost total rebuilding in the thirteenth century we have only the lower part of the tower left us, and a doorway which has been shifted from its original position in the north aisle in 1864, and a small Norman lancet, which is, perhaps, an old one. It has been said that Norman towers were nearly always central; that is to say, placed between the nave and chancel. This is quite an unsupported assertion. Not only is the tower of Horsham a western one, but we have several undoubted Norman western towers in Sussex, as at Feltham and Seaford. It will be noted that the tower stands south of the present nave, and not in the centre of the west wall. This shows the greater age of the tower and that the former nave was narrower by about 3 feet than the present one. The reason for this statement is that when a nave was widened or an aisle or chapel added, it was usual in the Middle Ages to take the additional space required from the ground north of the church, and not from that south of the edifice, where the graves of the departed chiefly lay. The repugnance against being buried on the north side of a church is well known, and is, I believe, still strong in many places, especially, I am told, in Warwickshire, and an old print of Horsham Church shows very few graves north of the building. The tower arch appears to have Norman jambs, over which an Early English arch has been awkwardly placed, and the plain character of the upper part of the campanile would indicate that it is of a date anterior to the noble nave and chancel. The lofty shingled spire is one among many such in Sussex, and there are two in the immediate vicinity—at Billingshurst and Wisborough Green. The west lancet is modern. The nave of our church is supposed to have been erected at the expense of the parishioners, the chancel at that of the nuns of Ruspur, the result being the very beautiful church in which we are assembled.

The plan presents some remarkable features, of which perhaps the most striking is the omission of the chancel arch and of the cross arches of the chapels. This omission is seldom met with before the fourteenth century, at which period we have an example at Fratton. The continuation of the aisles to the extreme east end is rare in parish churches of the thirteenth-century date, but is seen at Eastbourne. Lastly, the continuous clerestory is a noteworthy feature in an early Pointed parish church not cruciform. The architect, it will be seen, depended entirely on beauty of proportion for the success

* A paper read by Mr. J. Lewis André, F.S.A., at the annual meeting of the Sussex Archaeological Society.

of his design, as here we have a simplicity of conception worthy of a Cistercian abbey in the plainness of its details. Here are no marble shafts, no rich mouldings, no floriated capitals, and yet the effect of the whole produces an impression of great dignity, and in no way suggestive of parsimony in outlay or poverty in design. In planning the chancel a geometrical proportion has been followed, as the space between each pier is equal to half the width of the choir; this is not observed in the nave except in the easternmost bay. The nave arches have no labels over them in the body of the church, but those in the chancel have them, with peculiar little heads at the points of the labels. The chancel clerestory lancets are also slightly richer externally than those of the nave. The bases of the nave have carvings at their junctions, with their square plinths, as at Donnington, but those appear to be modern. At the east end there was originally a triplet of lancets, of which fragments were found in 1864. The lancets now in the outer walls are either entirely modern or restored from indications discovered at the same date. Externally we see two pinnacled turrets at the east end of the clerestory. These were not entirely ornamental adjuncts, but designed to counteract the thrust of the arcades. Although there were the northern entrances to the north side of the church, there appear to have been none in the south, a peculiarity found in several Sussex examples, as at Clayton, Framfield and Ifield. Early in the fourteenth century two coupled two-light windows were placed in the north wall, an unusual feature, but of which there still remains an example at Kenilworth, Warwickshire; the one here perished in 1864. Soon after the insertion of this window the large north porch and the chapel connected with it were added; a somewhat similar arrangement of porch and chantry may be noticed at Rye. Here, at Horsham, under the east end of the chapel, was constructed a vaulted chamber, partly above and partly below the ground. There is, I think, little doubt as to its use, namely, as a receptacle for the bones found in the cemetery. There is a like contrivance in the south aisles at Bosham, and some large churches had a building quite apart from the main structure devoted to this purpose, as at Norwich Cathedral and St. Margaret's, King's Lynn. The outer doorway of the porch is ancient, and has by its sides two very singular unglazed lancets, set low down and of no use for lighting, but which appear to me to have been used for confessional purposes. The beautiful chapel windows are correct restorations of the original openings.

About 1350 a three-light window of neat traceried pattern was placed in the south wall and a rood-screen erected, of which more further on. The screen perished in 1826, the window in 1864. In the fifteenth century the eastern lancets of the chancel were displaced to make way for a large Perpendicular window similar in design to the one before us. Other windows were also inserted in the south aisle. Later on, in the same century, the south chapel was built, an addition calling for no special remarks. At the same period, however, the roofs throughout were replaced by others with tie-beams and of waggon-shaped panelling; of these much remain in the present roofing. The cornice to the chancel and the carved bosses, which are in some cases old and in others faithfully copied from the originals, are all worth notice.

The last structural addition was the erection of the two-storeyed vestry north of the church. Vestries of more than one storey are rare, but there is one very similar to this at Hamstead, Hertfordshire. The external doorway is quite modern, all old vestries being entered from the inside of the church only. Like the adjacent churches of Rusper, Shipley and Warnham, Horsham Church was dedicated to the Blessed Virgin Mary, but it is not easy to fix the position of the altars formerly existing. The north chapel was dedicated to the Trinity, and I think the altar of St. Nicholas was at the end of the north aisle of the choir; St. John Baptist appears to have had an altar at the end of the south aisle, and St. Michael one in the south chapel. The piscina of the high, or master altar, as the French term it, remains, but in a much restored state; its position in the east wall was occasioned by the arcades running to the extreme end of the chancel. A plain piscina in the north aisle of the choir was similarly compelled to be in the respond or east column—an unusual position. Trinity Chapel has also a piscina now in the east wall; one in the south chapel also remains. The font is a plain specimen of late fifteenth-century art, and the bowl rests on a modern shaft. I need hardly say it is not in its original place. The rood-screen had openings of trefoil headed arches or circular columns, and had figures of saints painted on its panels and was otherwise richly gilt and embellished. The rood-beam probably rested on the octagonal strips of masonry at the junction of the nave and chancel; a similar arrangement is seen at Great Stamburgh, Essex, the only other example I have met with, though in many cases the rood-beam was quite independent of the screen beneath it, as at Temstead, Norfolk.

In the fifteenth century the walls of the nave were painted with various scriptural scenes. The north wall, which then entirely cut off the Holy Trinity Chapel from the rest of the

church, was covered with a series of incidents in the Passion, whilst the west wall was ornamented with the Annunciation and the Last Supper. These last have been repainted as we now see them, but with little regard to the ancient pictures, which were extremely rude and inartistic, though I trust that Mr. Honeywood exaggerated their faults in the sketches which he made and which I am enabled to exhibit to you. One of the subjects was, I believe, our Lord between SS. Peter and Paul, of which we have an undoubted example at West Meston. If this surmise is correct it is somewhat remarkable, as this symbolical representation is often found in early Christian art, but not so in that of the Middle Ages. The scene of the Last Supper in the old work showed the table-cloth looped up with flowers, a custom I am informed still kept up in Germany at family festivals, such as birthdays and marriages. The decorations of the main roofs are I believe a correct reproduction of the original work, and Dallaway informs us that there was a text in letters a foot long, placed under the cornices, but which had been deliberately destroyed before he wrote. The south chapel roof is likewise decorated in colour, but the vulgar-looking shields at the ends of the hammer-beams are modern, probably replacing busts of angels. None of the ancient stained-glass remains, but a visitation book of Philpot and Owen, made in 1634, gives a list of the coats of arms then to be seen in the large east window and those of the south aisle. There is a remarkable old chest of large size in the upper vestry, and which from its dimensions must have been put together in that apartment. Many of the old pews had panels of coarse Jacobean carving, one or two of which will be found worked up into the present sedilia in the sanctuary. The tower contains eight bells, weighing 23 cwt. 3 qrs. 16 lbs. Three are dated 1752, two 1815, one 1838, and there are two undated. It is interesting to observe that the curfew was daily rung until 1891.

In conclusion a few words must be devoted to the very interesting monuments which still remain here, though unfortunately many perished at the time of the alterations forty years ago. The fine high tomb now on the south side of the chancel justly claims our attention. It commemorates Thomas de Braose, a knight who died on September 2, 1395. He married a lady whose christian name was Margaret, but whose surname does not appear to be known. They had two children, who, sad to say, died in little more than a month after the decease of their father. The widow married twice, and died in 1446. This fine effigy is a good example of military costume, and it is noteworthy that the three adjacent churches of Horsham, Ifield and Horley each possess an excellent knightly monument. The shields round the tomb bear the arms of De Braose, D'Aubeney, Bigod, Clare, Clifford, Molyneux and others. On the floor of the chancel is a mutilated brass effigy of a priest in alb, stole, maniple and cope—a very unusual combination of ecclesiastical vestments, of which there are only two other examples in English monumental brasses, but not unfrequently seen in pictures of the early masters. The brass has the initials "T.C." on the orphrey of the cope, and is supposed to commemorate Thomas Clarke, a vicar here, who died in 1441, and with which date the work corresponds. A figure of a lady will be seen in the vestry. It is a fragment of a brass in memory of Richard Foyes and of his wife Elizabeth; he died on April 22, 1513. The canopied tomb on the north side of the chancel was erected to the memory of Thomas Hoo, half-brother of Thomas Hoo, Lord of Hoo and Hastings, who was an ancestor of the unfortunate Anne Boleyn. The Thomas here commemorated represented the county of Sussex in Parliament in 1446 and 1448 and the borough of Horsham in 1472. He was a staunch Lancastrian, and was employed in some important matters by Henry VI. He died October 8, 1486, and left no issue. The tomb is in the very latest style of Gothic art, and at present bears no inscription. The brass enamelled shields had perished before 1634. There is a tradition that Queen Elizabeth caused this monument to be repaired, which has some probability, as she was related to Thomas Hoo through her mother's family. The flat slab under the canopy, and the position of the tomb, suggest that it may have been also intended as an Easter sepulchre. The very beautiful monument, now placed against the south wall, but formerly standing quite detached, commemorates Mrs. Elizabeth Delves, a daughter of Hall Ravenscroft, Esq., and wife of Thomas Delves, Esq., son and heir-apparent to Sir Henry Delves, of Dodington, Cheshire, Baronet, the baronetcy being now extinct. Mrs. Delves died December 2, 1654, about twenty-five years of age. Dallaway states that the beautiful recumbent effigy is a "work of Francis Fanelli, one of the most celebrated sculptors of his day." The same author records monuments for members of the Eversfield, Gresham, Mitchell, Tredcroft and many other families, in all thirty-nine in number, many of which have now disappeared. Among the memorials was one of Sir Bysshe Shelley, Bart., who died January 6, 1815, aged eighty-three, and other slabs, one for his wife, Mary Catherine, and another for Catherine, their daughter. A plain slab has been fixed recently in the tower to com-

memorate the poet Shelley, who was born in the adjacent village of Warnham. Dallaway records twenty-nine other memorials besides those named above, and most of which have entirely perished. A helmet and crest will be found at the east end of the south chapel.

FLINT IMPLEMENTS IN NORTH KENT.

AN important discussion took place at the meeting of the British Association at Oxford, in which the sections of anthropology and geology combined for the occasion, concerning the plateau flint implements in North Kent.

Professor T. Rupert Jones, F.R.S., said the subject had been fully treated by Professor Prestwich in memoirs which elucidated the general geology of the local drift-deposits, the geological stages of their formation, and the peculiar flint implements of the plateau. He has shown that certain superficial soils on the North Downs between Sevenoaks and Rochester contain numerous rudely worked flints, discovered by Mr. B. Harrison; and that these were derived from a gravel of very great antiquity, originally formed on the side of the old Wealden Hill range or mountain, which once rose about 3,000 feet above where Crowborough and other hills in Sussex now are. Man existed at the time of these gravels, and used the flints for tools. These gravels and the implements left in them were removed by natural agencies, such as rain, rivers, sea, frost and ice, and distributed by torrential streams on the chalk slopes (now part of the North Downs) at a lower level on the flanks of the range. These rude old flint implements have an ochreous colouring, due to ferruginous gravel whence they came, and are now found on the plateau, sometimes with limited patches of some of the ochreous flint gravel, together with tertiary pebbles, less-worn flints, and fragments of lower greensand, on the red "clay-with-flints" covering the chalk. It is shown how desirable systematic excavations, to prove the extent and thickness of the implementiferous soil, would be. Professor Prestwich's history of the origin of the ancient Wealden dome, island and hill ranges, and of the gradual destruction of those uplands in the course of untold ages, with the resulting formation and removal of successive geological groups of strata, such as the Thanet sands, Woolwich and Reading beds, London clay, Lenham beds, and the old ferruginous gravel with its rude implements above mentioned, are noticed in detail. The Diestian or Lenham beds were formed in the early pliocene period, and the denudation of Holmesdale probably began directly afterwards, at about the time of the red or the Chillesford crag, in lake-pliocene or in post-pliocene times; and the old ferruginous gravel had not only been formed, but washed away to a lower level before that time. The ultimate denudation of the valley cutting off the chalk from the Weald being subsequent to the formation and removal of that gravel, the latter must have been pre-glacial in age.

Mr. Whitaker said that the flints exhibited might be divided into two classes, the few that would be allowed by every qualified observer to be the work of man, and the many as to the authenticity of which judgment should be deferred. He then alluded to the two points of view from which the subject was approached—the anthropological and the geological. In the former the work of man was the starting-point; but, as a geologist, he thought that nature should be duly considered, and the varied way in which she worked, sometimes leading to results that were somewhat unexpected. The district in question, too, was of a double character. In the first place, we had to do with a tract, south of the chalk range, over which there were in parts beds of gravel, sometimes along the courses of the stream valleys, but sometimes having no connection with the present drainage system. In the latter case the composition and position of the gravel seemed to point to a time when the features of the country were not the same as now, when the streams ran in different courses, and when the chalk escarpment, and other similar ranges of hill, reached further south than now. He pointed out that the district was at and near the watershed between the Medway and the Darent, and that in such a position alterations in the flow of streams could be brought about by smaller causes than lower down along the river valleys. The other part of the district was along and north of the great chalk range, and the deposit here mostly met with over the chalk could not properly be called drift; it had not been brought into its present position from elsewhere, by sea, river, or ice, but had grown where it stood; it was a residuum, the matter left from long-continued gradual dissolution of the chalk and the leaving behind of its flints and other insoluble matter, to which was added a mass of loam, resulting presumably from the remains of old tertiary beds. With regard to the gravels, flint implements of undoubted workmanship having been found in them, it must be conceded that man existed at the time of the deposition of those gravels. This certainly carried man back locally at all events beyond the time of the river gravels, which occur in the bottoms and

along the slopes of the valleys. He could not admit, however, that there was any good evidence to connect these ancient men with pre-glacial or even with glacial times, as there were no deposits of undoubted glacial age in or near the district. Over the clay-with-flints of the chalk tract many implements had been found, but these were on the surface, and therefore we had no evidence of their age other than that given by their form. He understood that it had been said that a very few implements had been found in the clay; but even were it so we should be little wiser as to their age, the formation of the said clay having continued over a long time right down to the present day. Elsewhere implements had been found in a brick-earth that was associated with the clay-with-flints; but in this case we were still ignorant of the age of the deposit, no other bed having been found above. He thought that in such a matter great caution was needed lest observers should be carried away by their zeal in discovery, and that the right spirit was to approach the question with wholesome doubt, contesting the views of those whose faith led them to believe very ordinary looking chippings to be the work of design, so that they should have to prove that the balance of probabilities was in favour of their view.

Mr. Montgomerie Bell confined his remarks to the anthropological part of the question, and proceeded to give reasons why the collections of flints from the plateau-gravels showed evidence of human handiwork. He produced implements with a hollow curve in the side, which are found in all successive periods of flint-using man, and were used for rounding pieces of wood or bone. Why the type from the plateau-gravel should be rejected because the flint did not possess other qualifications, he could not see. He next pointed out how some flints were worked symmetrically all round, and asked how nature could work in such a way. The real point was not whether some particular and well-known style of working flint was present, but whether order, regularity and purpose were visible in the working, for these were the traces of reasoning and of man. Next, the points of similarity between the primitive and common river-valley type were touched upon, the same shapes, the same curves, the same flaking were to be seen, although in ruder forms. His final conclusion was that all the evidence pointed to the working of a race of men with strongly-developed body but weakly-developed mind, and that this was exactly the conclusion which we should expect to find. The actual geological date of these drifts seemed to him unimportant, though, in his opinion, they belonged to pre-glacial or pliocene time. The great dispersion of man in quaternary times made his pre-existence a logical necessity; to find his actual relics here or there was no doubt an additional satisfaction, and, considering what that lapse of time meant, and that even flint was worn by time, we should not expect the relics of such an age to be in themselves artistic or their material to be in a brand-new and easily recognisable condition.

Sir John Evans inquired whether implements of the ordinary palæolithic type had not been found in the plateau deposits, and was answered in the affirmative. Agreeing in the main with the statement as to the geological features of the case, he pointed out that any intervention of a glacial period, as suggested by Professor Rupert Jones, was inadmissible, while the evidence as to the palæolithic age in Suffolk being locally post-glacial was irrefragable. The principal outcome of the recent discoveries was, to his mind, the fact that the existence of palæolithic man could be carried further back in time than the valley gravels, inasmuch as they are now found in gravels on the plateaux at far higher levels. He could not regard Kent as the cradle of the human race, nor care to trace the development of its stone implements from flints of natural forms. The endeavours to enlarge the catalogue of implements in use in palæolithic times he regarded as praiseworthy, but any inference drawn as to the co-existence of two races of men in Kent in those early times seemed to him absolutely unfounded.

Dr. H. Hicks said he had much pleasure in supporting the views of Professor Prestwich. In following Sir J. Evans he was reminded of the many discussions in which they had taken opposite views on the question of pre-glacial or glacial man during the past ten years, and it was a great satisfaction to him to find that Sir John Evans was now prepared to assign a much higher antiquity to man than he had previously been inclined to do. It was well known that until a comparatively few years ago Professor Prestwich had shown much caution in giving man the antiquity that he now did, and he had stated that he had come to the conclusion largely owing to the researches of Mr. Tiddeman in the Yorkshire caves and to those which he himself had carried on in the caves of North Wales. Mr. Tiddeman was certainly the first in this country to claim that implements fabricated by man occurred under typical boulder clay. Dr. Hicks said further that for the past ten years he had been collecting evidence in the South of England to see whether there were any facts available which would be of service in showing that man occupied that area in glacial or in pre-glacial times, and he was perfectly satisfied, from

evidence which he had personally obtained from the gravels on the South Downs and also from the Hertfordshire hills, that man had occupied that area before the close of the glacial period. Evidence, which he would refer to more fully in another section, had been recently obtained which proved that flint implements containing very distinct evidence of having been worked by man occurred also in the subangular gravel underlying the chalky boulder clay at Whetstone, Finchley and Hendon.

Professor Boyd Dawkins pointed out that the question before the meeting was not the evolution of palæolithic culture of the human race, but the age of the high plateau-gravels, in which and on which flint implements are met with. In the course of the debate it had been amply proved that these deposits are not of such high geological antiquity as to be out of the range of the palæolithic period, the characteristic implements of which occur on and below the surface. The argument that the ruder implements are older than the higher types found along with them was negated by the repeated discoveries of all the forms in question in the same deposits in caverns underneath the stalagmite, such as those of Cresswell. He agreed with the views of Sir John Evans as to the implements, and with Mr. Whitaker as to the geology. In his opinion neither wear nor stain is of importance in fixing age; they are merely local accidents. He was unable to take the existence of man in North Wales and in the area of London in pre-glacial times as otherwise than non-proven, and he knew of no proof of pre-glacial man in any part of the world.

General Pitt-Rivers said that he did not think the authors of this ingenious idea had added much towards proving their position since the subject was brought before the Anthropological Institute some short time ago. He was quite of opinion that some ruder implements than the tongue-shaped flints of the drift must have been used by earlier races of men which had led up to them, and, on the other hand, he had, some twenty-five years ago, published a diagram in which he ventured to show that many connecting links could be found between these tongue-shaped implements and the neolithic flint celt of the surface period. But he did not think the majority of the stones exhibited were of artificial fabrication; some of them were, but not all. He disagreed with one of the speakers in thinking that a single bulb of percussion was sufficient to prove human workmanship. The bulb of percussion on a facet shows the direction in which the blow was given, but any hard knock would produce it. What was wanted to prove design was to have two or three blows at least given in the same or some definite direction, so as to show continuous evidence of design on the part of the fabricator. He thought that the hollow scrapers exhibited might have been formed by taking up a sharp-edged flint and scraping a round substance or stick with it. The flint in this process flakes off so as to form sharp edges and facets in a concave shape, exactly as if they were purposely formed. He thought the geological evidence was more or less shaky, but on that subject the opinion of so many experienced geologists had already been given, and he would not therefore occupy the attention of the meeting upon that point.

Sir Henry Howorth said there are only two geological barometers which are trustworthy—superposition and the presence or absence of certain extinct or domesticated animals. In the absence of these criteria it is most unsafe to discriminate between the different classes of stone implements and especially to attach any special age to surface finds. The only evidence available for testing the relative age of the plateaux-gravels goes to show what Dr. Hicks and himself had fought for years, namely, that they are older than the distribution of the so-called glacial drift. The gravels are of two kinds—one water-worn and round, the other angular. The pebbles of the rounded gravel are probably due to the disintegration of much older beds of tertiary or secondary age. The trituration of the stones in these gravels and their distribution belong to two different stages of the problem. This distribution, like the distribution of the angular drift (which has to be explained on the other side of the Channel as well as on this), cannot be explained by any subaerial decay of the surface or by any fluvial agency, since surface disintegration cannot explain the formation of these angular flints, nor can rivers explain the spread of the gravels which occur continuously in unbroken sheets in an undulating country. They mantle the surface irrespective of its drainage in a wide district where there is no gathering ground for large rivers. The facts, as Mr. Flower and Professor Prestwich have strongly urged, are only consistent with the implement-bearing gravels of the plateaux having been distributed by a widespread diluvial force, and with their belonging to a horizon underlying the so-called glacial drift.

Mr. Clement Reid questioned the extreme antiquity of the implements, pointing out that careful search had led to no discoveries in undoubted pliocene and pre-glacial deposits.

Colonel H. H. Godwin thought the chopping of the ruder forms might be due under cold conditions to what he had seen

himself on the steep ice slopes in the larger glaciers of the Himalayas. Capping these cliffs are thick accumulations of more or less subangular gravel. During the night stones get frozen into the crevices of the face of the ice; as soon as the temperature rises showers of stones fall down the slopes often 40 feet and 50 feet, and are quite capable of striking off flakes on the edges of the fixed stones. This example might be carried to the slopes of frozen mud and gravel on the sides or vicinity of the ice.

TESSERÆ.

The Romans in Art.

THE architectural achievements of the Romans deserve the greatest admiration. The Greeks have the boast of having formed their temple from an idea so that everything was in keeping, but the Romans, although they did not invent new forms, had the wit to develop and combine existing forms so as to supply appropriately the demands of an Imperial city, the capital of the world. They managed to solve the discord between columns and arches and used them together. The taste of the Romans was not so delicate as that of the Greeks, who always managed to hit the happy mean between too much simplicity and over-elaboration; the Romans pile on all sorts of ornament to increase the effect, but they surpass the Greeks in their management of large spaces, for their buildings were practically unlimited in size, and became models for imitation owing to the ingenuity of the grouping together of large and small rooms, so that each should be in the right place and serve its purpose, and yet be subordinate to the effect of the whole. A great architect and archaeologist has said that the art of building in Imperial Rome was the art of ruling the world expressed in stone. In sculpture the Romans achieved very much less; indeed they hardly played any independent part in it except in portraits and historical scenes, and in this narrow field they remained under Greek influence, so that their efforts exhibit grace and even beauty as well as truth to nature. They certainly, however, have the merit of having provided a place of refuge for Greek artists when the earlier order of things was destroyed; and when they stole treasures from Greek cities to bring to Rome they were thereby the means of preserving them for a long time from destruction. Most of the Greek originals were lost in the storms of the Middle Ages, but innumerable imitations had been made by artists of technical excellence, so that Rome shone in a sort of reflected lustre of Greek beauty, which, before the Greek soil began to yield up some of the treasures concealed in its depths to modern investigators, had more than once raised and ennobled the debased taste of the civilised world.

Monge and Descriptive Geometry.

The father of the great mathematician was an innkeeper, who was described by Madame Roland as a "maçon parvenu." At fifteen he went to the college of Lyon to study natural philosophy, and in the following year he was employed to teach it. Afterwards he obtained an appointment as teacher in the military college at Mezières, where he remained till 1780, when he was appointed professor-adjoint with Bossut, in teaching hydrodynamics at the Louvre. During his stay at Mezières, observing that all the operations connected with the construction of plans of fortification were conducted by long arithmetical processes, he substituted a geometrical method, which the commandant at first refused even to look at, so short was the time in which it could be practised. It was, however, received with avidity when further inspected, and Monge, continuing his investigations, soon generalised the methods employed into that great alphabet of the application of geometry to the arts which is now called descriptive geometry. Such, however, was the system of the French schools before the Revolution, that the officers who had been trained in this application were strictly forbidden to communicate its methods even to those who were engaged in other branches of the public service. Monge himself, in 1780, conversing with his pupils Lacroix and Gayvernon, was obliged to say, "All that I have here done by calculation I could have done with the ruler and compass; but I am not allowed to reveal these secrets to you." But Lacroix set himself to examine how this could be, detected the processes employed, and published them in 1795, under the title of "Compléments de Géométrie." The method was published by Monge himself, first in the form in which the shorthand writers took them down from the instructions given at the Normal School, also in the collected edition of the "Leçons de l'Ecole Normale," 1800; and finally in the well-known work "Géométrie Descriptive (fourth edition, 1820), which, in simplicity, style and choice of details in a subject which might easily have been overloaded with them, stands second to no elementary work whatever. The methods of descriptive geometry recalled the attention of geometers to the properties of projections in general, of which such only had been particularly noticed as could be applied in the arts of design or in the investigation of

primary properties of the conic sections. From the time of Monge to the present this subject has been cultivated with a vigour which has produced most remarkable results, and promises more. Pure geometry has made no advance since the time of the Greeks, which gives greater help to its means of invention than that which the labours of the school of Monge have effected.

Centring for Groins.

It is obvious that in forming the ribs for each vault the outer curve must be the arc of a circle or ellipsis within the curve of the vault, and distanced from it towards the axis equal to the thickness of the boarding. In making the groined centre, it will be necessary to find the place of the angles on the boarding of the large vault, in order to ascertain the place of the ribs and boarding of the transverse vault. This may be done by three different methods. First, let two straight edges be placed vertically at the angles, and a third straight edge, or an extended line, be made to touch the surface of the boarding, and marked at all the points of contact, keeping the latter straight edge or line always upon the edges of the two vertical straight edges. The defect of this method is, that the place of the angles at the bottom can never be found, since it would require the cross straight edge or line to be of infinite length, and the vertical ones of infinite height. A more eligible method, therefore, where there is room, is, secondly, to fix two ribs in the transverse part, and direct a level straight edge upon their edges, so that the end may come in contact with the boards, and mark the boarding in this place; find a sufficient number of points for the purpose, in the same manner, and draw curves through the points, which will give the curves for fixing the end of the filling-in ribs, otherwise called jack-ribs. In constructing groins to be finished with plaster the angle-ribs must be first fixed, then straight longitudinal pieces parallel to the axis of the groin fixed, either flush with the under side of the angle-ribs, or their under sides a little below those of the angle-ribs, so as to admit of their being nailed together; this is the most eligible method of constructing plaster groins.

The Chinese as Colourists.

With respect to colour the instinctive art of the Chinese is instructive and admirable. They are colourists of remarkable skill, though in this surpassed, as in some other points of art, by the Japanese, also a Mongolian race. Colour as used by these nations is unlike anything else in the world. We hear it called Oriental—that broad and convenient word—but it is not the Orientalism of India, even of Burma, not of Persia, Arabia, or of Turkey, as we now see it. The chief characteristic of Chinese colour is its dependence on the secondaries and tertiaries, and in the use of some of these as pale green, pink and a broken blue, they are unsurpassed by any ornamentalists. They understand the application of the most vivid red, yellow and the brightest white, but in very small quantities in proportion to the broken colours, which give the peculiar character to their work; their skill is so great that by the magic of colour they succeed in harmonising the discordant elements of form which intrude into their compositions and conceal errors or failures that would otherwise be fatal. In considerable surfaces of one tone their management of colour is admirable. The senseless uniformity of hue which mars the effect of many a piece of Sèvres is skilfully avoided by the Chinese potter; his colour on a vase deepens and ripens in parts as the sunny side of an apple or cherry, and it palpitates as do the hues of nature. This true source of effect is at length known to and sought to be realised by some of our potters and by the French. It does not seem to have reached Dresden, and those who are acquainted with the cold opacity of tone which marks so much German porcelain, will agree that the sooner this law of colour is understood among Saxon potters the better for Dresden.

Muriatic Gas as a Disinfectant.

About 1773, Guyton de Morveau, the French chemist, achieved the important discovery of the means of destroying infection by acid vapours, and of all his labours it is this for which his name will be transmitted to posterity with those of the benefactors of mankind. In one of the churches of Dijon a practice had prevailed of burying the dead in considerable numbers within its walls; this proceeding occasioned an infectious exhalation which brought on a malignant disorder, to the great alarm of the inhabitants of the city. When other attempts to remedy this evil had failed, it occurred to Morveau that the vapours of muriatic acid might be successfully employed to remove it. With this view he made a mixture of sulphuric acid and common salt in wide-mouthed vessels, which were placed upon chafing-dishes and in different parts of the edifice; after closing the windows and doors for twenty-four hours and then suffering the air freely to pervade the building, no remains of the fetid smell were perceptible, and the church was cleared from infection. The same process was tried on other occasions, and the practice was afterwards continued

with the improvement of substituting chlorine gas for muriatic or hydrochloric acid gas. Although this was probably the first employment of muriatic acid gas as a disinfectant on a large scale and with results so striking as those detailed, it appears nevertheless that Dr. Johnstone of Worcester had recommended the use of the same gas for this purpose in the year 1756; it is even stated that he employed it in the prison of Worcester, but no evidence exists of his having published an account of his process before the appearance of Morveau's tract on the subject.

Mediæval Treatment of History.

In the painter's treatment of his subject he has to consider the local scenery of the action, the costume and the national character of the actors, and to determine not merely what these were, but how best he may make them tell on the feelings of his spectators. This would appear very easy of solution, but it is not really so. The mosaic of the battle of Arbela, found in Pompeii, shows that local scenery was at least considered, and that the costume and individual characteristics both of Greeks and Persians were carefully attended to in that work, and our offhand decision would be that in all cases these should be strictly adhered to. It must, however, be recollected that the original from which this work was taken was most probably executed at or near the time of the occurrence, or at least while the peoples and nationalities represented were in actual existence, and when it would have been perhaps as great an outrage on the common sense of the spectator to do otherwise than treat them literally as it would be for an artist of our own day to paint the taking of Magdala and represent the English general and his forces either naked or in a classic costume. Yet even this treatment, when set aside by Benjamin West in his picture of *The Death of Wolfe* in favour of a more literal one, was considered a great error in judgment on his part—an error which only his success justified. Then the question is widely different when the incident or action took place in times long past, and when the ideas of the general public, to whom the painter has to appeal, are either quite unsettled or, it may be, wholly at variance with the literal truth. Thus, when art revived in Italy in the Middle Ages and was patronised by the Church in the interests of religion, the knowledge of the East and of its people was very limited, and the painters treated Scripture subjects with the costume and accessories of their own time. This is seen on the fresco in the Campo Santa of *The History of Joseph*; it is not the sandy plains of the delta of the Nile, nor the massive palaces of Egypt that compose the background, but the lighter architecture and hilly scenery by which the painter was surrounded; while the tabard coats, the tight hose and the quaint caps of the fifteenth century are the costume of the children of Jacob. The same, with slight variations, are to be seen in *The Life of Moses* and *The Passage of the Red Sea*. Even where in these compositions the dresses are not literal, they certainly have no relation to historical fact. This may have had the effect of bringing such subjects more home to the feelings of the ignorant; there was no attempt to carry them back to a remote age with which they were unacquainted; they saw, as it were, their own people, the great men of their own time (for many of the spectators are no doubt portraits) forming a part of the history and as witnesses of its truth. Whether or not this feeling was really aroused it is difficult to say, but certainly the Mediæval artists most frequently treated the facts of Scripture history wholly different from the manner in which they must have occurred, and in accordance with the habits of their own age and time.

Pompeian Mosaics.

The mosaics at Pompeii are of two sorts; the first has a groundwork of stucco, with a pattern formed of little squares of white marble or sometimes of black, or of both fixed into it. The footway of the streets is generally done in this manner; the white squares are placed diagonally in continued lines at a considerable distance apart, and more appearance of design is produced from this simple arrangement than you could easily conceive; in the houses, where it is executed with more care, the effect is very good, but that composed of black squares is decidedly inferior to that where white alone are employed. The more finished mosaics are composed entirely of small squares, or tesserae, generally black and white, but sometimes also of various colours; the patterns are very fanciful, some of them very good, but among the good there is nothing which has not long been in use in modern times for one sort of ornament or another. These mosaics do not seem very ancient in Pompeii, for wherever one finds them in use among the ancient architecture, they uniformly bury a portion of the lower part of it.

The British Association will meet next year in Ipswich under the presidency of Sir Douglas Galton. For the meeting of 1896 Liverpool has been selected, and it is likely that in 1897 there will be a meeting in Toronto.

NOTES AND COMMENTS.

THE first part of a new work on "The Churches of Shropshire" has been published by Messrs. HOBSON, of Wellington. The descriptions are by Mr. H. S. CRANAGE, M.A., who has obtained the aid of Mr. M. T. HARDING for the photographs and Mr. W. ARTHUR WEBB for the ground plans. The work is to consist of ten parts, and it is intended to be "a history of the actual fabrics of the churches and not in any sense a history of the parishes of the county or of the chief families who have inhabited them." It has been written after careful study of the architecture on the spot. The first part treats of the Hundred of Brimstree. The churches illustrated by photographs are Claverley, Shiffnal, Tong (supposed to be the church where Little NELL of the "Old Curiosity Shop" found her last refuge) and Worfield. Some other churches are described, including St. Mary's, Bridgnorth, a Classic building of which TELFORD, the engineer, was the architect. Mr. CRANAGE has been very careful in his accounts of the buildings, and the order of the description being uniform, reference becomes easy. He is not afraid to condemn the weakness of some modern buildings. The collotype illustrations are beautiful and have a softness that is in keeping with the old masonry. Mr. WEBB's plans are hatched in such a way as to suggest the parts belonging to different periods. Altogether the "Architectural Account" promises to be a most valuable record, and it is likely to incite the production of similar books in other counties. It would be an advantage if Mr. CRANAGE could persuade the clergy to remove the banners, altar decorations, &c., while the churches are photographed. They do not enhance the charm of the architecture, although they may be prized by some simple rustics.

It cannot be said there is any monotony about the "Portfolio Monographs." For the sixth of the series we have "Frederick Walker" by Mr. CLAUDE PHILLIPS, and then comes "Fair Women" by Mr. WILLIAM SHARP. Like their predecessors they are themes which are well adapted for treatment by pen and pencil. WALKER is the LYCIDAS of modern English painting, and pity for his fate balances the admiration for his works. He may have attained as much maturity as became his talent, but it is no less reasonable to suppose that all the works he produced were only preliminary exercises by the aid of which he was attaining power. He was a great experimentalist, yet he could hardly be said to have attained a style. There are drawings by WALKER which if considered apart from the colour may be said to have the fidelity of photographs, while in others there are peasants so idealised they recall Greek heroes. It would also seem from some of his later works as if he thought he was a landscapist rather than a figure-painter. He was susceptible to every sort of influence that could be expressed by art, and it would be hard to say whether any of them would ever exercise supreme control over him. The "Portfolio Monograph" contains many illustrations of his works, and there is not one among them which is not interesting. The plate of *Philip in Church* by itself is worth more than the price of the monograph. Mr. CLAUDE PHILLIPS does not write as an advocate or an apologist, for he is candid in expressing his opinion of WALKER's shortcomings. In "Fair Women," Mr. SHARP is able to indulge in an imaginative sort of treatment of the subject and performs a difficult feat with skill. The illustrations extend from Greco-Roman portraiture to that of our own time, and it is needless to say they justify the title given to the monograph.

ARCHITECTURE is receiving much attention in the Edinburgh Museum of Science and Art. The refreshment-room, which received little patronage, has been utilised for the display of casts. The museum had acquired a large number which had been originally made under the direction of Sir CHARLES BARRY for the use of the stone and wood-carvers employed in the building of the present Houses of Parliament. Many of them had been taken from work in the Lincolnshire and Norfolk churches. But they could not be described and labelled, as the identification was

neglected. That onerous work is now complete, thanks to the curator. Photographs were obtained of the casts, then Norfolk and Lincoln were explored until the original subjects were discovered. Parts of the buildings showing the subjects were also photographed, and the value of the casts is consequently enhanced, for their relation to the surrounding work can be ascertained. The museum has also obtained casts of the Tuam cross, parts of the transept doorways of the cathedrals of Bordeaux and Beauvais, and part of the rood-loft in Limoges Cathedral.

ACCORDING to Sir A. GEIKIE, the Director-General, the original Ordnance 1-inch maps of the centre and south of England, on which the work of the Geological Survey has been engraved and published, were in many cases engraved from inaccurate surveys, and their topography has become, over large parts of the country, so antiquated as to be of little use. They are now entirely superseded by the new series of 1-inch Ordnance maps. The re-surveys for drift and for coal-field purposes now being made by the Geological Survey are conducted upon the latest 6-inch Ordnance sheets. It is found difficult, sometimes indeed impossible, to make a satisfactory reduction of the geological work from these field-maps to the old, inaccurate and antiquated 1-inch maps of the Survey. The expense of alteration of the old plates would be so serious, sometimes involving the entire cancelling of a plate and the preparation of a new one, that on the ground alike of efficiency and of cost it will be desirable and indeed necessary, as the re-survey advances, to cancel the old series and to adopt the new, as has been done by the Ordnance Survey.

THE report of the select committee of the House of Commons on the Patent Agents Bill has been issued. The committee concur in the opinion formerly expressed by the committee of 1865 and 1866. The committee consider that while it is desirable that there should be a roll of duly qualified agents practising at the Patent Office, there should be no regulation which should prevent solicitors or other professional men from doing the same, or compel the inventor to employ any particular class of agent, or any agent at all. The committee believe that it would be most undesirable to put the exclusive right of communicating with the Patent Office in the hands of any body of men, or to create a monopoly for their advantage. At the same time the committee are of opinion that it would be of public advantage to give to persons practising as patent agents an improved professional standing and organisation, and to establish disciplinary control with reference to them. The committee also think that it would be desirable to a certain extent to associate with patent agents persons who, as trade-mark agents, transact business at the Patent Office, and have patent agency work frequently entrusted to them. Finally, the committee hope that the Bill reported by them as amended will give all reasonable facilities for such persons to become registered patent agents.

ON Wednesday there was a meeting of the Huddersfield Town Council to consider the subject of the proposed hospital for infectious diseases at Mill Hill. The designs sent in had been examined by Mr. A. GRAHAM, architect, and Dr. WHITELEGGE, who had awarded the premiums to the following competitors:—First, "Aspect," Messrs. ED. THOMAS & SONS, Queen Anne's Gate, London; second, "Microbe," Messrs. GROLL, MINTY & WEBBE, Hampstead Road, London; and third, "Efficiency and Economy," Messrs. R. THORNTON, SHIELLS & THOMPSON, and "Hygeia," Mr. J. W. DONALD, South Shields (bracketed). The chairman of the health committee stated that they would not undertake the erection of the buildings until a necessity arose. The town clerk said that by the conditions they were not obliged to commence operations at once, but whenever they did so they were bound to give the work to the authors of the first design and to pay them a commission of 5 per cent. One of the aldermen said he considered the first design was not the best adapted for the site. A decision was not given.



"WHEATFIELD LODGE," HEAD PARLOR.
T. BUTLER WILSON

17th 1894.

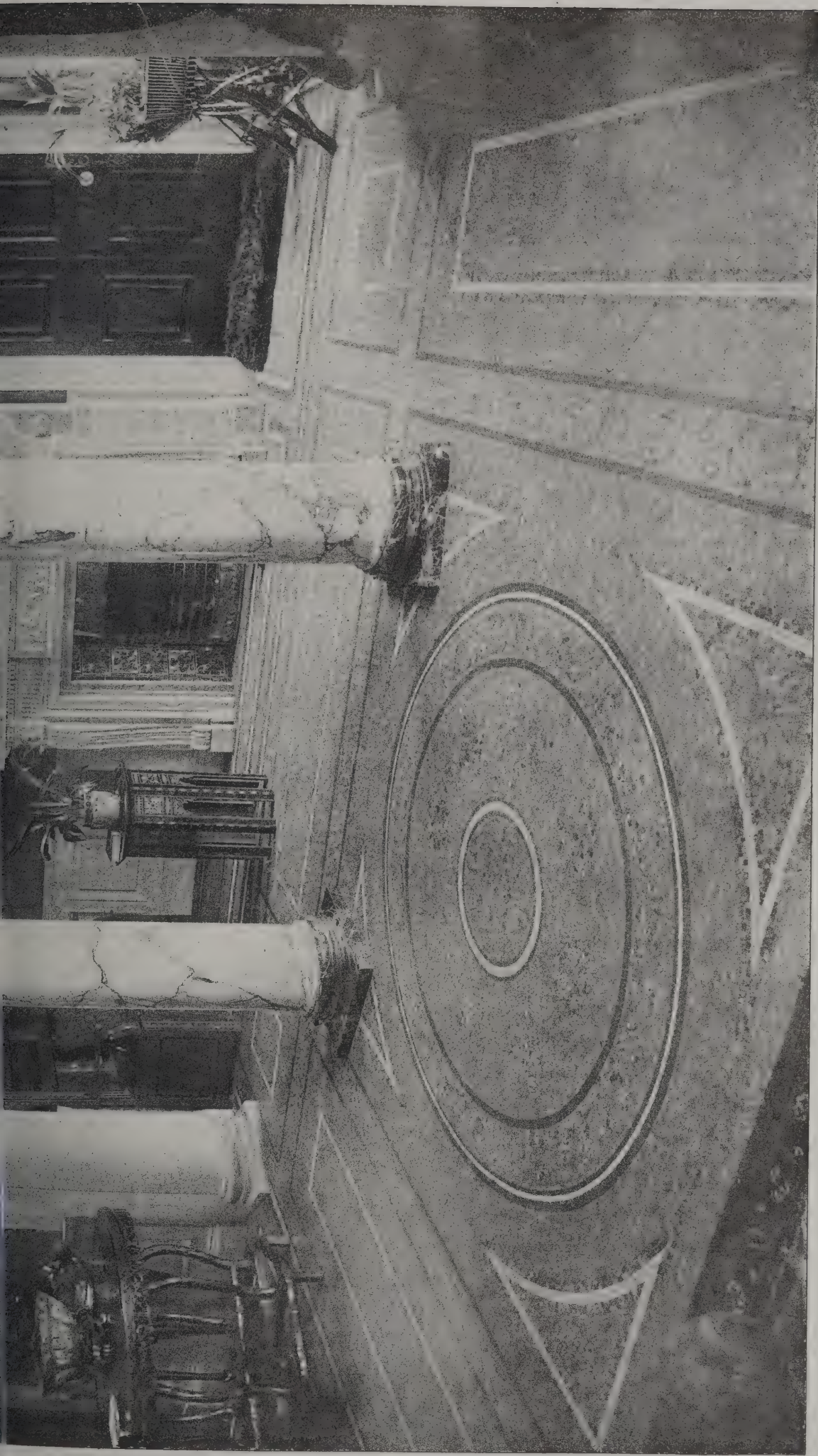


WORKS: THE BILLIARD ROOM.
E., Architect.

INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

The Architect, Aug 17th 1894.





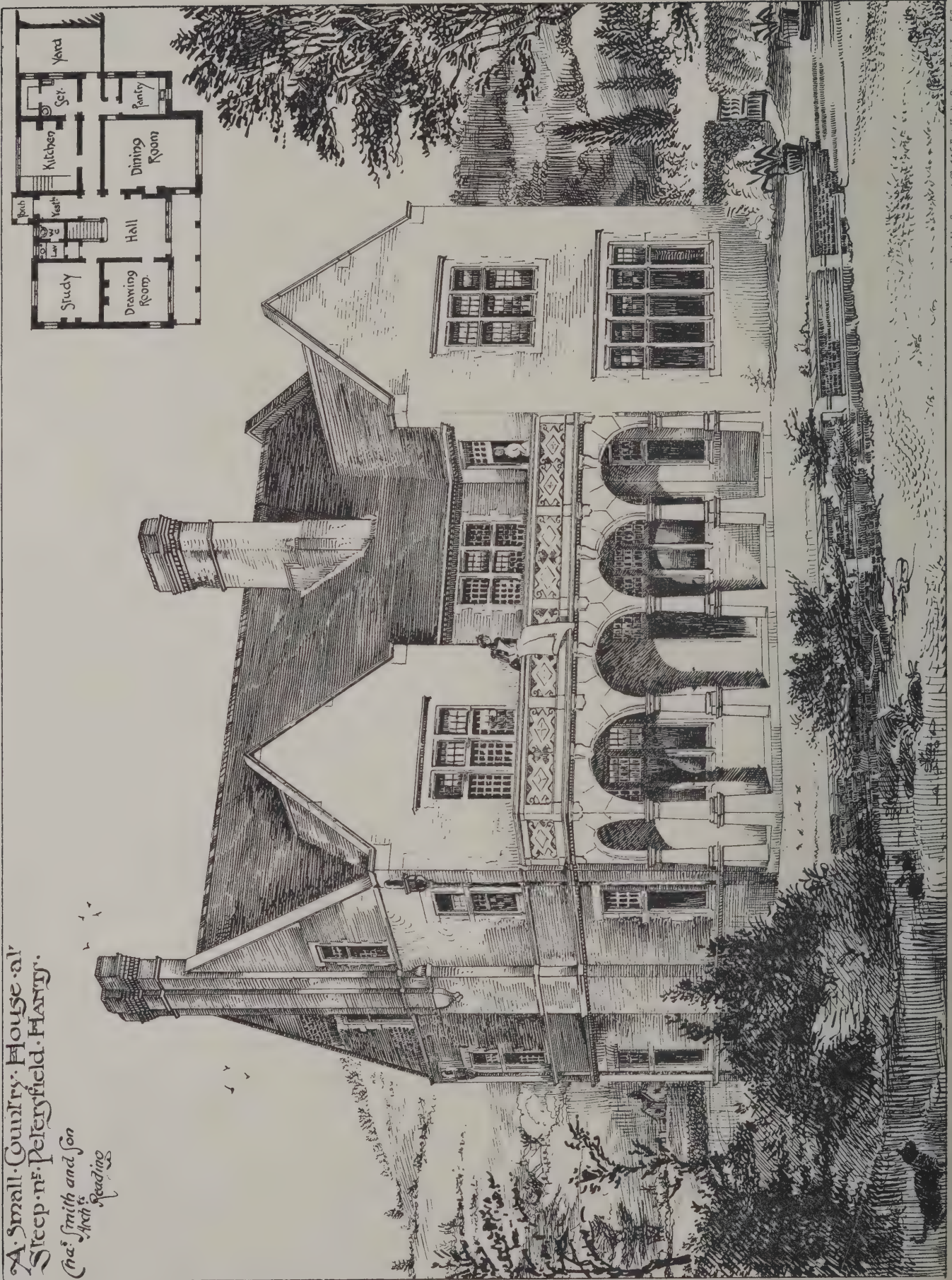
INK PHOTO. SPRAGUE & CO. 4 & 5, EAST HARING STREET, FETTER LANE, E.C.

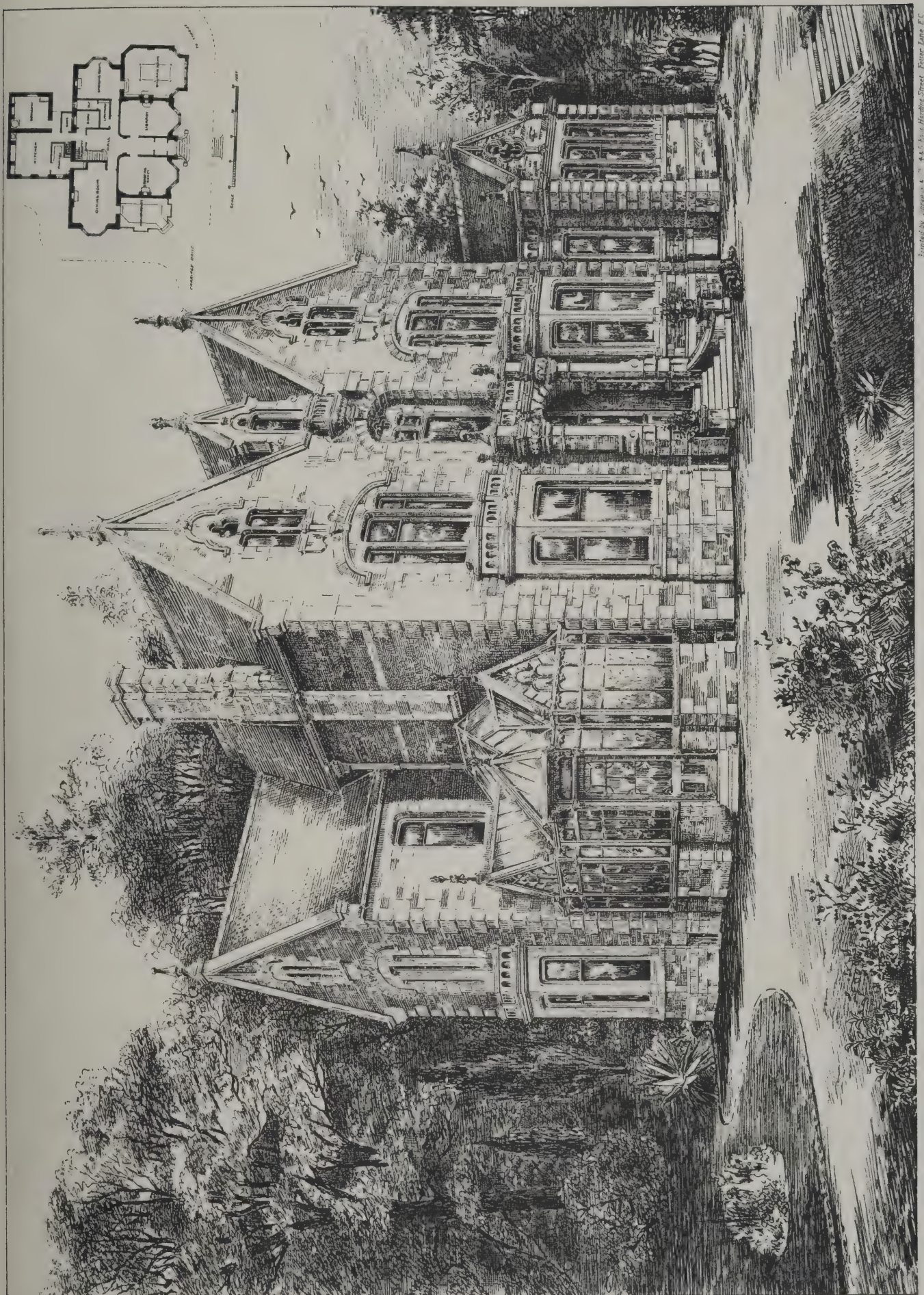
"WHEATFIELD LODGE," HEADINGLEY, YORKS: THE HALL.

T. BUTLER WILSON, F.R.I.B.A., Architect.

A Small Country House at
Steep near Petersfield, Hants.

Chas. Smith and Son
Arch^s Reading





"MALABAR," TRURO.
SAMPSON HILL, Architect.

Engraved by J. P. Morgan & Co. 48, 50, 52, Hunting Street, Finsbury Lane E.C.

ILLUSTRATIONS.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE HALL.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE BILLIARD-ROOM.

A SMALL COUNTRY HOUSE AT STEEP, NEAR PETERSFIELD.

THIS house, a perspective sketch of which forms one of our illustrations this week, is now in course of erection at Steep. The site is on the southern slope of the downs, and commands most extensive views towards the coast, which can be fully enjoyed from the balcony and verandah.

The plan has been specially arranged with a view to possible future extension. The work is being carried out by Messrs. GAMMON & SON, builders, of Petersfield; from the designs and under the superintendence of Messrs. CHAS. SMITH & SON, architects, Reading.

MALABAR, TRURO.

THIS residence, approaching completion, has been erected near Truro for Mr. W. CHIVELL. It stands in its own grounds of about 25 acres, and takes the place of an old building. The elevation is somewhat lofty, taking advantage of the fine views which the site commands.

The walls are faced with a green-tinted freestone from Bodmin quarries, the dressings being of granite from Messrs. FREEMAN'S works at Mabe, and the pilasters to entrance porch of polished Aberdeen.

The joinery of the principal rooms on ground floor is of teak wood, and some very effective carving is introduced in the dining-room, hall and doors. The ceilings of dining and billiard-rooms are panelled and enriched in plaster, both rooms having a moulded teak-wood dado. The dining-room has an oak parquet floor, and the floor of billiard-room is laid with solid wood blocks.

The house throughout is extensively fitted with all modern appliances, and well lighted in every part.

The whole of the internal fittings have been specially designed by the architect, Mr. SAMPSON HILL, of Redruth, and the work has been faithfully carried out by Mr. M. CLEMENS, of Truro, through his own staff.

SUSSEX ARCHÆOLOGICAL SOCIETY.

THE annual meeting of the Sussex Archæological Society was held in Horsham on the 9th inst. The remains of antiquity in the town were visited under the guidance of Mr. A. Garraway Rice, F.S.A. Among the buildings pointed out were the half-timbered building known as North Chapel, and Horsham Park House. The Carfax, an open space on which fairs were held, was described. It still retains the ring to which bulls were tied for the barbarous sport of baiting, which was practised in Horsham until 1811. It was pointed out that a band-stand with its surrounding flower-beds might be considered as marking the space formerly known as the Gaol Green, which was in front of the old gaol. That building was superseded in 1775 by a prison in East Street, and had the unenviable reputation of being the last place in England where the sentence of pressing to death was carried out on prisoners who declined to plead. The cellars of some houses in Richmond Terrace are believed to have formed parts of the gaol. The old Horsham houses, judging by the few that have survived near the Green, were not remarkable for height. A house on the Causeway is supposed to have been erected in the time of Henry VIII., but the front has been modernised. The Manor House dates from 1704. If Horsham cannot display surprising examples of Domestic architecture, there is enough remaining to suggest a respectable county town.

The parish church was, however, the principal attraction for the visitors. In the parish room was exhibited a collection of antiquities, mainly from Sussex, including firebricks and other examples of local iron manufacture, rubbings of brasses, chests, &c. On such occasions nothing seems more interesting than relics, and as some bones in one of the cases were described as the remains of the wife of Richard I. the show became a success. Horsham Church was described by Mr. L. Lewis André, who of late years has rendered efficient service at the meetings. The vicar prepared a paper on his predecessors in office. Among the later clergymen who had charge of Horsham was Hugh James Rose, who was said to be the best preacher in England, but for the purpose of increasing the accommodation in the church to enable people to hear him old

work was sacrificed, the chancel screen being one of the victims. John Fisher Hodgson, who was vicar from 1840 until 1884, was zealous for improvements. His first important act as vicar was to rebuild the Parsonage House upon a better site, and to surround it with the lawn and gardens which give it a peculiar charm, but his great work was the rescue of the parish church from decay and in some points from absolute ruin. Opinions may differ as to the taste and judgment displayed in this "restoration" by the architect, but this should not in any way detract from the gratitude due to the vicar for the zeal and munificence which he displayed in the achievement of a great and costly undertaking.

After luncheon the annual meeting was held. The hon. secretary, Mr. H. Griffith, expressed a desire to have a representative of the Society in every parish of the county, in order that all discoveries might be at once notified to the committee.

Mr. Davis said he should be glad to obtain subscriptions towards the amount required, about 700*l.*, for the preservation of the castle, gateway and church at Rye. It was decided to submit the subject to the committee for consideration.

A journey was next undertaken to Shipley Church, which was described by the Rev. E. S. Arkle. He said the date of the building of the church was unknown, but that one existed in the twelfth century is evident from a grant to the Knights Templars. The church was subjected to restorations in the latter part of the seventeenth century, and in 1832, when much injury was inflicted. In consequence, the remains of antiquity were few. The recent restoration at the expense of Sir Robert Loder enabled examples of the old painting and carving to be revealed.

At Knepp Castle the members were received by Sir Raymond Burrell. Afterwards West Grinstead Church was visited, and it was described by the Rev. Knatchbull-Hugessen. It contains many objects which are interesting, and the visit was a satisfactory ending for a day which afforded much enjoyment to all who were able to take part in the proceedings.

THE GLASTONBURY PREHISTORIC VILLAGE.

A REPORT on the Lake Village at Glastonbury was presented to the British Association on Monday from the committee, consisting of Dr. R. Munro, chairman, Mr. A. Bulleid, secretary, Professor W. Boyd Dawkins, General Pitt-Rivers and Sir John Evans. The work at the British Lake Village, near Glastonbury, has been much retarded by the flood-water that accumulated during the winter and by the heavy rains during the spring. The following facts have been established:—(a) That the village was originally surrounded by the water of a shallow mere; (b) that 5 feet of peat accumulated during its occupation; (c) that a strong palisading of posts and piles protected the village; (d) that the groundwork of the village, so far at least as its margin is concerned, is artificial for the depth of 5 feet. Numerous and important objects have been unearthed this season from the peat outside the village at all depths down to 7 feet 3 inches, and as far as 80 feet from the village border. Pottery—hand and wheel made—clay pellets (so-called sling-stones), baked and unbaked, and bones of animals are still met with at all points in great quantities. Recently a decorated wheel-made bowl of black ware has been found in perfect preservation and highly finished, 4 inches high and 5 inches across the rim, besides numerous other pieces of pottery elaborately marked with designs of circles, curved and flowing lines, and triangles. The find of greatest importance in bronze has been a well-preserved bowl measuring 4½ inches across the rim. Among the other objects of bronze are two more spiral finger-rings and a penannular ring brooch. In iron there is a reaping-hook, together with its wooden handle 16 inches in length, and a primitive sickle, with rivetted wood handle complete, in length 10 inches. More human remains have been met with this year than previously, including a complete skull showing several sword or axe marks; no other bones belonging to the body were discovered near it. There still remain two-thirds of the village border to be traced, and nearly fifty dwelling-mounds and about five-sixths of the entire village area to be examined. All the objects that it has been possible to move to the Glastonbury Museum have already been placed and arranged there in the cases.

The Examiners of the London water-supply say that the conviction has been forced upon them that the samples of water collected and presumed to be respectively from the New River and Chelsea mains, were, through some systematic error, really the same water. It has been discovered that the samples, which were drawn from standpipes supposed to be supplied by the different companies, were really both supplied by the New River company.

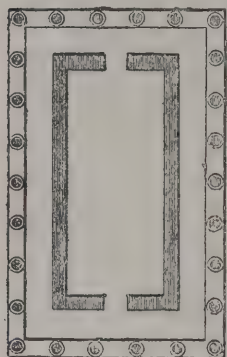
THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Continued from page 93.)

I WILL now give the following distinct reasons why the architecture of the Greek temples cannot be introduced or imitated with propriety by Christians.

1. These temples were erected for an idolatrous worship, and were suited only for the idolatrous rites which were performed in them. The interior, entered only by the priests, was comparatively small, and either dark or open at the top, while the peristyle and porticoes were spacious, for the people who assisted without. There is not the slightest similarity between our worship and the idolatrous worship of the Greeks. We require that the people should be within the church, not outside. If, therefore, you adopt a perfect Greek temple, your interior will be confined and ill-suited for the intended purpose, while your exterior will occasion an enormous outlay without any utility.



If, on the other hand, you strip a Greek temple of its external peristyle, and build your external walls in the place of the pillars, you entirely destroy the most beautiful feature of the architecture, and the building becomes a miserable departure from the style it professes to imitate.

4. Our northern climate requires an acute pitch of roof to prevent the accumulation of snow and to resist weather.* The Greeks, whose climate is the reverse of ours, had their roofs and pediments exceedingly flat, nor could they be raised to our proper pitch without violating the character of their architecture.



Elevated Greek Roof.

In short, Greek temples are utterly inapplicable to the purpose of Christian churches,† and the attempt is little short of madness when our country is literally covered with beautiful models of ecclesiastical structures of every dimension, the architecture and arrangement of which have originated in their wants and purpose. An old English parish church, as originally used for the ancient worship, was one of the most beautiful and appropriate buildings that the mind of man could conceive; every portion of it answered both a useful and mystical purpose. There stood the tower, not formed of detached and misapplied portions of architectural detail stuck over one another to make up a height, but solid buttresses and walls rising from a massive base, and gradually diminishing and enriching as they rise, till they were terminated in a heaven-pointing spire surrounded by clusters of pinnacles, and forming a beautiful and instructive emblem of a Christian's brightest hopes. These towers served



Old English Parish Church.

2. The Greeks did not introduce windows in their temples; they are essentially necessary with us. Perforate the walls with windows, and you again destroy the simplicity and unity of Greek architecture, which its admirers extol as one of its greatest beauties.

3. Christian churches require bells, by the sound of which the faithful may be called to their devotions. The bells, to be distinctly heard, must be suspended in a tower or belfry, and these are features utterly unknown in Greek architecture. A tower composed of a number of small porticoes set over one another, and placed in front of a mock temple, is a most glaring absurdity, nor is a tower of this description, starting out of nothing at the top of a portico, any better (for illustrations, see page 92).

a double purpose, for in them hung the solemn-sounding bells to summon the people to the offices of the Church, and by their lofty elevation they served as beacons to direct their footsteps

* It is to be remarked that flat-pitched roofs were not introduced into English Pointed churches till after the decline of that style, and the marks of the old high gabled roofs are generally to be seen in the towers of those churches where the present roofs are flat, proving them to have been altered subsequent to the original erection of the buildings.

† Neither are they better adapted for domestic purposes, for it is still more absurd to see two or three tiers of windows introduced in the shell of a Greek temple, the roof of which is broken by numerous stacks of vainly disguised chimneys. Yet notwithstanding the palpable

to the sacred spot. Then the southern porch, destined for the performance of many rites; the spacious nave and aisles for the faithful; the oaken canopy carved with images of the heavenly host, and painted with quaint and appropriate devices; the impressive doom or judgment pictured over the great chancel arch; the fretted screen and rood-loft; the mystical separation between the sacrifice and the people, with the emblem of redemption carried on high and surrounded with glory; the great altar, rich in hangings, placed far from irreverent gaze, and with the brilliant eastern window terminating this long perspective, while the chantry and guild chapels, pious foundations of families and confraternities, contributed greatly to increase the solemnity of the glorious pile. Such is but a faint outline of the national edifices which have been abandoned for pewed and galleried assembly-rooms, decorated only with gas-fittings and stoves, and without so much as one holy or soul-stirring emblem about them.

We will now examine architectural propriety with reference to collegiate architecture. Our old English Catholic colleges will illustrate most beautifully the principle I wish to demonstrate. The main feature of these buildings was the chapel; to our Catholic forefathers the celebration of the divine office with becoming solemnity and splendour formed a primary consideration, and ample was the provision made for this pur-

considered a defect by ignorant modern artists, but will be found on examination, like all other practices of the ancient architects, to be based on excellent practical reasons.

The advantages of this arrangement are as follows. 1. All the internal space usually occupied by chimney stacks, and which is very considerable, is gained to the apartments. 2. The stacks of chimneys thus placed act as buttresses to the wall. 3. The danger of fire consequent upon chimney flues passing through the woodwork of the roofs is entirely avoided. 4. A great variety of light and shadow and a succession of bold features are gained in the building (see next page). It is impossible to conceive any buildings better adapted for collegiate purposes, either as regards arrangement or design, than the two establishments founded by that great and good man, William of Wykeham, at Winchester and Oxford. He had two classes to consider in his foundation at Winchester, the clergy and the students. For the former he provided beautiful cloisters retired from the rest of the edifice, suited for contemplation and devotion; while for the latter he assigned ample space for healthy recreation in bad weather and level meadows for summer sports. The whole character of these buildings is at once severe, elegant and scholastic; it is precisely what it should be, as the will of Henry VI. specifies of the domestic portion of his college at Cambridge, that it should



pose in all the old collegiate foundations. The place set apart for this holy purpose generally towered over the surrounding buildings. The chapels of King's College and Eton can be distinctly seen many miles before the subordinate buildings can be discerned. Oxford, at a distance, presents a complete grove of towers, spires and pinnacled turrets rising from the collegiate churches. After this principal feature, every portion of these edifices had its distinguishing character and elevation; in order to give due effect to the gate-house, refectory and other important parts of the building, the chambers never exceeded the height of one storey above the ground floor.* A very characteristic feature of the old collegiate buildings is the position of the chimneys, which are made to project from the front walls of the buildings. This, I am well aware, has been

impracticability of adapting the Greek temples to our climate, habits and religion, we see the attempt and failure continually made and repeated: post-office, theatre, church, bath, reading-room, hotel, Methodist chapel, and turnpike-gate—all present the eternal sameness of a Grecian temple outraged in all its proportions and character (see woodcut, page 108).

* In those ancient colleges where these chambers have been raised in modern times, the effect of the original design has been completely ruined; and the new collegiate buildings at St. John's, Cambridge, from their height have all the appearance of a Gothic warehouse or factory. This is another instance of the folly of using Pointed details without following the spirit of the ancient buildings.

be built without too great superfluity of detail or "busie" moulding; * and on this principle Wykeham designed his building. The external ornaments are few, but admirably selected; an image of our blessed Ladye with our Lord is placed over each gateway, in reference to the college being dedicated to God, under the invocation of His blessed mother, towards whom the good bishop entertained an extraordinary devotion, even from his tender years. The other images on either side of the centre niche are those of the angel Gabriel, and Wykeham himself in a kneeling position.

The interior of the chapel (now wofully disfigured), as left by the founder must have been glorious in the extreme; it consisted of a choir and ante-chapel, by the side of which rose the bell-tower, simple, but elegant and lofty.

The members of the society were buried in the cloisters,

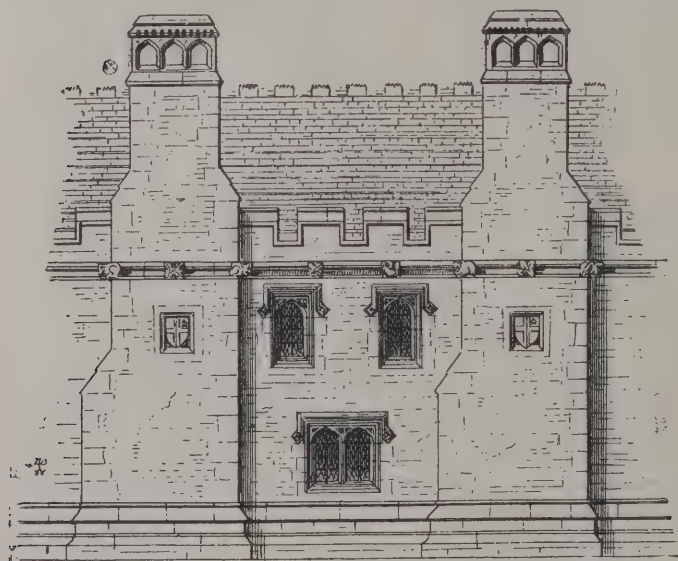
* Notwithstanding the directions contained in this will, where the founder's intentions regarding his collegiate buildings are fully and distinctly expressed, the architect (when the glorious opportunity offered a few years since of fulfilling them to the letter, and erecting a truly fine building) was allowed to depart entirely from them, and raise a florid structure, arranged in direct opposition to all old collegiate traditions, and the very decorations of which were misapplied details taken from the original chapel, which had been elaborately enriched by the ancient builders for the purpose of distinguishing its sacred destination from the surrounding erections.

and also in the ante-chapel, as their memorials of beautifully-engraved brass testify. The intention of these was, doubtless, both to incite the surviving community to pray for their souls' repose, and to remind them continually of the similar fate that would inevitably befall them. How Catholic wisdom and Catholic piety stand conspicuous in all the arrangements of



An Adapted Greek Temple.

these noble buildings! How great the master mind who planned and executed them, and yet how few are there in these days able to understand or willing to imitate them. Can we conceive a more atrocious scheme to destroy the solemn grandeur of Wykeham's church than to allow such a man as Sir Joshua Reynolds to design a transparency for the western end, and appoint James Wyatt the destructive to overturn the ancient features and arrangements, setting up the subsellæ of the stalls



Arrangement of College Chimneys.

as brackets for book-desks, and covering the walls with meagre decorations and Bernasconi Gothic?



A Modern College.

Modern collegiate buildings,* especially on the Continent, are the reverse of all that I have been describing. In them we

* It is impossible to conceive a more uncollegiate-looking building than what is called the London University, with its useless dome and portico. It may, however, be urged in its defence that any thing ecclesiastical or Christian would be very inappropriate, and that the pagan exterior is much more in character with the intentions and principles of the institution.

look in vain for the solemn quadrangle, the studious cloister, the turreted gate-house, the noble refectory with its oak-beamed roof, the mullioned windows and pinnacled parapet and lofty tower of the church; not a ghost of these venerable characteristics of a college is to be seen, but generally one uniform mass, unbroken either in outline or in face, undistinguishable from other large buildings which surround it. As to its purpose, it might be taken for a barrack hospital or asylum. How is it possible to expect that the race of men who proceed from these factories of learning will possess the same feelings as those who anciently went forth from the Catholic structures of Oxford and Winchester? We cannot sufficiently admire our English universities; there is nothing like them existing on the Continent, notwithstanding the miserable conditions and modernisations which have so greatly disfigured the ancient buildings. There is more Catholic scholastic architecture to be found united at Oxford than in any place I have ever visited. Let us hope and pray that its glories may not exist in vain, but that learned and thinking men may be led to draw a parallel in their minds between the faith of those good souls who founded these noble institutions and our present degraded and half-infidel condition, by which consideration they may be led back to Catholic unity and faith, in which great works can be alone accomplished or blessings derived from them.

(To be continued.)

TECHNICAL EDUCATION.*

NEWBURY, as all the world knows, was anciently renowned for its manufacture of cloth, and though I speak with some hesitation in the presence of those knowing better than myself, I believe three of its most interesting architectural monuments attest the wealth and importance of its townsmen formerly engaged in that industry. I allude to the tower of the parish church, built by John Winchcombe, your far-famed "Jack"; to Shaw House, erected by his rival in trade, Thomas Dolman, and to the ancient Cloth Hall, a relic of the past importance of that trade, much rarer in England than in the Low Countries. It therefore seems to be peculiarly fitting that a commodious building of architectural character, and well adapted for technical instruction, should be established in this ancient seat of prosperous trade. A building which, under the fostering care of your Corporation, may help to stimulate if not a revival of the particular industry which gave in Tudor times such importance to your town, at any rate industrial activity in some other direction. If coal must be used in such new departure, you have in your townsmen's (Mr. Elliott's) invention a means of washing your smoke, and so preserving the pure and invigorating qualities of Newbury air. And perhaps in time, by your studies and your ingenuity, you may see your way to utilise the very force of the air as its rushes past for the production of some motive power which will dispense altogether with the use of coal in manufacture. This would indeed be an achievement worthy of Newbury's reputation.

The pupils in your school of art, now to be located in your new premises, are showing the results of Mr. Coles's excellent teaching in very good work. In science, as is perhaps natural, there is not as yet so great a thirst for instruction. At first sight science is not to most so attractive as art. Yet there is no gainsaying the great advantages to be derived from a knowledge of practical chemistry, of geometry, mechanics, of building construction, to Berkshire people especially of botany and the principles of agriculture, to many of shorthand and to all of cookery. On this latter subject I am an enthusiast, not that I know anything about its mysteries, however much I should like to. I once began to sit at the feet of a professor of the art at South Kensington, but was laughed at for my pains. Though we ought not to live to eat, yet we must all eat to live, and it is consequently of enormous importance that what we eat should be palatable and digestible. The chemistry, therefore, of our food, and its proper preparation, are not subjects to be despised or considered beneath the notice of cultivated people. I suppose there is no country under heaven where the materials, the raw materials, of good food are so easily procurable and so varied as they are in England, and no country where so little is made of them, where there is so much waste in their preparation. Some ladies are, I understand, now studying the art of cooking as a career in life, and they are to be honoured for it. They will not only become in this way highly useful members of society by their practice of the art, but will be able by their knowledge to lend assistance and impart instruction to their less favoured sisters, the wives and daughters of labouring men, who only too frequently do not know the secret of living both economically and well, do not know how to make the most of the provisions they buy, and so

* An address by Mr. Waterhouse, R.A., delivered at the opening of the Newbury Technical Institute on the 8th inst., and published in the *Newbury Weekly News*.

the hard-earned wages of the bread-winner are in part wasted. We say "bread-winner," and rightly, so long as the chief food of the family is the everlasting bread and tea, the latter very often without any milk to it. Why should it not be for a variety oatmeal-porridge winner, or lentil-soup winner, if the women of the household did but know how to prepare attractively such nourishing and excellent dietary?

We hear much of the danger of foreign competition robbing England of her trade, and consequently of her wealth, and such danger is already at our doors. This danger arises from two causes. First, from foreign labour producing more for less wages, and secondly, from this labour being often directed by more intelligence than ours. It is this latter cause of our deficiency, the lack of the due influence of mind on matter, that these grants for technical education are intended to rectify. It is most earnestly to be hoped that the people of England will avail themselves of the opportunities now perhaps for the first time presented to them, and seek to be guided more and more by intelligence in their work, and not so much as formerly by that dear old "rule of thumb." This is the more important as we do not wish to see our people overworked. Many of the workers in the most well-to-do continental nations labour fourteen, fifteen or sixteen hours a day. This will not do any longer for us Englishmen. We must have our time for recreation and for improving our minds. And quite right too; without something worthy of our interest to occupy our leisure, we may perhaps be better without it. Let us then put all our energies, physical and mental, into our work while we are about it, and have a care that our leisure hours are well spent also. And where, may I ask, sir, could they be better spent in the long dark evenings of autumn and winter, at any rate, than in that temple of technical instruction which you have just raised for the benefit and enjoyment of the people of Newbury?

For the evenings of spring and summer there are perhaps purer joys even than those offered by your excellent institution. I mean in the study and appreciation of nature. To many this may seem a somewhat vain and frivolous pursuit. To mere money-making people it is profitless; even to those whose hearts are set on higher things it may seem so too. But the fact remains that we have been placed in a most beautiful world, and in this immediate neighbourhood is not the least beautiful part of it. Its wonders, its mysteries, invite us all—are open to all. The poorest as well as the most well-to-do of us have offered to them in the beauties of nature an inexhaustible feast, almost intoxicating to the senses, giving joy to the heart, an antidote to the petty worries of existence. Yet how few avail themselves of the good thus provided for them? If we search for the cause it is not far to seek. We have eyes, but they see not; ears, but they hear not. The cause for our blindness, our dulness, our apathy and indifference, is to be found in our ignorance and want of study. We do not train our eyes to observe, and we cannot see what we know and care nothing about. To take a familiar instance or two. Many people would say that in summer all trees are green, whereas they are all grey, inclining to green more or less, with every variety of hue and tone, their upper surfaces bluish when reflecting the sky, their under surfaces reddish when reflecting sunlit earth; their young July shoots are yellowish, or, as in some oaks, rose-colour. The unobservant would not notice the way in which various sorts of trees receive the sunshine or the diffused light of a dull day; the broad masses of it which settle on the elm, the bright points on the oak, the feathery tufts of light which enliven the foliage of the ash. Nor would they notice the peculiarities of tree-growth: some species inclining to a pyramidal form, with central stem and leader, others with forked branches to a more globular shape, or to a flattened head or to pendulous branches. Nor would they notice how special circumstances modify these characteristics of race, how wind persistently blowing from one quarter will incline the tree's growth to leeward; how the shade of other trees will drive it to strange manœuvres in its search for light and sunshine. What pursuit is more fascinating to the observant than the study of reflections in almost still water? Wayward they seem to be, and yet all submitting to inexorable law, from the point where they begin, so well defined, from the opposite bank to where they lose themselves in the submerged sunlit pebbles at our feet.

But, you will say, what has all this to do with the brave new school of technical instruction we are opening to-day? Why would you send us out into the fields, woods and commons, when we have just acquired this new source of interest and enjoyment at our very doors? To the point then without more to do. I notice that by far the larger number of your students hitherto have been those who attend the drawing classes. Drawing is in my opinion the best key whereby to unlock our appreciation of the beauties of nature, and it is here, under the able direction of your art master, that you can be put in possession of this precious "Open sesame." If rightly practised, drawing teaches us to observe with an intelligent eye. It is not merely necessary to acquire dexterity in the use of

pencil and brush. We need work with head and heart as well as with hand, and there is yet another faculty which the art student ought to practise—that of memory. I would commend the habit, after a careful study of any object in the schools or scene out-of-doors, of reproducing it from memory only, and then comparing it with the original study, or better still, with the subject itself. The knowledge beforehand that he is going to put his memory to so severe a test will act as a powerful incentive to the student to keep his mind while at his sketch on the *qui vive*. He will observe the proportions of things, the subtlety of the curves of nature, the harmony and delicacy of her colouring in a way unknown to those to whom this method is unfamiliar. To the architectural student I know this practice to be of the greatest value, a short cut, if such a thing there be in art, to available knowledge and self-reliance.

So then let us learn to draw from motives apart from the hope of becoming professional artists. From their own standpoint the world is already too full of them, and possibly from the very prodigality of their output is more chary than it used to be of becoming possessed of modern pictures. Even painters of the greatest distinction are now by no means sure of disposing of their works, though such works were eagerly sought for and purchased some few years ago; and English art certainly shows no sign of retrogression. I would not therefore by any words of mine encourage the production of pictures as a means of livelihood; but I would do all in my power to advocate the learning to draw, as an accomplishment most useful in itself, as a source of great pleasure to its possessor, and chiefly as a means, and perhaps the most effective means, of approaching the study and appreciation of the beauties of nature. While saying this I would not have us forget that a knowledge of botany, geology, and other branches of natural science is also an important means to this end.

Our national education, in which of course I include institutions of this kind, should, I think, be made to lead the rising generation to regard as something sacred the beauties of the world in which God has placed us, as one of His best gifts to man. They should be taught to look with aversion on everything which tends to degrade or destroy those beauties; on such things as waste paper thrown carelessly about in meadow and hedgerow, on the discarded tins, kettles and other litter which now too often give an untidy, unworthy character to many an otherwise attractive Berkshire village, and, above all, our children should be taught to view with abhorrence the senseless and selfish work of the bill-sticker in spoiling and rendering sordid the aspect of our towns and the charms of the country. It takes, they say, a good deal to rouse the British Lion, but I confess I am sometimes amazed that he takes so quietly, without an occasional roar and lashing of his tail, the disfigurement of his heritage at the hands of the selfish and often gulling advertiser. Not only are the pleasures and dignity of his existence imperilled thereby, but he has to pay dearer for his wares, or else get them of inferior quality, for does he not see millions of money spent annually in advertising, and is he not aware that all this money comes out of his own pocket (if he have a pocket), poor old long-suffering British Lion? Now if he chose, the schoolmaster could cure all this in the course of another generation by exposing such chicanery, and giving our children right views as to their duties and obligations to help keep the world in its beauty for the good and pleasure of all. A healthy anxiety for the enjoyment of others would, I believe, even lead us further. We should be careful that our persons, our houses, our gardens and fields should be as attractive and pleasant as our means would admit of, not to gratify personal vanity, but our own and other's sense of the decorous and beautiful. This generally will be of easy accomplishment. We shall have only to preserve what is beautiful and prevent its disfigurement.

Again, the same spirit would make us careful not ruthlessly to destroy what remains to us of the good work of our ancestors, especially in the way of architecture. The building art in this country was a traditional art up to comparatively modern times; that is to say, the style of a building did not depend upon the whim of its designer. Its style was the style of the day, and though style changed, it changed very slowly and from natural causes. This reality and spontaneity of style gave a charm to old buildings, which modern ones in these eclectic days can never possess, and it behoves us jealously to preserve what has come down to us from the past, not only for our own admiration and profit, but also for the benefit of our children. I hope, therefore, that the town of Newbury will make a strenuous effort to keep intact and in repair its ancient Cloth Hall and Granaries, which are, as I have before remarked, one of the three remaining attestations of its former renown as an important centre of England's commercial and manufacturing activity. Your wealth and your taste may yet give to Newbury many a noble building, but you can never have again another Jacobean Cloth Hall. It is a possession which the town ought to be proud of, and guard against ruin and destruction.

I will conclude my remarks by wishing your new school of

technical instruction success and prosperity. Its premises appear admirably adapted not only for art teaching but for instruction in various other matters in which excellence may be attained by tuition wisely directed under skilled masters. I understand it is contemplated to have a class for carpentry and wood-carving. There is a great future, I believe, for artistic pottery and artistic metalwork in brass and iron, in which much success may be attained even by those whose employments during the day would hardly seem to conduce to such success. Even in our little village of Yattendon articles have been made in brass and copper which have been honoured by the approval of, and purchased by members of the Royal Family, and that without the assistance of a grant from the county council or such excellent premises and instruction as are now at your disposal. I believe that the county councils do not allow of the sale of work actually done in these schools from a consideration for trade interests; but with a view to the future of your pupils I may perhaps remind you that the Rural Industries, a Society formed for the encouragement of work of this kind, with a shop for its display in New Bond Street, is ready to co-operate with them when they have produced works sufficiently creditable for exhibition and sale. This Society has an exhibition for such work at Oxford during the present meeting of the British Association. There is also the Society called the Home Arts and Industries Association, to which Yattendon and perhaps other Berkshire villages are affiliated, which collects in June the work of its branches during the past winter at the Albert Hall, South Kensington, and which is becoming every year more of a success, both from the excellence of its exhibits and the extent of its sales. There is, I cannot doubt, a very bright future for the Newbury school, if its pupils are animated by that enthusiasm and perseverance which can alone command success.

DUMFRIES AND DISTRICT.

THE third field meeting of the Durham and Northumberland Architectural and Archaeological Society was held recently at Dumfries, for the purpose of visiting the interesting ecclesiastical and baronial antiquities in the neighbourhood of that historic town. A large company of ladies and gentlemen, the *Newcastle Journal* says, attended the meeting, and assembled at the Dumfries railway station, on the arrival of the express from Carlisle at two o'clock. The Rev. Canon Greenwell, president of the Society, and Mr. Oliver Heslop, one of the hon. secretaries, had charge of the party, for whom conveyances were awaiting, in which they at once set out to visit Sweetheart Abbey, the ruins of which are beautifully situated at the foot of Criffel, near the mouth of the Nith, some seven miles from Dumfries. The weather being very fine, a most enjoyable afternoon was spent. The party first visited Kirkcudbright House, where they were received by Mr. Maxwell Witham and Captain Stuart, and shown several antiquities and interesting relics of the Stuarts preserved in the house. This Kirkcudbright is not to be confounded with the better known place of the same name in Annandale, famous in connection with the beautiful ballad of "Fair Helen." Originally, however, it had been a Border keep—one of the fortified houses of the great family of Maxwells of Nithsdale—and the baronial features of the building are in excellent preservation, whilst it is embowered amongst fine trees. When the company had assembled on the lawn the Rev. Canon Greenwell in a few words gave a general explanation of the programme of the meeting and of the places to be visited. Mr. Wm. Brown read a short paper on the history of the three Kirkcudbrights of Dumfriesshire and Galloway, with special reference to that which they were visiting, and Mr. C. C. Hodges made some observations on the purpose and the architecture of the Border pele towers.

The company then, under the guidance of Captain Stuart, walked over to New Abbey, a distance of two miles through pretty scenery, under the shadow of Criffel, with Loch Kinder lying at its foot gleaming like a mirror in the sunshine, and the waters of the Solway spread out to the southward, across which the opposite English coast was clearly visible, the background being supplied by the shadowy outline of the Skiddaw range. Having first visited the ruins of a square pele known as the Abbot's Tower and evidently connected with the old monastery, the party walked on to Sweetheart Abbey, close to which nestles the little village of New Abbey. This is one of the finest and best preserved of the ecclesiastical antiquities of the South of Scotland. It was a Cistercian house, the daughter of the more ancient foundation of Dundrennan, near Kirkcudbright. It was founded by the noble Lady Devorgilla of Galloway, of the royal line of Scotland, the wife of John Baliol, lord of Barnard Castle and founder of Baliol College, Oxford. After the death of her husband in 1269, Lady Devorgilla had her husband's heart embalmed and preserved in a silver casket in the abbey, which in consequence was called

"Dulce Cor, Douz Quer," or Sweet Heart. The circumstance is quaintly related by Wyntoun in his rhymed Scotch chronicle of the fifteenth century, which further asserts that the lady whenever she sat down to meat had the casket enclosing her husband's heart placed beside her on the table, and

Till her lord, as in presens,
Ay to that scho dyd reverens.

History records no more remarkable example of devoted widowhood, and has few nobler names than those of the Lady Devorgilla and her husband, whose lives seem to have been devoted to far-reaching works of munificence. Their son became King of Scotland, but was not destined to perpetuate the line, though it is remarkable that after the death of the grandson of Robert Bruce the Crown again reverted to the Stuarts of Galloway, the family of the Lady Devorgilla. The history of the abbey, as far as is known, was sketched by Mr. William Brown. The last abbot was Gilbert Brown, who survived the dissolution and destruction of the monastery by the Presbyterians, and had many a bitter conflict with the reformers. He only escaped the vengeance of the Council in Edinburgh by reason of his hopeless physical condition, and died in France. He is described as "an avowed Papist," and also "suspect to be an usar of magick and other unlauchfull sciences, condemnit be the lawis of God." Poor Gilbert Brown had evidently a hard fate, and might well have adopted to himself the lines of Milton, had they then been written:—

Fallen on evil days and evil tongues,
And old and blind and desolate.

Mr. Hodges gave a most interesting account of the architectural features of the abbey, which partake of the general characteristics of the Cistercian foundations, though with some peculiarities, one of which gives rise to the conjecture that it was built by Scottish masons on a plan supplied by English architects, and that the builders were not familiar with the style and made some blunders in working out the details.

Having inspected the abbey and its interesting precinct wall, and admired the exceeding beauty of the scenery, the party walked up to Chamberley, the residence of Captain Stuart, well situated on the craggy rising ground to the west of the abbey, amidst umbrageous woods, where they were hospitably refreshed with tea. Rejoining their conveyances, and with a hearty cheer for Captain and Mrs. Stuart in recognition of their kindness and hospitality, the party drove back in the cool of the evening to Dumfries, proceeding by the higher road close to the foot of the Galloway Hills. They dismounted at the King's Arms Hotel, where dinner was waiting, and where the party spent the night.

Another beautiful morning welcomed and gladdened the archaeological excursionists next day, who, after an early breakfast, set out. Dumfries certainly looked its very best as the brakes containing the party passed over the bridge into Maxwelltown on the way first to visit the ruins of Lincluden Priory. Regret was expressed by many that time could not have been found for inspecting the pleasant town, which rejoices in the ambitious name of "The Queen of the South," and is interesting, among other features, for its relics of Robert Burns. The church of Greyfriars, passed by the party, is built upon the site of the more ancient edifice in which Robert Bruce stabbed the Comyn, and the site of this "bluidy and sacriligious dede," which determined the destinies of Scotland, is still preserved and marked off in the modern church. Closely adjoining the bridge, over which the high road into the Stewartry crosses the Nith, is the older bridge, originally constructed by the famous Lady Devorgilla, of whom we have already spoken.

Lincluden is famous both as an ecclesiastical antiquity and for its more recent association with Burns, of whom, during his residence in Dumfries in the closing epoch of his life, it was a favourite resort and lounging-place. Burns did not disdain the concomitants of place and scenery as aids to inspiration, and used to linger in the ruined priory until the moon shone in upon him through the traceried windows. There, according to his own statement, he made and revised many of his songs, which were then his principal literary productions. The late George Gilfillan, of Dundee, one of the biographers of Burns, in characteristic verses records the visit he paid to Lincluden Priory in company with Thomas Aird, then living in Dumfries. The lines thus begin:—

To Lincluden Abbey once we walked,
In the cool twilight of a burning day,
With one, a poet of the truest grain,
Who erst on Arksbeck's Mount had tracked the Fiend,
And probed the sultry secrets of his soul.

Gilfillan went to Lincluden for the purpose of realising to himself the effect of Burns's nocturnal visits, but other and less poetical objects attracted the members of the Durham Archaeological Society. The ruins of the nunnery are situated at the confluence of the Cluden with the Nith, on a fine sloping bank close to the first-named stream, which runs through a

beautiful sylvan glen. It was originally a Benedictine nunnery, founded in the latter part of the twelfth century by Uchtred, son of Fergus, Lord of Galloway, but was converted into a collegiate establishment two centuries afterwards by Archibald, the grim Earl of Douglas. The foundation was enlarged about 1429 by Margaret, Countess of Douglas, eldest daughter of Robert III. She died in 1440, and was interred in a magnificent tomb in the choir, which bears a Latin inscription, still easily decipherable. In front of the tomb is a row of nine shields, bearing the arms of Brus of Annandale, Brus of Skelton and others. There is some rich carving in parts of the building, very French in style, as is all the work in the church. A brief description of the building was given by the Rev. Canon Greenwell, who also referred to the circular mound closely adjoining the ruin, which, he said, from the slight examination he had been able to make of it, was evidently one of those so-called mote-hill mounds, common in this part of the country, which were originally defensive places constructed by the British tribes in prehistoric times, and were afterwards used as meeting-places, from which the name mote-hill was derived.

As the day's programme was an extensive one, Lincluden was soon left, and the party drove by way of Glencaple down the left bank of the hill to Caerlaverock Castle, which was reached about half-past eleven o'clock. Caerlaverock is a place of very great interest. It was the stronghold of the Earls of Nithsdale and is still in the possession of Lord Herries, the representative of the family. It is remarkable for the strength of its position as one of the gateways into Scotland, protected on three sides by the Solway Firth and the formerly impassable Lochar Moss. It was a triangular fortress, with a strong tower at each of the three corners, two of which are still standing, and the whole work is in a good state of preservation. It was surrounded by an outer and an inner moat, and the inner moat is still intact and full of water. It is, indeed, the only example of a castle with its moat intact existing in Scotland or in the North of England. Nothing is really known of the history of Caerlaverock before its siege and capture by Edward I. in 1300, of which an account is given in a very curious French poem which has come down to us. It is known, however, that an earlier castle stood on a site some few hundred yards from the present ruin; whilst a wooded height which overlooks the tower, called the Ward Law, contains remains of early fortifications, and may be assumed to have been the original "Caer," or British stronghold, from which the castle took its name. A very interesting account of the history of the castle was given by Mr. Wm. Brown, and the architecture was fully described by Mr. Hodges.

After Caerlaverock had been inspected by the party they returned to their conveyances, and drove on to Ruthwell, where the famous Saxon cross, with the Runic inscription, situated in the parish church, was viewed, and a full and interesting description was given of it by Canon Greenwell, and of the reading of the inscription by the late Mr. Kemble. A movement was next made to the railway station to meet the afternoon train which bore the party back to Carlisle. There the cathedral was visited, and the company dined together, and returned in the evening to Newcastle and their several destinations. There was but one opinion, that the meeting had been one of exceptional interest, the pleasures of which had been greatly enhanced by the fine weather enjoyed throughout. Mr. Heslop, who had charge of the party and the arrangements, was deserving of special praise for the assiduous manner in which he provided for the comfort of all the party and the promptitude with which he kept them up to time.

THE GUILDHALL ART COLLECTION.

THE library committee of the Corporation have published their report on their recent art collection at the Guildhall. The paintings exhibited were on view during April, May and June, and all of them were insured at Lloyd's. In all 300,366 persons passed the turnstiles, being an average of 3,580 per day. In obedience to the instructions of the Court of Common Council, the exhibition was opened to the public on alternate Sundays between April 22 and July 1. The total attendance on the six Sundays was 17,530, showing an average of 2,921 each Sunday. On each occasion the greatest order prevailed, no single instance of damage or disturbance having occurred. The descriptive and historical catalogue prepared by Mr. A. G. Temple, the art director, was much appreciated, 38,569 copies having been sold at 6d. each, realising 964*l.*, which had been found not only sufficient to defray the entire cost of the catalogue, but to leave a balance at the committee's disposal which would enable them to dispense with the greater part of the amount of 450*l.* granted by the Corporation to defray the expenses of the exhibition. The committee conclude by referring to "the excellent, experienced and skilful manner in which Mr. Temple, the director and secretary of the art gallery, has

discharged his duties, and the marvellous success which has attended his exertions by the organisation of the three art loan collections in Guildhall." The total net cost of the exhibition seems to have been 443*l.*

GREEK PICTURE-WRITING.

IN the section of Anthropology at the meeting of the British Association on Saturday, Mr. Arthur J. Evans read a paper on "A New System of Hieroglyphics and a Pre-Phœnician Script from Crete and the Peloponnese." He commenced by referring to the wide-spread existence of forms of picture-writing amongst primitive peoples. It stood to reason that analogous systems had once existed within the European area, and some traces might still be perhaps found in such prehistoric relics as the mysterious figures known as the Maraviglie, carved on a limestone rock in the heart of the Maritime Alps. He himself had found painted pictographic designs of a like nature on a Dalmatian cliff, and in Lapland they might still be said to survive. But evidence of the existence of a fully-developed hieroglyphic system on European soil had been hitherto lacking, though recent discoveries had established the fact that in Asia Minor, the prehistoric remains of which showed such intimate connection with those of the Greek and Thracian lands, a hieroglyphic system had grown up, independent of the Egyptian, to which the general name of "Hittite" had been given. The revelations, begun by Dr. Schliemann at Tiryns and Mycenæ and still accumulating every day, had brought to light on the soil of Greece itself a very ancient civilisation, in many respects the equal contemporary of those of Egypt and Babylonia, and they might well ask themselves, Was this civilisation wholly dumb? Were the Mycenæans so far below many savage races as to have no written form of intercommunication? Homer at least contained a hint that some form of written symbols was in use. During a journey to Greece in the preceding year he himself had obtained a clue to the existence of a peculiar kind of seal stones, the chief find-spot of which seemed to be Crete, presenting symbols of a hieroglyphic nature. This spring he had been able to follow up his inquiries by the exploration of the ancient sites of Central and Eastern Crete, and the results of his researches had been to bring to light a series of stones presenting pictographic symbols of the same nature, so that he was now able to put together over seventy symbols belonging to an independent hieroglyphic system. More than this, he had discovered, partly on stones of similar form, partly engraved on prehistoric vases and other materials, a series of linear characters, a certain proportion of which seemed to grow out of the pictorial forms. Both these systems of writing were represented on the diagrams before them. It would be seen that, as in the case of the Egyptian and Hittite symbols, the Cretan hieroglyphs fell into certain distinct classes, such as parts of the human body, arms and implements, animal and vegetable forms, objects relating to maritime life, astronomical and geometrical symbols. Some of them, such as the two crossed arms with expanded palms, belonged to that interesting class of pictographs which is rooted in primitive gesture language. The symbols occurred in groups, and there were traces of a boustrophedon arrangement in the several lines. The comparisons instituted showed some interesting affinities to Hittite forms. Among the tools represented Mr. Evans was able to recognise the "template" or "templet" of a decorative artist, and with the assistance of a model of this symbol, taken in connection with a design supplied by a Mycenaean gem found in Crete, he was able to reconstruct a Mycenaean painted ceiling analogous to those of Orchomenus and the eighteenth dynasty Egyptian tombs of Thebes (c. 1600 B.C.). The linear and more alphabetic series of symbols was shown to fit on to certain signs engraved on the walls of what was apparently a Mycenaean palace at Knôsos, and again to two groups of signs on vase handles from Mycenæ. It was thus possible to reconstruct a Mycenaean script of some twenty-four characters, each probably having a syllabic value. It further appeared that a large proportion of these were practically identical with the syllabic signs that survived among the Greeks of Cyprus to a comparatively late date. This Cypriote system threw a light on the phonetic value of the Mycenaean. Reviewing the results arrived at, Mr. Evans said that they had now before them two systems of primitive script—one pictographic, the other linear—both, as was shown by the collateral archæological evidence, belonging to the second thousand years before our era and to the days before the Phœnician alphabet had been introduced among the Greeks. The relations of these two forms of script to one another still needed elucidation, and they certainly overlapped one another chronologically. Some pictorial forms, however, of the one class clearly appeared in a linear form in the other, the double axe, for instance, being found in two stages of linearisation—the simpler form identical with the Cypriote character *le*. On the whole, the pictographic o

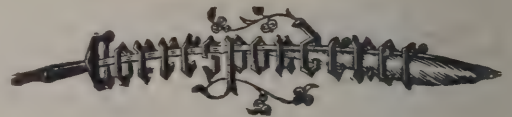
hieroglyphic series seemed more peculiarly indigenous to Crete, and the linear forms to be Mycenaean in the widest sense. The Eteocretans, or indigenous stock of the island, who preserved their language and nationality in the easternmost district of Crete to the borders of the historic period, certainly used these hieroglyphs. Mr. Evans gave reasons, based on his recent archaeological discoveries in Eastern Crete, for believing—that what had long been suspected on historic and linguistic grounds—that the Philistines, who, according to unanimous Hebrew tradition, came from the Mediterranean islands, and who were often actually called Krethi in the Bible, in fact represented this old indigenous Cretan stock, and that they had here the relics and the writing of “the Philistines at home.” In Egyptian monuments these people, who came from the “islands of the sea,” were seen bearing tributary vases of forms which recurred on a whole series of engraved gems seen or collected by Mr. Evans in Eastern and Central Crete. Their dress, their peaked shoes, their long hair falling under their arms all reappeared on Cretan designs representing the inhabitants of the island in Mycenaean times. In view of these facts, Mr. Evans asked whether certain remarkable parallels observable between some of the Cretan pictographs and the earliest forms of Phœnician letters might not best explain themselves by this early Cretan colonisation of the Syrian coasts.

THE LATE JOSEPH BOULT.

A MEMBER of an old Liverpool family of repute and a gentleman whose name has long been associated with literary and artistic pursuits has passed away, says the *Liverpool Courier*. To the younger generation of Liverpool men, Mr. Joseph Boulton, who died at his residence in that city on the 9th inst., in his 77th year, might be little known, but not many years ago he exercised a great influence and spoke with considerable authority upon many matters of public interest. Possibly on some of the subjects he discussed his views were regarded as advanced and even impracticable; his manner of expressing his opinions was not always of the most happy character; like other men of ability, he at times could ill brook opposition, particularly if he considered it was the outcome of prejudice or ill-formed thought; but his sincerity was never questioned, and when he took any question up he followed it with a vigour and persistency which even those who differed from him were compelled to admire. He was a ready speaker, apt debater and a fluent writer, and these capacities made Mr. Boulton a foremost figure years ago in local learned society, and he could hold his position in recondite discussions when participated in by such cultured men as Sir James Picton, Frank Howard, Louis Hornblower, Ginsburg, Weightman, Nevins, Moore, Mayer and others. Physical troubles impelled him to withdraw from the active studies and scientific pursuits that for many years engrossed his life, but up to the last his keen analytical intellect closely followed the varied developments of science and art as they arose. Did he not in recent times design a scheme for meeting the growth of the Atlantic passenger trade by providing protected berths near the river wall at the north end, with a railway to the landing-place and hotel convenient? His ideas developed no further than plans, but these showed that the designer had intelligent views of the necessities of the situation. Some of his older associates who still remain recollect his charming conversational powers, his facility as an essayist and fluency as a speaker, and above all that kindness which was always ready with encouragement and help for those who might be in need of it. Although recently retired from active public life, the death of this kindly cultured gentleman will be heard of with sorrow by all who knew him or were acquainted with his merits.

Mr. Boulton belonged to a notable Liverpool family, the members of which have for many years taken an active part in mercantile, municipal and learned life of the city. Some of them have been distinguished as public speakers, as writers, and as the organisers and heads of some of the great commercial undertakings of Liverpool. The deceased was the youngest son of the late Mr. Francis Boulton, a well-known Liverpool merchant, who died in 1848. One of his relatives, Mr. Swinton Boulton, founded and for many years managed one of the greatest insurance undertakings in the world—the Liverpool, London and Globe Insurance Company; and Mr. Francis Boulton, for many years prominently engaged in the American and Australian trade, was the founder of the Financial Reform Association, and was connected in commerce and public affairs with Robertson Gladstone, Lawrence Heyworth, C. E. Rawlins, Charles Holland, and other leading merchants of that period. Mr. Joseph Boulton possessed all the energy and public spirit of his race, and whatever he undertook, whether of a public, private or artistic character, he carried out with characteristic thoroughness. Originally intended for mercantile pursuits, the bent of his mind was directed to art. At an early age he was articled to a Liverpool architect, and soon obtained a reputation for aptitude and

careful study of questions affecting his profession. He visited all the principal cities of the Continent, and was familiar with the architectural details of some of the most famous edifices in the world, and could communicate his knowledge in brilliant language of artistic and architectural beauties that had engaged his attention. Few men were more familiar with the different peculiarities of the different schools of architecture, ancient or modern, than Mr. Joseph Boulton. He could discuss them with learning and describe them in a practical and popular way. He also had an intimate acquaintance with the great engineering and architectural works of modern times, and this knowledge was used by him with advantage during his long professional career. His ability and learning were recognised by his professional brethren on more than one occasion. He was a Fellow of the Royal Institute of British Architects and a member of various learned societies. Among the local bodies with which his name was connected were the Liverpool Architectural, the Philomathic, the Literary and Philosophical Societies and others. He occupied the presidential chair of the Architectural Society, and at different times read many important papers bearing upon architecture, sanitary science and art. During the erection of the new Exchange buildings, Liverpool, he was selected by that distinguished architect, Mr. Wyatt, of London, who designed the structure, to be superintendent architect in the carrying out of the work. This important function he discharged with ability and conscientiousness, obtaining the approval of his principal and the proprietors of the Exchange. To his death he remained the consulting architect of the Exchange Company, and for years had practical control of the company's buildings. His other work was chiefly in connection with sanitary undertakings, but he was also consulted in various important and local architectural matters, and his wisdom and experience, guided by a cultured, artistic taste, gave exceptional weight to his opinions, while his high personal character obtained for him the respect of all who knew him.



The Silent Flush-out Closet.

SIR,—Can you tell us who are the makers of a closet bearing the following inscription:—“The Silent Flush-out Closet, with Patent Fan, 1885, '86, '88?” “IRON.”

GENERAL.

Crowborough Church is to be restored under the direction of Mr. M. B. Teulon.

The Board of Manufactures have come to the conclusion that it will be necessary to discontinue the opening of the National Gallery, Edinburgh, on Saturday evenings during the dark months of the year, in consequence of the very serious injury to the pictures by the fumes from the gas. Apparently the Board have yet to learn that electric lighting is an actuality and can be employed in picture galleries.

The Board of the Liverpool School of Agriculture and Applied Arts will appoint an instructor in sculpture and modelling at 250*l.* a year, and one in decorative and figure painting at 150*l.* a year (each to have a two-thirds share of fees), besides craftsmen to teach wood-carving, wrought-iron work, and brass and copper-work, the salary of each being 45*l.* a year.

Mr. C. E. Lees, who presented the Oldham Art Gallery with pictures of the value of over 30,000*l.*, died near that town on Saturday.

Mr. Reuben Farley, the mayor of West Bromwich, has purchased the old Oak House, which dates from the sixteenth century, and has offered it as a gift to the borough.

Mr. Vicat Cole, R.A., is at present at Bolton Abbey, engaged on another view of that landscape.

A Petition for the grant of a supplementary charter has been presented by the Royal Scottish Academy. Petitions for or against the grant are to be sent in to the Privy Council Office before September 12.

The Design by Mr. R. G. Thomas, of Menai Bridge, has been selected in the competition for the New Welsh Calvinistic Methodist Chapel at Llangefni, Anglesey.

The Foundation-stone of the Verdin Technical Institute has been laid. The architects are Messrs. Woodhouse & Willoughby.

The Restoration of the tower and spire of St. Leonard's, Thryberg, near Rotherham, is about to be undertaken under the direction of Mr. Hodgson Fowler, F.S.A.

The Hastings School Board have arranged to borrow 5,350*l.* for the erection of the Bo-Peep School.

The Architect.

THE WEEK.

THE late Mr. WYATT PAPWORTH was so disinterested in his labours to increase the knowledge of architectural history, there can be only regret for his death on Sunday last. He died at the Soane Museum, of which he was the worthy curator for a brief period, during which he tried to make it more useful than it had been in preceding years. Mr. WYATT PAPWORTH belonged to a family that was long associated with the arts. He possessed sufficient ability to gain a prominent position as a practising architect. But the materials with which he preferred to work were books and manuscripts, and he undertook inquiries which needed more than the leisure hours of a life. When the Dictionary of Architecture was started his collections formed an important part of the literary capital of the venture. His aid was also to be relied on by all the contributors. But in a short time it became evident that if there was to be a Dictionary Mr. WYATT PAPWORTH would have to compile the greater part of the pages. He performed his onerous task as well as he could, but more was required in a work of the kind than he could furnish. From his connection with the Dictionary he was supposed to be competent to edit GWILT's "Encyclopædia." In this case also Mr. WYATT PAPWORTH was hampered by circumstances. The changes he made in successive editions are evidence of the difficulty of his task. Objections to its character have been raised from time to time, but it is well to remember that the big volume continues to be useful, and it is not likely to be superseded. The companion work on civil engineering has become obsolete, and without Mr. WYATT PAPWORTH's tact and industry "GWILT" must have shared that fate. In his various papers he has collected interesting information which will save trouble to future inquirers. His life could not be called prosperous in the ordinary sense of the term, but he rendered more services to architecture than men who gained greater prominence in the eyes of the world, and in the harbour of refuge which was opened to him he was likely to find means to confer further benefits on his brethren.

THE condition of the pictures in the National Gallery and the remedies for the decay are still subjects for controversy. Sir J. D. LINTON and Mr. J. ORROCK attributed the evil to the excessive dryness of the atmosphere, and proposed the introduction of water-troughs. Sir J. C. ROBINSON, who has charge of the Royal collection, doubts if much evil actually results from the fluctuation of temperature in public galleries. In Buckingham Palace there are no abnormal fluctuations, yet WILKIE's pictures have been cracked. Mr. ARTHUR KAY, of Glasgow, considers the English climate is moist enough already, and does not need the addition of water-troughs. He says that damp affects pictures on canvas most seriously, and in a part that is frequently overlooked, viz. the back of the canvas itself. Any moisture in the air which can reach the back of pictures, particularly by causing the walls to "sweat," is most destructive. The vegetable fibre in canvas readily and rapidly absorbs moisture, and this causes contraction of the fibres. Mr. KAY believes that a valuable picture was damaged in London some years ago by the custodian opening a window near it for a few minutes on a foggy day; and he has seen pictures ruined by being rubbed with a damp cloth. Atmospheric moisture is not less inimical to art than ingeniously christened and copal "faked" old masters. Mr. KAY's remedies are pure air, the electric light, an even temperature and protection of the canvas from moisture on the back (and in smoky towns on the front) to preserve pictures. But he holds that the bituminous works of British artists will be short-lived, in spite of anything restorers or water-troughs can do; and art lovers should avoid works containing this attractive but perishable pigment. The artist who would build a lasting memorial must give careful thought both to what he paints on and what he paints with. The painter

who uses perishable pigments is as one who carves his own monument in sand. Mr. E. R. ROBSON considers it is imperatively necessary at the National Gallery to admit fresh air to all the rooms in much larger volume than is ever thought of, to filter it from dust and dirt at its entrance, to moisten it sufficiently to compensate for the abnormal dryness otherwise arising from heating by hot-water pipes, and finally to exhaust it thoroughly and continuously.

ALTHOUGH the subject of education can have little interest for the House of Commons at the close of a session, Mr. ACLAND was able on Tuesday to offer a statement that was not unsatisfactory. He announced that he was endeavouring to get rid of the military officers who as inspectors are the tools of the officials at South Kensington, and to substitute "a younger and a really intelligent class of inspectors who will be able to carry on the work of the Science and Art Department more on the lines of the best work of Whitehall." It is an advantage to have any sort of check on the South Kensington rule, but much more is required than a game of see-saw between two sets of officials. Who can guarantee that Whitehall will not eventually have to go under? The efforts to improve the denominational school buildings have been successful. Although attempts were made by committees to pose as Christian martyrs because they were asked to make the schools less dangerous, the good sense of the country supported Mr. ACLAND. The appointment of an itinerant architectural adviser to explain requirements has been advantageous. If architects were called in by the managers there would be no need for the new official, but it was supposed to be policy to avoid the ordinary way of meeting the obligations. The demand for drain pipes, ventilators, dry buildings, playgrounds and the like was assumed to be an attack on doctrine which it was a duty to resist. That the children could have any claims was not admitted. But in spite of all the allegations of tyranny the committee of the National Society have had to own that no undue pressure was exercised by the Education Office, and when the condition of many of the buildings is borne in mind, we are surprised so much tolerance was shown to perverse managers who were ready to sacrifice the health of children so long.

How slight a cause can determine a competition has just been exemplified in Sheffield. The School Board invited architects to submit plans for the Tinsley Park School. In the instructions the words "must" and "should" were sometimes used as equivalents. While some competitors considered they were bound to follow the conditions literally, others interpreted them as conferring more or less liberty. The accepted design, which was marked "Sangler Rouge," contained three infants' classrooms, which the majority of the competitors contended were less than the number suggested by the conditions. Their protest was supported by the Sheffield Society of Architects, as will be seen from the correspondence in another column. At the meeting of the School Board it was admitted that the instructions were not sufficiently explicit, and in future cases it was suggested that imperative conditions should be separated from those which were only suggestive. It is not creditable for a School Board to be compelled to confess that they are incompetent to draw up a few instructions which everybody can understand. The successful competitors may deserve the encomiums they received for interpreting the document not as it was expressed, but according to its hidden meaning. The design probably merits selection, and we are not going to say one word against it. But we think that cases which involve the expenditure of a large sum of money should not be made occasions for offering riddles. The Board in their visits to their schools may sharpen the wits of the children by proposing verbal puzzles, but architects who spend time and money with only a slight chance of a return should be spared a mental exercise of that kind. However, it is only one among several instances which reveal the slight esteem which the public bodies of Sheffield have for local architects, and for which there may be reasons that are not revealed.

WATER SUPPLY OF TOWNS.*

LAST week we noticed a book by an English engineer who is a Professor in Sydney. To-day is the turn of one by another Englishman, the Professor of Sanitary Engineering in the Imperial University, Tokyo, Japan. The volume on construction in iron and steel will have to seek approval among a crowd of rivals, for the subject has a sort of attraction, and some men are more curious to discover whether a new treatment of it is practicable than to expect information. The subject of water supply has received much less attention. For years it might be supposed to be the Cinderella of civil engineering. The neglect was not due, however, either to the lack of importance in the subject or to its unprofitable character. It arose rather out of the incompetence of Parliament as a high court of science. Waterworks could not be carried out without an Act, and the process of obtaining one created a monopoly. Thirty years ago all works of the kind were in the hands of three or four engineers. If an outsider prepared plans for a new water supply he could not expect to gain approval for them unless he was supported by one of the very few specialists. The tactics of the opponents were almost of a stereotyped kind. Suppose the Bill came before a committee of the Lords. After the engineer gave his evidence, the cross-examining counsel would begin by asking him to describe his experience in the construction of waterworks. Although he might have been engaged in engineering works during many years, it was likely that he did not attempt to break down the BATEMAN HAWKSLEY monopoly at an earlier time. The witness would therefore attempt to explain that the proposed works corresponded in a great measure with those he had carried out. Counsel would then insist on a plain answer, a yes or a no, to his own most simple question. The witness would be compelled to own that he had not constructed waterworks. Then would come abundant abuse of the engineer for having dared to come before the noble Lords as if he were a competent man in order to give evidence, and it would appear as if a crime had been committed by which the severest penalties of traitors were incurred.

Only in a parliamentary committee-room is it possible to realise the awful consequences which follow the slightest departure from procedure. An error in drawing a line on one of the wall-maps can be made to appear as an attempt to upset the constitution. An engineer in the position we have described might expect to hear that the preamble of the Bill was not proved. The tactics did not originate with waterworks. When railway schemes were started efforts were made to overthrow GEORGE STEPHENSON on the ground that he was without experience, and when his son designed the Britannia Bridge he was obliged to propose the use of chains for holding up the beams in order to lessen the apprehensions of the parliamentary committee, because he had not spent his life in the construction of tubular bridges. How long the old prejudices can survive was seen in the case of the Liverpool Waterworks. The Corporation were compelled to allow Mr. HAWKSLEY to take the most prominent part in the committee-rooms, although there was no intention to retain his services when the Bill had passed. The designer of the works, and who was to assume all the responsibility for their success, in the proceedings before Parliament appeared of little account. The people of Liverpool were, in fact, compelled to pay a large sum to bamboozle legislators to whom plans were mysteries.

Fortunately for sanitation the barriers of the most narrow of professional circles have been broken down. Waterworks are no longer believed, either in or out of Parliament, to be the most difficult of all branches of engineering. In consequence, the number of men who can take a professional interest in the subject is increased, and we may expect that many books will be forthcoming for their benefit. Messrs. CROSBY LOCKWOOD & SON, who brought out books on subjects connected with hydraulics at a time when, thanks to Parliament, students were not numerous, have enriched their collection with a comprehensive volume by Mr. W. K. BURTON. The author

does not restrict himself to his own works. His book exemplifies the latest practice, and will serve as a guide to novices, while it can be very often suggestive to engineers in practice.

The discovery of a source of supply is attainable only by acquaintance with the peculiarities of a gathering ground. Nature has occasionally provided natural reservoirs like Loch Katrine, Thirlmere, Lake Vyrnwy, &c., but in the majority of cases supplies have to be derived from sources which to ordinary eyes appear most inadequate. In England the data which Mr. SYMONS has acquired are invaluable in suggesting the probable rainfall of a district, and much of the late Mr. HAWKSLEY's success was due to the accumulation of similar information. But cases are constantly arising where statistics are at variance with the condition of a district. One is related by Mr. E. EASTON as occurring near Brighton. We are told how "he observed that over a large area of ground near that town no stream of any kind was to be seen. He also noticed that along the seashore there were, especially at low water, innumerable rills of water passing through the sand, and he found that this was fresh water, the fact being that the ground is so porous that the rain all soaks into it, and makes its way underground to the sea. In this case by driving a tunnel parallel with the seashore, and at the depth of low water, a plentiful supply of fresh water was obtained." Many other cases could be given of supplies that were derived from places which appeared to be as unyielding as the rock struck by MOSES. The engineer acts on the belief that the greater quantity of rainfall is not evaporated, and his business is to discover where it is concealed. In this country it is well to remember that the underground stores of water go through a process of natural filtration, and consequently the Rivers Pollution Commissioners were not afraid to declare that among the varieties of potable water the best for dietetic purposes are spring and well water. With the means that are now available for boring and pumping, supplies of that kind are easily obtained.

One of the objections to underground supplies arises from the uncertainty of discovering the quantity that is obtainable. It is easy to calculate the delivery in a certain number of hours or days, and to assume that the yield will go on for ever as abundantly. But public authorities who have more than a financial interest in a supply can hardly be satisfied without reservoirs which will afford an ample provision for many days. Formerly it was considered that public granaries were indispensable. Railways and steam vessels have made them unnecessary, but it would be absurd to rely on foreign sources for water. Climatic variations have affected the calculations which used to be adopted for determining the capacity of the reservoirs. Last year it was necessary to consider whether restrictions should not be imposed in Glasgow, which was supposed to possess an excessive supply in the Highlands. In Dublin there was a panic when it was found the great reservoirs were running dry; that is, in a country where rain is supposed to fall every day. The Vyrnwy reservoir has an area of 1,120 acres, or three times the area of Hyde Park, and yet doubts have been raised about its sufficiency to meet the needs of Liverpool in the future. A two months' supply is now considered to be necessary for all large towns if emergencies are to be provided for.

In a populous district the existence of an artificial lake or reservoir of large area often excites apprehensions of danger. When dams or embankments burst in England the consequences are serious. Whatever the material, clay and puddle or masonry, there must be quantity as well as quality in the work. The Americans, who take a pleasure in defying contingencies, are as economical in their embankments as in their steel bridges. But with them insurance can compensate for constructive freaks. The dam 270 feet high, which was proposed in connection with the water-supply of New York, would probably find its warmest supporters among the insurance agents. During the construction of a big dam an engineer has an anxious time, and especially in the East, where he has only native workmen at command. Mr. BURTON mentions that for the Hong Kong waterworks, Mr. DRANGE, the engineer, "finding Chinese masons untrustworthy or unable to do a style of work of the excellence necessary for masonry dams, constructed a con-

* *The Water Supply of Towns and the Construction of Waterworks.* A Practical Treatise by W. K. Burton, C.E. London: Crosby Lockwood & Son.

siderable dam entirely of rubble concrete with a cut-stone facing." The dam is over a hundred feet high, and varies in width from 76 feet 6 inches at the foundation-block to 23 feet 6 inches at the top. A case of this kind suggests the advantage of having the responsible engineer on the spot. If the work had been carried out according to directions from one of the offices in Great George Street it would probably have succumbed under pressure.

The discovery of the prevalence of microbes is not without effect on the arrangements for filtering, and may lead to a change in the arrangement of the beds. Dr. KOCH, of Berlin, considers that the process should take a long time, and he recommends a speed of $7\frac{3}{4}$ feet in twenty-four hours as the utmost. But, as Mr. BURTON remarks, there cannot be any hard-and-fast rule applicable to all cases, for much will depend on the condition of the water, the character of the sand, &c. He considers that a maximum filtering speed of 10 feet in twenty-four hours is quite permissible. The cleaning of the beds, or rather the upper layer of sand, should be undertaken at intervals of about ten days. The process in some places is less urgent, for at one of the works in Japan "water has been passing through a set of filter-beds for several years without their having been cleaned or showing any approaching need of cleaning." Besides filtering, water may require to be purified and softened. In connection with this important work the use of spongy iron as devised by Dr. WILLIAM ANDERSON has produced a marvellous result in Antwerp at a small expense, and is likely to produce a revolution in waterworks unless the conservatism of the resident and consulting engineers impedes improvement.

The care of the engineer is far from ending when he has insured a sufficient supply of purified water. Difficult duties arise in connection with the service reservoirs and the multitude of details belonging to distribution. In all these cases, happily for himself, he has the skill of many practical men to aid him. Mr. BURTON frankly says, "Any engineer who takes up waterworks practice will naturally provide himself with a collection of the catalogues of the well-known manufacturers whose specialty it is to provide fittings for waterworks, and from these he will get a very good idea of the numerous minor fittings." It is more honest to reveal obligations in that way than to pretend to be the creator of every appliance. In the same spirit Mr. BURTON suggests that it is wiser and more economical to trust to the manufacturer than to be inventive or over-precise in prescribing qualities which are only shams, as when he says in his remarks on specifications:—

There is something to be said for specifying merely the working pressures and the test pressures that the pipes will be subjected to, allowing the pipe founder to fill in the thicknesses and weights. The reason is that some pipe founders prefer to use iron of greater tensile strength than others, reducing the thickness of the pipes accordingly. In such a case the engineer, in considering tenders, must be careful to observe that the thickness is really sufficient for safety, and that an unscrupulous tenderer has not reduced the thickness of pipes to a dangerous degree in hopes that, by the reduction in price he can thereby allow, he may get the contract. There is a good deal to be said, too, for allowing the tenderer to tender for the form of socket that he has been in the custom of making. A pipe founder is just as likely to know a good form of socket from a bad as most engineers, and we may be sure that, in the case of a pipe foundry, if the routine of the establishment has to be altered, the alteration has to be paid for. Any pipe founder can quote a lower price for a pipe of the form he has been accustomed to cast than one of a new form, at any rate, unless the quantities to be turned out be very large.

These words suggest the advantage derived by civil engineers from their technical skill, which enables them not only to appreciate the efforts of manufacturers but their honesty also. As both classes of men interchange their offices and meet on the same footing in the great Institution, they have a common respect for efficiency. The words are also suggestive of the character of Mr. BURTON's book. He does not write as a theorist, but as an engineer who has gained knowledge by experience, and who is eager to make the way easy for students and others who will have to undertake responsibilities like his own. He therefore departs from the usual plan adopted for books of the class, and avoids creating those difficulties which rarely arise. Every page has a relation to realities and imparts the knowledge which will hold good in working.

Mr. BURTON hopes that his work may prove of special interest as well as utility to Japanese students. Japan,

which at the present time has contrived to attract universal attention—and so big an advertisement is worth much to a commercial country—appears to be as eager about hydraulics as about military affairs. The expectation of a diminution of the number of fires is an incentive to costly works. It cannot be said they are solely inspired by a desire to imitate Europeans. Mr. BURTON says, "There can be no doubt that from the time, nearly three centuries ago, that Tokyo, the capital of Japan, was supplied with water by the Tamagawa canal, supplemented by a complete system of ingenious wooden pipes of square section, till about the beginning of this century, it had a better supply of water than either London or Paris, or probably any town in Europe of which the natural supply was not exceptionally good." If compared with Europe, the country may be said to have advantages as well as disadvantages. As in other parts of the East, the "paddy" water that runs off fields contaminates streams. But the worst enemy is the earthquake. From the following passage it would appear that the remote effects of the disturbances can be serious:—

On the occasion of the great earthquake of 1891 in Japan, a strong partition wall of the service reservoir of the Yokohama Waterworks, some 200 miles distant from the origin of the disturbance, was overturned by the lashing backwards and forwards of the water, although the reservoir was not otherwise damaged. Even the water in a small rectangular reservoir of the waterworks of the Imperial University of Japan (size 82 feet by 25 feet by 20 feet deep) was thrown into waves about 3 feet high, and these effects were at places where the earthquake was but slightly felt. What would have been the fate of a large impounding reservoir had there been one in the part of the country most disturbed, it is impossible to say. Only two observations are to be made. The writer has not heard of the bursting, at the time of earthquakes, of any of the small reservoirs with earthwork dams made by farmers to store water for irrigation. And, further, if every engineering structure had to be made so that it would stand such shaking as that at the worst of the great earthquake of 1891; no engineering structures would be made in Japan at all, nay, no structures of any kind, for what will stand when the very mountains are riven and partly overturned?

Elasticity is to be desired in the structures set up in earthquake countries, and from the absence of that quality concrete does not appear to be applicable as a material for reservoirs. Water towers are also risky, and where tanks must be elevated wrought-iron supports are the safest. Mr. BURTON has been able to obtain valuable suggestions on the subject of construction in countries liable to earthquakes from Professor JOHN MILNE, F.R.S., who holds the foremost place among students of seismological phenomena. The following passage will suggest the precautions that have been taken in various countries:—

In making foundations, experiment and experience have shown that great advantages result from allowing the building to rise from a basement with an open area surrounding it, the motion at a distance, removed from the origin of a disturbance, being not unlike that of water waves, the amplitude of motion of which is less beneath the surface than it is on the surface. Regulations in certain parts of Italy respecting buildings require that, when they are erected on soft ground, the foundations should consist of a platform of masonry or concrete, to extend from 3 feet 2 inches to 4 feet 9 inches in every direction beyond the base of the building, the platform itself being, for a one-storey building, 2·3 feet thick, and for a two-storey building 3·91 feet thick. In Japan several buildings have been erected on what are called "free foundations"; that is to say, the buildings are carried on a layer of shot or iron balls. On account of the movement experienced at the time of high winds, and also for other reasons, such construction is not to be recommended.

Another principle of great importance which is not to be neglected when designing high structures is that the stresses arising out of earthquake motion, that have to be contended against, are to a large extent applied horizontally. For example, ordinary archwork is condemned in Italy, Manilla and other places where earthquakes are frequent, as being unsafe. In Ischia it is allowed underground, where the motion is less than on the surface; even in this case it is specified that the arches have a rise of one third of their span, and that the minimum thickness of the crown shall be 0·82 foot (one brick) thick. The height to which walls are allowed to be carried in the Island of Ischia for two-storeyed buildings is 32·8 feet. Walls of 13 feet high, constructed of simple masonry, must have a thickness of not less than 2·3 feet.

The interest belonging to information of the kind we have extracted should be enough to suggest the advantage of local knowledge when waterworks are proposed.

A Picture by William Dyce, R.A., representing St. John leading home the Virgin Mary from the Sepulchre, exhibited at the Royal Academy in 1860, has been presented to the National Gallery, and is hung in Room XIX. The donor wishes to remain anonymous.

ENGLISH WATER-COLOUR ART.

THE Whitworth Institute in Manchester is suggestive of science, and especially of a place devoted to demonstrating that science is measurement. Somehow art has gained a footing in it. The committee probably were not long before they discovered that science cannot become alluring to artisans. It was resolved to provide "for the collection, exhibition and illustration of works of fine art in various departments, and for their historical and æsthetic study." Out of the surplus from the Jubilee Exhibition sums amounting to 45,000*l.* were allotted to the Institute, 20,000*l.* being for the purchase of works of art. Afterwards the schools were made over to the Corporation, and the committee were free to realise and develop their resolution concerning art. They commenced to purchase examples. Donations came to them. Mr. WATTS, R.A., generously presented his *Love and Death*, for which he had refused a large sum. Mr. J. E. TAYLOR gave 4 oil-paintings, 154 water-colour drawings, and 127 drawings by W. MULREADY, R.A. Other gifts followed. Mr. HORSFALL bestowed 500*l.* for the purchase of water-colour drawings, having places within thirty miles of Manchester for subjects. Unfortunately there is not as yet a suitable building for exhibiting the collections. They have been placed in a small house in Whitworth Park, where a great many people seek them. Galleries will, however, be erected.

In order to increase the usefulness of the collection a catalogue has been brought out in two editions, one very cheap, the other more costly on account of its size and illustrations. The introduction and biographical sketches by Mr. MONKHOUSE and Mr. BANFIELD, the curator, supply the information which is likely to be desired by the ordinary visitor, and will enable a mechanic to appreciate the value of drawings that will appear childish efforts if compared with the oleographs he sees in the shop windows or in his own house.

The collection of the Whitworth Institute is of undoubted value as exemplifying the progress of water-colour art in England. The earliest is a drawing in sanguine by HOGARTH, which corresponds in treatment with his *Garrick as Richard III.*, which is more modern than most of the satirist's works, for it corresponds with what is still seen in the performance of the play, or at least on the provincial stage. HOGARTH could express his thoughts more vigorously in oils or on a copper-plate than by water-colours, and the sketch in the Institute seems to be intended for some temporary purpose. A drawing of Richmond by WILLIAM TAVENER belonged to PAUL SANDBY. Although the work of an amateur it has a historic value, for it is evidence the art was practised in a modest way in the first quarter of the eighteenth century, and who can say TAVENER was the only proctor who attempted to represent the beauties of Sheen? By a contemporary, SAMUEL SCOTT, who was an able marine painter and has left a vigorous view of London Bridge and other sights of London, is a view of Twickenham. It is strange that the half-savage blood of PETER THE GREAT was destined to be an influence, for his son, ALEXANDER COZENS, made the art popular by adapting it to the capacities of fashionable people, and his grandson JOHN R. COZENS was described by CONSTABLE as the greatest genius that ever touched landscape. The elder artist is represented by a view near Chamouni, the other by five Italian views.

There are drawings by several other eighteenth-century artists, which are worth attention as indications of the slow progress of the art, such as THOMAS and PAUL SANDBY, DOMINIC SERRES, WILLIAM HEBERT, POUNCY, W. MARLOW, NICHOLAS POCOCK, WILLIAM PARS, MICHEL ANGELO ROOKER, T. HEARNE, R. CLEVELLEY, F. WHEATLEY, T. MALTON (the Young Painter's Maulstick), who was one of TURNER's teachers, J. SANDERS, SAMUEL ALKEN, ATKINS, J. I. RICHARDS and F. NICHOLSON. There are three of STOTHARD's book illustrations, which are far more charming than many of the ambitious drawings which are now produced, and it must be said that full justice has not been rendered to the artist as a water-colour draughtsman. There are drawings by him in the British Museum which are marvels of execution. FLAXMAN is also rightly assigned a place in the collection, although, as a religious man, he

would not be flattered by his proximity to ROWLANDSON in the catalogue. BLAKE would have as much right to be shocked, but the recluse of Fountain Court would be more merciful than the sculptor in his judgments. There are seven of BLAKE's drawings of innocence to which no academic rule can be applied.

WILLIAM PAYNE's *Cromer* and all genuine works by him merit respect on account of his efforts to improve the technique of the art. Before his time it was easy to perceive the influence of the aquatint engraver. Colour was only a supplement to line-work, and washes were laid on so thinly they could not be expressive without the aid of more or less pen sketching. The water-colour draughtsman seemed to be akin to the print-colourist. PAYNE attempted to go further by more gradation of colour, deepening his foregrounds, and wiping out or erasing colour to express light by the whiteness of the paper. His use of gum was derived from the print-colourists, but they would not have ventured to bring out effects of sunshine by a sort of glazing of gamboge and lake. W. S. GILPIN, the first president of the old Water-Colour Society, was a genuine lover of landscape, and his *Carnarvon Castle* merits a good position. AUGUSTUS PUGIN was as influential as any of the artists, for he was a pioneer in the representation of the life of his time, and he helped to make people admire Mediæval remains. There are views of Lincoln Cathedral and Oxford by him, but they are not the most trustworthy of his drawings. DAVES, S. HOWITT, J. CRISTALL (whose portrait is still preserved in the Water-Colour Society), and JOHN GLOVER, who was the first artist that emigrated to Australia, are "representative men." GEORGE BARRET, who endeavoured to be classical without being conventional, SAMUEL OWEN, the marine painter, THOMAS BARKER, of Bath, H. EDWARDS, ROBERT HILLS the *animalier*, WILLIAM DANIELL, W. H. PYNE, who preserved many traditions about English art and literature, P. S. MUNN, J. A. ATKINSON, the unfortunate R. R. REINAGLE and Mr. E. THOMAS, the architect, carry on the roll until it meets the name of TURNER.

The unaided productivity of TURNER can never be credited until all his works are brought together, a consummation which, however devoutly to be wished, is never likely to be realised. That so much has been preserved is one of the miracles of life. The Whitworth Institute possesses no less than forty-two drawings, mostly exemplifying his early periods. In many of them his reverence for architecture is visible. The old bridge at Shrewsbury, with its intrados made up of a series of different curves, the buildings on the parapet, which are held together by timber beams, and the new bridge in process of construction with its braced centering, reveal the treatment by an artist who endeavoured to understand whatever he was obliged to represent. The *Interior of the Salisbury Chapter-house* is evidence that TURNER understood the characteristics of styles as well as any MILNER, DALLAWAY or RICKMAN. How admirably THOMAS GIRTIN could represent buildings is proved by his *Durham* and *Tattersall Castle*, and, unlike his more famous companion, he had the courage to suggest that architectural masses were made up by pretty elements, such as stones, bricks and slates. There is one view by JOHN CONSTABLE—*Fearing Church, Kelvedon*—but oil-colours were better suited to his mind and hand. One of J. M. WRIGHT's pretty drawings, so well adapted for the old Annuals, *A Scene from "The Winter's Tale,"* has been obtained.

The view of the Rye House by CLARENDON SMITH exemplifies the skill in drawing which was possessed by the old topographical engravers. By JOHN VARLEY are views of Carisbrooke and Bala, which are useful for students on account of the skill seen in the composition. Sir A. W. CALCOTT was a still stronger master in the arrangement of the parts of a landscape-drawing, but his works have not received the appreciation they deserve. He is judged as the painter of *Raphael and the Fornarina*, and as such he must be condemned. The two drawings in the Whitworth Institute, *A River Scene with Shipping*, and *The Pool below London Bridge*, are good specimens of his style; but an effort should be made to acquire one of his Italian views, or better still would be one of the Dutch scenes. A. E. CHALON was born in Geneva, and it would be well if all claims to him on account of long residence in England were

abandoned, and he was made over to the Swiss or any other country that is not particular about the work of its celebrities. That applauded men of his class were not able to debase English art testifies to its soundness. LUKE CLENNELL was a pupil of BEWICK, and was one of the most skilful woodcutters of his time. He was not satisfied with reproducing other men's drawings. His *Battle of Waterloo* is the most effective representation of the final scene, and the print from it is popular. The drawing of a *Bridge over a Stream, Scotland*, denotes his skill in landscape. CLENNELL collapsed before he reached his fortieth year, and he had not then attained his full strength; still, he is worth a dozen CHALONS. Neither FRANCIS STEVENS nor WILLIAM WESTALL did much to advance landscape art, but JOHN SELL COTMAN was a master who, although amateurs were neglectful of him, found an exceeding great reward in his power to represent nature. The drawings *Dutch Vessels off the Isle of Wight*, *Off Portsmouth*, *Wreckage in a Rough Sea* and *On the River Sarthe* only partially express his competence, and it would be well to obtain some of his views on land and architectural subjects while they can be secured at a moderate price. Another worthy who did not find much favour from patrons was WILLIAM HAVELL. By FREDERICK NASH there are two architectural views. The Institute was fortunate in obtaining four of SAMUEL PROUT'S architectural drawings from the guarantors of the Jubilee Exhibition, and a coast scene by him was purchased last year. There are also five drawings by DAVID COX, whose manly treatment we hope will serve as a corrective to students who show a tendency to the prettiness which is now admired.

WILLIAM SCOTT, who died in 1850, is almost forgotten. His *Severn Valley* is skilful. Four of PETER DE WINT'S graceful drawings of riverside scenes have been secured, and one of the Trinity Chapel in Canterbury Cathedral, by JOHN CONEY, who was one of the ablest of the architectural draughtsmen. WILLIAM MULREADY'S sketches will afford many a lesson to students. He was not always engaged in collecting materials for pictures; up to the end of his life he found a solace in drawing, in the simplest things he found trials of strength, and the veteran was not ashamed to acknowledge how much he had to learn. If rightly used the sketches will be among the most valuable of Mr. TAYLOR'S gifts. There is as yet only one of COPLEY FIELDING'S drawings, *Boats entering Dover Harbour*. G. F. ROBSON, JOHN MARTIN, W. TURNER, G. S. SHEPHERD are also represented. No less than seven of WILLIAM HUNT'S were secured, and fortunately they reveal his genius under its various aspects. A view of Stcke Pogis Church is a memorial of the venerable architect, JOHN CHESSELL BUCKLER, who died a few months ago in his ninety-ninth year. A view of Edinburgh, which was prepared for the illustration of SCOTT'S novels by CLARKSON STANFIELD, and one of his sea-pieces, *The Wreck of the Avenger*, will be welcomed by all who admire the brave artist who fought his way through many difficulties, and remained the genial sailor to the end of his life. His friend DAVID ROBERTS was no less great in dealing with architecture, and he was able to impart a grandiose character to a village church. There are four drawings from his hand, three of them representing the Spanish subjects in which he was most successful. A view of Rotherham Church is by ORLANDO JEWITT, who helped to popularise architecture by his excellent woodcuts. Three of GEORGE CATTERMOLE'S drawings, one of JAMES HOLLAND'S, one of J. B. PYNE'S, two of FREDERICK TAYLER'S and two of GEORGE CHAMBERS'S have been presented by the guarantors of the Jubilee Exhibition.

Manchester does not include many artists among its "men," and therefore importance must be attached to *The Falconer* and the *Edie Ochiltree* by HENRY LIVERSEDGE, who, as the inscription in the Chorlton church records, "cultivated his innate love of painting in defiance of adverse circumstances and a weakly frame. Life was to him a school for the earnest study of his art in the subjects of romance and humour to which his genius inclined. Death overtook him as he passed from scholar into master." One of THOMAS ALLOM'S foreign scenes, *Houses in Adrianople*, *A Spanish Festa* by J. F. LEWIS, *The Gallery at Aston* by JOSEPH NASH, four drawings by WILLIAM MULLER, one by E. J. NIEMANN, two by A. G. VICKERS and one by

BONINGTON complete a collection which, with the aid of the catalogue, will enable students in Manchester to realise why the English school of water-colour art is the admiration of all the world.

DRAUGHTSMANSHIP v. ARCHITECTURE.

By P. MORLEY HORDER.

IF all our buildings were as realistically beautiful as they are represented, this might be a golden age of architecture. Time was when discretion in the choice of materials was less difficult, and the merits of simplicity and proportion in design were not marred by a multitude of ornamental features, devised with no regard to principle. It would be interesting to see the first studies for some of the most perfect of our ancient buildings and compare them with modern ones. One seems to see at once all that is crude in the way of drawing opposed to the greatest refinement of line and delicate shade; and yet one is probably based on the subtlest knowledge of rightly disposed masses, and the other the mere skilful counterpart of something already existent, with no special relation to the particular area of ground it is intended to beautify. One is to satisfy the designer as to the grouping of the different lines of his building; and is more for his own satisfaction; the other is to entice others into a belief in the final beauty of the proposed building. It is, in fact, the difference between the work of an artist who works primarily for the love of his art within the lines of circumstance laid down, and the mere professional employer catering for a public whose ignorance makes his task easy. There is then a serious danger in mere facility of draughtsmanship. Whilst it is a considerable, almost an assured, means of success in these days, it is in no sense the prime qualification of an architect. To the trained eye more certain signs of real beauty may be found in the crudest and yet studied elevation than in the most realistic perspective. If it could be borne in upon the public that beautiful architecture consisted of beautifully-disposed building material (that the only test of an architect's skill was in such actual and effective uses of the materials within his reach), rather than a multitude of useless features and materials, there would be less chance of their being allured by skilful drawings, or imagining that such must necessarily result in beautiful buildings. The subject of competitions has been worn to death; it seems a necessary evil of our time, and the grumbler at the system looks sadly like an incompetent miscreant. The competition race is certainly not as a rule to the instinctive designer, the result hinging almost entirely on the amount of skill shown in the drawings. To be successful you must know exactly the conventional methods considered correct—the result may even turn on the colour of your mounts. It has been urged in favour of these competitions that it gives young men with few chances opportunities of making a start; but I question whether the amount of labour and expense involved in a well-ordered competition is not prohibitive in most cases. Certainly it is hardly worth while a young man entering a large competition where so much turns on the splendour of the drawings presented. The impossibility of any fair adjudication on a series of architectural drawings in these days is quite obvious. The layman with any nice sense of architecture is the rarest exception, certainly in town councils and the like; whilst the introduction of an assessor as a final decisive factor has serious drawbacks from an outside point of view. Naturally a committee feels it knows best its actual requirements in the matter of arrangements, and the best design does not always accompany these. In fact, in the present chaotic state of architecture and the almost complete ignorance and indifference of the public generally about the subject, competition is an anomaly. Did the architectural body set any value on the dignity of its art it would try to organise a crusade against such a system—it would at least discountenance it through its leaders. In fact, if there were any real enthusiasm amongst its members it would create so strong a feeling amongst the Fellows of its body that they would one and all agree to put an end to so pernicious a system by refusing to compete again. Decisive action of this kind would do the profession infinitely more good than harm, and the public would be the first to approve. What is to take the place of the competition? will be asked. Our towns are glorified by their great buildings and their architecture should only be entrusted to those who have competently enriched the land elsewhere with beauty. Of course it will be urged that this leaves small opportunity for the aspirant to architectural honours. And yet there is every reason to suppose that a discerning public, taking so deep an interest in its material surroundings, would in time feel that the excellent quality that goes to produce or make effective buildings requiring the strictest economy of means, deserves larger scope for display. He should be one whose eye has been trained unerringly to make the simplest things proportional and beautiful, though he may know nothing of the Etruscans or their work!

TESSERÆ.

The Nomenclature of Mediæval Styles.

IN this country the predilection for the systematising of styles has been pursued with more assiduity than elsewhere, and one nomenclature has succeeded another with a rapidity that has rendered confusion worse confounded. One of the earliest and best attempts was that of Rickman; he divided our native art into four divisions—Norman, Early English or Lancet, Decorated and Perpendicular. From the last it has been found requisite to separate the Tudor, as a well-defined variety; and the acknowledgment of Saxon has, again, entitled that style to rank with the rest. We have here, therefore, three or four dynastic names, and as many technical ones. Latterly several attempts have been made to improve on this, but generally by getting rid of the dynastic names and substituting for them technical ones, derived either from the window tracery or some subordinate peculiarity which the names assigned always describe briefly, often incorrectly, and after all convey no information. The terms Saxon, Norman, Tudor, Elizabethan and such like, however, maintain their ground, and a far more philosophical course would be to extend these, leaving the technical names merely as descriptive affixes. Thus, English architecture might be divided into Saxon, Norman, Plantagenet, Edwardian, Lancastrian, Tudor and Elizabethan. Jacobean has been applied to the next variety, while that which follows, including the works of Inigo Jones and Wren, might be appropriately distinguished by the name of Stuart. Denominations of this sort admit of subdivisions to any extent. Thus the styles of the first, second or third Edwards are sufficiently distinct to require separate names, though no technical term could point out exactly in what the difference consists. Even the styles of the beginning and end of the long reign of Edward III. require to be distinguished, and can easily be by this form of nomenclature, but can by no other yet proposed. So with the four Georges, or the Stuarts, Lancastrian, Plantagenet, &c. The three Richards, by a singular coincidence, mark three ages of transition. Even without these adventitious advantages, a name so given marks the country and the age without fail, and describes the style with perfect correctness, without even suggesting the necessity of a system. Another mode of attaining the same end has been partially adopted by the French, by giving the date instead of the dynasty; thus they speak of their styles of the twelfth, thirteenth, or fourteenth centuries, and subdivide them into styles of the "first half," "second half," or commencement or middle of each of the centuries; a process as unobjectionable as the one above described, except in the circumlocution it requires, and the desirability of finding a single word if possible to express our meaning. Whichever of these two last systems it may be thought most expedient to adopt, the great desideratum is obtained of a title which shall in the first place express the country where the style was practised and is found, and secondly the age to which it belongs. A third or technical title may be added to characterise it, but this is always unnecessary to any one at all acquainted with the subject, for when the country and age are known, the style is far more clearly suggested than it could be by any technical term drawn from one of its peculiarities.

The Ownership of the Thames.

If Old Father Thames could be interrogated about the ownership of the river he would say that, though occurrences of upwards of a thousand years past were somewhat misty, his recollections were not quite obscured, and he would recall the time when the Romans under Maximus and Theodosius, aided by the tribute of the city of London, then a Roman municipium, embanked the river which divided the two great provinces, Britannia Prima and Flavia Cæsariensis. The government of the port and river remained under the municipal government of the Londoners until the Romans retired from the kingdom, and it was afterwards retained by the citizens as the boundary separating the Angles, who were settled north of the Thames as far as Caithness, and the Saxons who held the country south of the line of the river. During the Heptarchy the Corporation governed the Thames, and Edward the Confessor established courts of conservancy with ample powers secured by charter to the aldermen of London, whose station was recognised even before the kings of England had being. William the Conqueror at his advent exhibited considerable shrewdness in wishing to take possession of the river, but the Corporation evinced so determined an opposition that, desiring to be considered "friendly," as he termed it, he granted a short but comprehensive charter confirming, in general words, all the privileges granted by Edward the Confessor. This charter, very unlike the diplomatic notes, protocols, treaties, &c., of the present day, consisted of only a few lines, but although after an interval of eight hundred years its phraseology might appear somewhat obscure, it was at the time capable of being comprehended by the meanest capacity, and completely to the purpose. Many of the succeeding kings attempted to interfere with the govern-

ment of the river, but invariably met with the same successful rebuffs from the citizens. Favourites and courtiers, then as now the fruitful sources of evil, were equally unsuccessful in enforcing the grants illegally made to them; until at length, in the reign of James I., the citizens actually filed an information against the Crown to establish their rights, and Sir Edward Coke, the attorney-general, confessing the right of the Corporation based upon immemorial usage, judgment was entered up in the Court of Exchequer; but to make assurance doubly sure, the king recognised the right and confirmed it by a charter, which though annulled by *Quo warranto* in the Star Chamber, was confirmed with the other charters granted to the city by William III., whose plain common sense and feeling of justice recognised the evident rights of the Corporation to continue to be the conservators of the river which had been so long in their hands, and had been by them so ably administered.

The Position of Architecture among the Arts.

The function of sculpture is to represent, in solid material, the forms of natural objects or of geometrical combinations. In statuary, in the carved work on friezes and tympana, in the foliage of capitals, we have natural objects, and in mouldings, string-courses, twisted and clustered shafts and the like, we have a mixture of round, angular and elliptical forms. The more closely we adhere to original models the nearer we are to high art. Thus caricature is low art, and Hindoo and other oriental idols are usually works of low art, because they are mere distortions of the original figure of man, which should be shown as nature made it. Thus, too, the carved ornaments of savages are generally of a low character, although the talent and perseverance of the workman may produce individual specimens of great beauty. The further we go from reality the lower we get in the scale; and if we reject models altogether, we have no art left. If this proposition be disputed, let any man take a block of stone and hack it about at his pleasure with a chisel; if he resolves to make something entirely free from any natural or mathematical form, the world, with one consent, will call the result of his labours, not an original shape, but a shapeless mass. With painting it is pretty much the same thing. The ancient Briton who daubed himself all over with woad was not an artist, neither is the house-painter when he covers a whole room with uniform colour. But the South Sea Islander, with his delicate and regular tattooing, is an artist of an humble type, and so is the house-painter when he picks out the cornice with gold and pink, or makes any arrangement in which the aid of form is invoked to give birth to effect. A random dash of colour on a wall is not art; a shapeless rock painted or drawn may be art, but it is so merely because the mind has been exercised to produce on flat canvas an imitation of the rough and jagged thing that is found in nature. Hence sculpture and painting are essentially imitative arts; but the same reasoning does not seem to apply to architecture, or even to music.

Indian Architecture.

The history of Indian architecture commences not earlier than the middle of the third century before Christ, when Asoka made Buddhism the State religion of India, and sought to commemorate the fact, not only by inscriptions, but by monumental columns and other lasting memorials, some of which remain to our day. It then begins with a strong admixture of Grecian, or at least of Western art, as if the Indians were then first learning from foreigners an art they had not previously practised; but this extraneous element soon died out, and is not again to be traced, except perhaps in Cashmere, where it seems to have long remained in force. From the time of Asoka till nearly that of the Mohammedan conquest there exists no difficulty in tracing the whole history of Buddhist art, a complete series of examples existing in the caves and topes which, taken in connection with those of Afghanistan and Ceylon and other buildings, amply suffice to elucidate the subject. From that time to the present day we find abundance of examples in Burmah, Thibet and Nepal, which, with collateral illustrations from Java and elsewhere, enable us to trace the history of the Buddhist style through more than 2,000 years. There is every reason to believe that from the buildings themselves, and from the paintings and sculptures with which they are adorned, the whole history of this important sect may be restored with the utmost distinctness and certainty. In India this style was succeeded by that of the Jains, though this latter seems scarcely to have arisen out of the former, but to be the lineal descendant of some older style whose traces have not yet been detected further back than the ninth or tenth century, though some may probably still exist between India and the western parts of Asia. If the Jaina buildings want the manly vigour and boldness of the Buddhist style, they far surpass it in the elegance both of their combinations and of their details. In these respects the Jaina style surpasses any other style in India, and has had in consequence more influence on the Mohammedan art, and, through it, on the modern Hindoo, than any other, circumstances which would render its study singularly interesting had we the means available for its prosecution. At present,

however, they do not exist, and from the circumstances of none of the great kingdoms of India having ever adopted the Jaina as a State religion, its traces are only discovered in the more remote corners of the country, where they have hitherto generally escaped the notice of travellers. The principal Hindoo style arose in the south among the aboriginal Tamul races, and extends north as far as Ellora. We do not know at what age it first was practised, no example having yet been traced to so early a date even as the fourth or fifth centuries after Christ. When it first appears it seems to have adopted Buddhist forms, or at all events to have arisen out of the same forms from which the Buddhists elaborated their style. Hindoo architecture continues almost unchanged to the present day, except that the Mohammedan influence is sometimes strong in civil buildings, and cases occur in which a strange mania for copying debased European art has crept even into the sanctums of their temples. This, however, is a rare occurrence, and generally speaking it is only in the inferiority of workmanship and design that we trace the influence of age in this class of art. In Cashmere there still exists another style, differing from all these, showing in the first place a people secluded from the rest, perhaps retaining its earliest forms unchanged, or at all events owning different influences and practising a different art from any of the people around. When properly investigated it may throw new and unexpected light on this hitherto obscure subject.

Imitation in Art.

Music is not intended to copy any sounds which we hear in the woods or fields. A Paganini may imitate squalling cats, or a Richardson may mimic the twittering of birds, but these are mere tricks, and it is purely by accident that such tricks have become connected with music. Music would still be music, unchanged and unchangeable, if there were no violins or flutes in existence or possibility; yet cats and canary birds could not be imitated on the French horn or trombone. Dr. Whewell tells us that "music imitates the voices of human emotion and passion by tones taken from a definite scale of sounds," but we should say that the passion and emotion are not imitated, but merely accompanied. The swelling of musical waves is a scientific fact, not a process invented or constructed to reproduce anything known before. It is only from a natural yearning for analogies that we compare it to the expression of human feeling, and it is by a sort of conventional understanding that we call soft music tender, loud and steadily rhythmical passages heroic, minor phrases melancholy and the like.

The History of Architecture.

No branch of architecture can be properly studied when we limit the consideration to the productions of one country or of one epoch. He alone appreciates the full privilege of his art who studies the class rather than the individual. Each country has its illustrations, but the whole world alone contains the full development and all ages its entire history. The history of architecture is not easily appreciable, unless we keep in mind certain grand periods and their dominant types, which, as leading features, distinguish each aspect presented by the monuments of the several epochs. He who expects to be a good architect by knowing the history of all the styles and the phases which it has assumed through each period, will find himself much mistaken when he begins to practise. He may be a good historian and judicious critic, but not necessarily a good artist.

Egyptian Metallurgy.

The steel, whose blue edge the accurate painters of the Egyptian tombs have preserved, is more than three thousand years old. How did they temper copper with tin? How mould and use the metals? How work the mines of Nubia and Sinai and the Red Sea, which extend far under the water? We wander amid these mines to-day and behold the remains of the poor workmen, where the shafts have broken or the excavations fallen, with a new idea of the greatness of that power which offered hecatombs of lives in the building of altars. Or how is it possible that granite and sandstone were alike engraved and polished with a skill far surpassing the workmanship of the finest chisels in France? The obelisk which stands in solitary state in the Place de la Concorde at Paris turned the edge of the best steel, and the date of its erection could scarcely be put upon its pedestal, yet it was crowded with hieroglyphics. Upon many of the monuments of Egypt the letters are 3 inches deep, and the closest observation discloses only the perfectness of the work. The most delicate lines covering hundreds of square feet of the finest polished stone set at defiance all modern art. We learn that they gave bronze blades the elasticity of steel, and, without hardening it, made copper cut stone. Basalt was a plaything to them, and porphyry yielded, like marble, to the delicate yet strong touch of these masters. Vasari, the architect of Cosmo de' Medici, tells us that the duke found the secret of cutting granite in the Egyptian

style. This may be true, but the art is now lost. And whether the sand of Ethiopia or Pelusium polished the surface, whether the chemists hardened the chisels or softened the stone for the engraver, there they stand as triumphs of an art which waited centuries for a name.

Augsburg.

The streets of quaint old Augsburg are the most singular commentary on the modern architecture of Munich. The utter stillness and repose of the mass of buildings, each one of which harmonises with the rest in the commanding look, the absence of all striving after effect, the decided character of every façade, the citizen simplicity of ornament, contrast very strangely with the search for novelty, the mongrel mixture of styles, and the profuse decoration that characterise the capital. In Augsburg every restoration is effected with a view to improving what already exists, instead of grafting something new upon the old stock. Slight changes have been made; a few new houses have been built, several have been restored, and yet there is only one attempt to introduce the new Munich architecture. You may still roam about the winding streets, and gaze on old patrician houses, with their mounting roofs and the series of steps at the angles; you may lose yourself in narrow lanes, and extricate yourself at last by a dive through mysterious passages, propped open by beams; you may admire unaccountable little doors, made of a single plank, and locked with bars and padlocks, though scarcely large enough to admit anything bigger than a rat; you may look up with the most genuine admiration at the noble pile of the towering Rathhaus, and still find nothing to displease you in the old free town of the commercial Middle Ages. Perhaps there is no very real interest in thinking of Charles V. and the Emperor Maximilian when you have none of their works before you; and the admirable cellar of the Drei Mohren is far more worthy of a visit than the room in which Fugger burned the bond that Charles V. had left as a security. But there are people of such eminently historic minds that the least association is of value to them, so long as it can be duly authenticated.

Improvements in Fireplaces.

Among the first who directed attention to the improvement of the domestic hearth, Count Rumford is the best known in this country. The alteration which he made was very simple, but its success had the effect of remodelling all the arrangements of the fireplace, and it has been the parent of the numerous register stoves now seen, which have swept away the goodly chimney corners and wide, open fireplaces of our ancestors. This change was effected by contracting the throat of the flue. Within the large cavity of the chimney opening he formed, as it were, a second fireplace by building a wall in front of the chimney-back, and so much in advance of it that when carried up to the level of the arch at the back of the mantel a space of not more than 4 inches was left for the depth of the throat, from the back of the arch to the face of the new wall. He then contracted the opening over the fire by placing upright covings of brick in each interior angle of the recess. These formed an angle of about 135 degs. with the back of the fire, the distance between the re-entering angles of the covings being in no case greater than the width of the perpendicular part of the flue. By this arrangement the area of the throat of the chimney was reduced to 72 inches, and in many cases made even a third less. To facilitate the sweeping of the flue, the upper part of the back wall was formed with a slab of stone or fire tiles, which could be pushed back to allow a boy to pass into the flue, and replaced. The immediate results of these alterations were the entire prevention of smoky chimneys, increased heat thrown into the apartment, and a degree of general comfort previously unattainable.

Banks the Sculptor and Gothic Art.

It is not known generally that William Mulready was in his early years attracted by architectural subjects. In 1804 he exhibited views of the crypt of Kirkstall Abbey and of the west front of the same building. In 1807 he sent a view of St. Albans to the Academy. He always declared that the first drawings he made on entering Banks's studio were from Gothic sculptures, originals which had been given to Banks by Alderman Boydell, and taken from the porch at Guildhall in 1789, when the place was restored by George Dance. The statues represented Religion, Fortitude, Justice, Temperance, Law and Learning, at least they were so designated in the early part of this century. Mulready felicitated himself and his master on their being among the first persons to appreciate at its value the extraordinary merit of these specimens of Gothic art. So rigid was Banks in demanding due consideration for their beauty that he insisted upon the most unflinching rendering of all their characteristics. At Banks's sale, which took place shortly after his death in 1805, these works were sold for 100*l*.

NOTES AND COMMENTS.

THE Tarsney Bill, which was intended to enable unofficial architects in the United States to design Government buildings, having failed to realise the intention of Congress, a new Bill has been introduced which was prepared by the architects who are desirous to see the existing system changed. It proposes the establishment of a commission consisting of three prominent architects and two officers of engineers. The commissioners are to discharge all the administrative duties relating to the procuring of designs and the appointing of architects for all buildings to be erected by the Government of the United States. The Secretary of the Treasury is to be president, and the supervising architect is to be a member. The members are to be paid their actual expenses and subsistence, with an allowance of ten dollars a day while employed. If a building is to cost 100,000 dols. or more, five architects are to be selected by ballot to take part in the competition; if the building is to cost less, an architect can be selected by ballot without competition. No architect shall be eligible for entering as a competitor or for appointment who has not had at least ten years' experience as an architect in chief, and unless he can satisfy the commission, through work already done by him or otherwise, that he is competent to take charge of the economical construction of the building. Unsuccessful competitors are to be paid in the case of buildings to cost not more than 150,000 dols. the sum of 150 dols., and for every 100,000 dols. above that amount the additional sum of 100 dols., but in no case shall more than 1,000 dols. be paid to any unsuccessful competitor. The successful architect is to be appointed by the Secretary of the Treasury on the recommendation of the commission. He is to fill a complete set of the working drawings in the Treasury Department, from which duplicates are to be made and paid for out of the appropriation for the building. The architect's fees are to be 5 per cent., with the usual travelling expenses. A competent clerk of works is to be employed and paid for out of the appropriation. The supervising architect is to represent the Government, to receive the tenders, and, with the approval of the architect, to award the contracts. He is to perform all other duties pertaining to his office except those vested by the Act in the architect of the building. The clauses seem to be advantageous for architects. As it is generally supposed that in America there is encouragement for the young, the restriction of competitions to architects who have had at least ten years' experience will be a surprise. Some of the best modern buildings in England would not exist if a similar condition prevailed.

THE monument which is to be erected as a memorial of the late M. ALPHAND, the director of the municipal works of Paris, is in progress in the atelier of M. DALOU, the sculptor. It is to be erected in the garden in which stands the noble tower of St. Jacques, in the Rue de Rivoli, which is not only one of the best positions in the city, but is not far from the Hôtel de Ville, where M. ALPHAND so long laboured. The sculptor has arranged the memorial as a hemicycle with a statue in the centre. M. ALPHAND will be represented in everyday dress, holding his hat and umbrella in his left hand. With his right he points to a group of portrait-figures, who will represent Painting, Sculpture, Architecture and Engineering. There will be also figures of workmen. On the hemicycle will be reliefs which will suggest the appearance of Paris before and after the operations which M. ALPHAND planned. The architectural part of the memorial will be designed by M. FORMIGÉ. A monument of the engineer, on which the same artists have co-operated, has been set up in the cemetery of Père-Lachaise.

THE annual report of the Somersetshire Archæological Society states that the Society is progressing satisfactorily, though the number of members is almost stationary, being 550 this year against 558 last year. The balance in hand at the end of 1893 was 49*l.* 1*s.* 2*d.* on the general account, against 89*l.* 17*s.* 6*d.* in 1892, and 103*l.* 4*s.* 4*d.* in 1891. The decrease of funds thus shown is accounted for by the

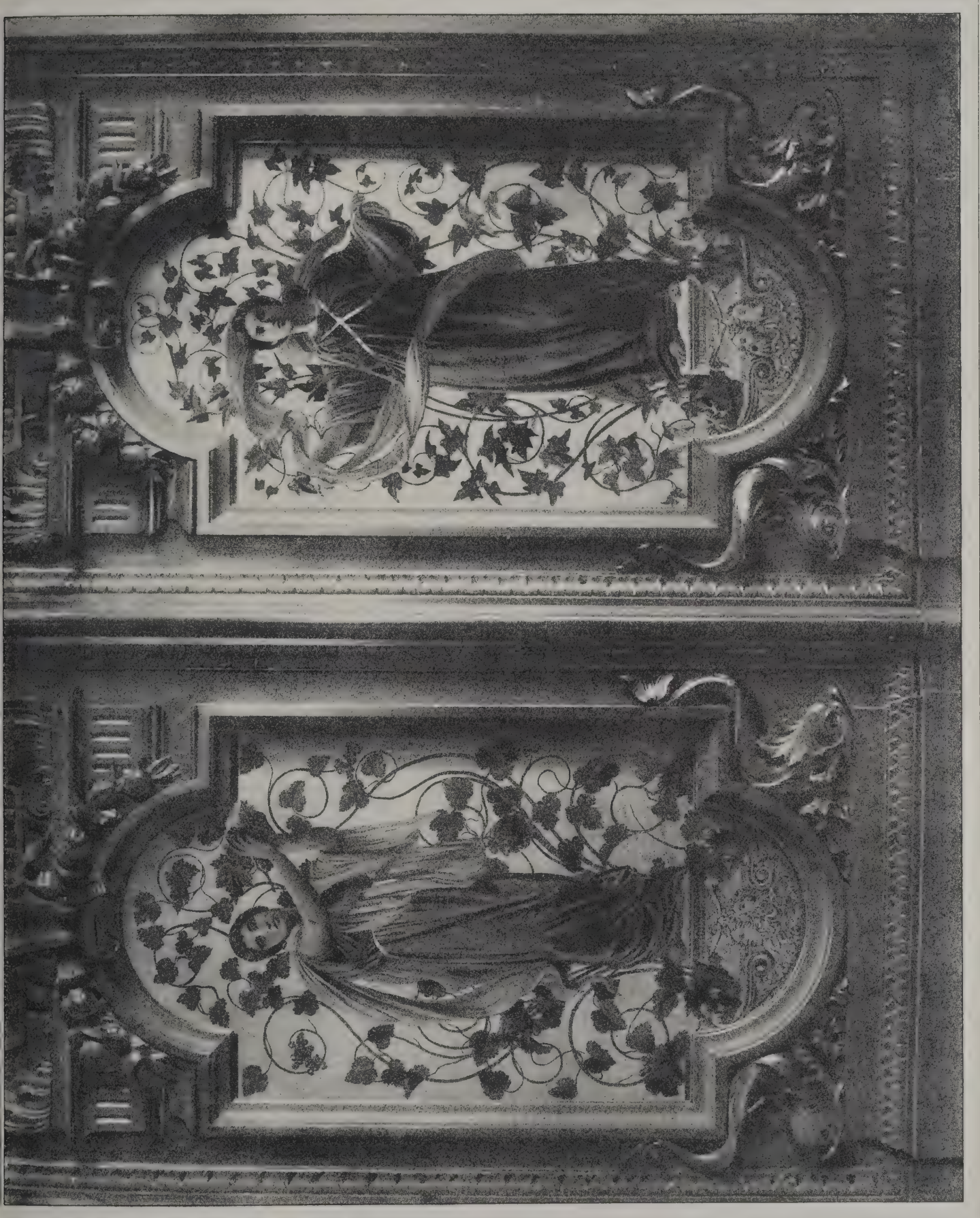
increased bulk of the volume of "Proceedings," by ever-increasing demands in connection with the museum, and in the last year by a special grant of 10*l.* to the Somerset Record Society towards the printing of the "Register of Bishop Ralph of Shrewsbury." On the Castle Purchase Fund, there is a small debt of 6*l.* 2*s.* 5*d.* against 5*l.* 5*s.* 4*d.* last year. The subject of the restoration of the castle buildings was referred to in last year's report. The Council hopes that this important matter will still be borne in mind and that a fund for this purpose will soon be set on foot. The number of visitors to the museum and library during the year 1893 was 5,539 against 5,328 in 1892. Since the last annual meeting the Society have had to share with the county at large in lamenting the removal from amongst them of one of their most valued and accomplished vice-presidents, Lord ARTHUR HERVEY, the bishop of the diocese. The index to "Collinson" is proceeding, and a hope is expressed that it may be published before the meeting of 1895. The county history still awaits the coming editor, and Mr. GREEN'S "Bibliography" needs more subscribers. During the past year have been published Mr. C. W. BARRETT'S "Somersetshire Highways, Byways and Waterways," Mr. E. J. RAWLE'S "Annals of Exmoor Forest," Mr. JOHN BATTEN'S "Historical and Topographical Collections Relating to South Somerset," and Canon CHURCH'S valuable "Chapters in the Early History of the Church of Wells." The latter had come at a most opportune moment, when renewed interest was being stimulated by the recent discoveries in the eastern cloister, and by the fact that the excavated ground had no sooner been replaced than it had to be reopened for the interment of the late Bishop. The Council with great pleasure announce that Lieutenant-Colonel EWING has kindly undertaken the duties of honorary superintendent of the museum and library, and that arrangements have been made for the more rapid compilation of a catalogue of the Society's very valuable collections. Recognising the long and faithful services of the curator, Mr. BIDGOOD, an addition of 20*l.* per annum has been made to his salary. The Right Hon. Lord PORTMAN, to whom the Society is indebted for a large and most important collection of geological specimens, has expressed his readiness to accept the position of vice-president.

It is proposed to erect a memorial of GUSTAVE NADAUD, the song-writer, in Roubaix, and a competition was accordingly arranged. The jury of selection contained a remarkable number of members. Besides the elected of the committee of subscribers, there were MM. PAUL LEFORT and ROGER BALLU, inspectors of fine arts representing the Minister, M. DAILLON the sculptor, M. BILLORÉ, president of the architects of the north of France, M. BILYGVN, Government architect at Lille, M. MAILLARD, architect, and M. HENRI VERLAIS, administrator of the School of Industrial Art at Roubaix. Their choice was the model by M. CHARLES LEFEBVRE, architect, and M. CORDONNIER, sculptor. It ought to be deserving of the distinction after satisfying so many judges. Yet probably all the competitors were not satisfied with the result.

THE old question about making a bill of quantities form a part of the contract arose in the House of Commons on Wednesday *à propos* of the new Liverpool Post Office. It has been announced that the Government will not be responsible for the accuracy of the quantities, and Mr. LAWRENCE was eager to know whether that course, especially in works of considerable magnitude, was not unusual. The First Commissioner of Works in reply said that the advertisement inviting tenders for the new post office at Liverpool notified, as was usual in the case of all new works under the Department, that the Commissioners of Works did not hold themselves responsible for the building quantities. The suggestion in the question was a very serious one. It was now receiving consideration by the technical officers of the Board, and it would be decided as soon as possible. It may be assumed that the decision will be to the effect that the practice of the officers has always been right, and does not differ much from the practice adopted in ordinary contracts.

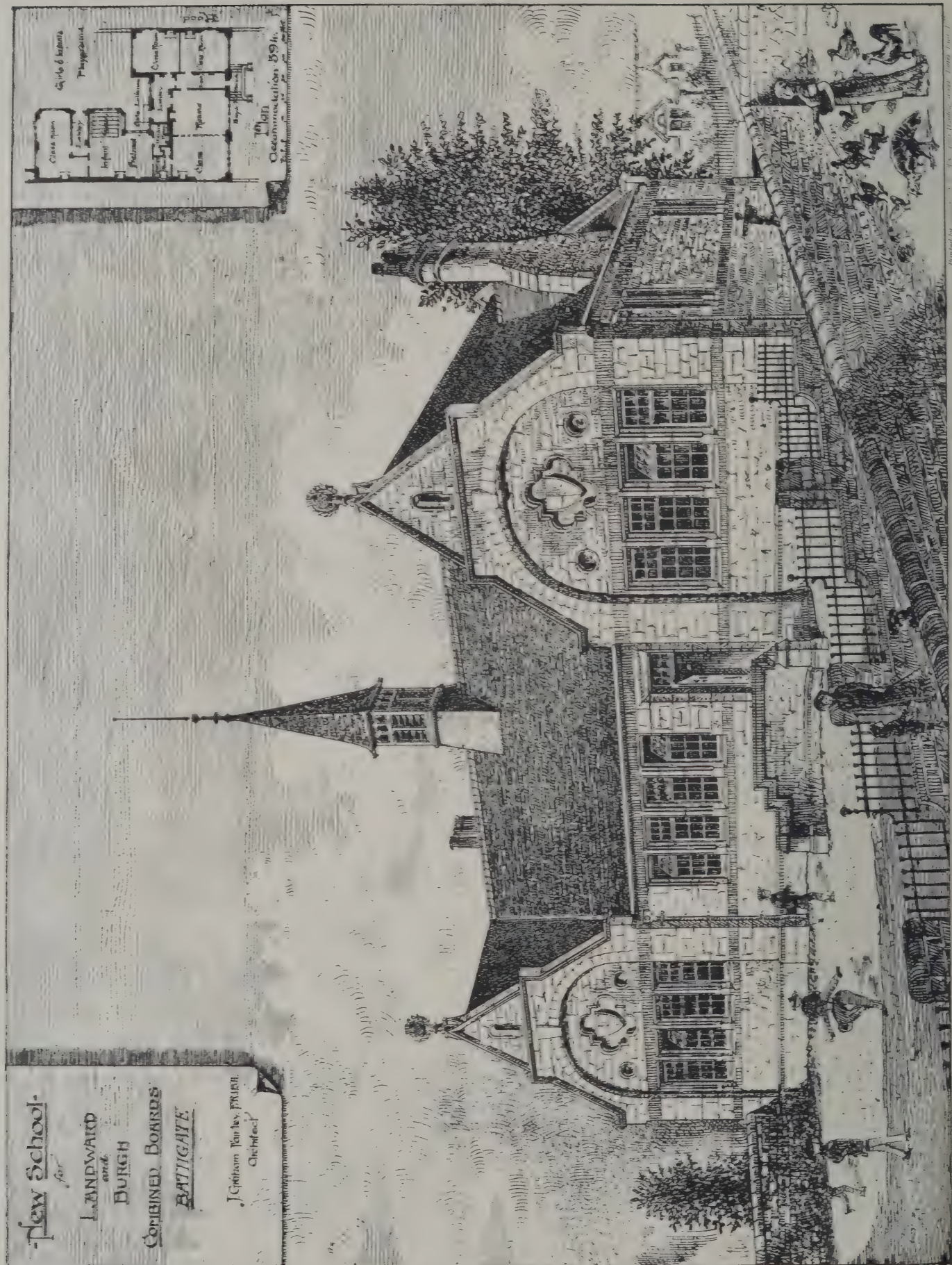
Die Architektur, Aug. 24th 1894.





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DECORATIVE PANELS.

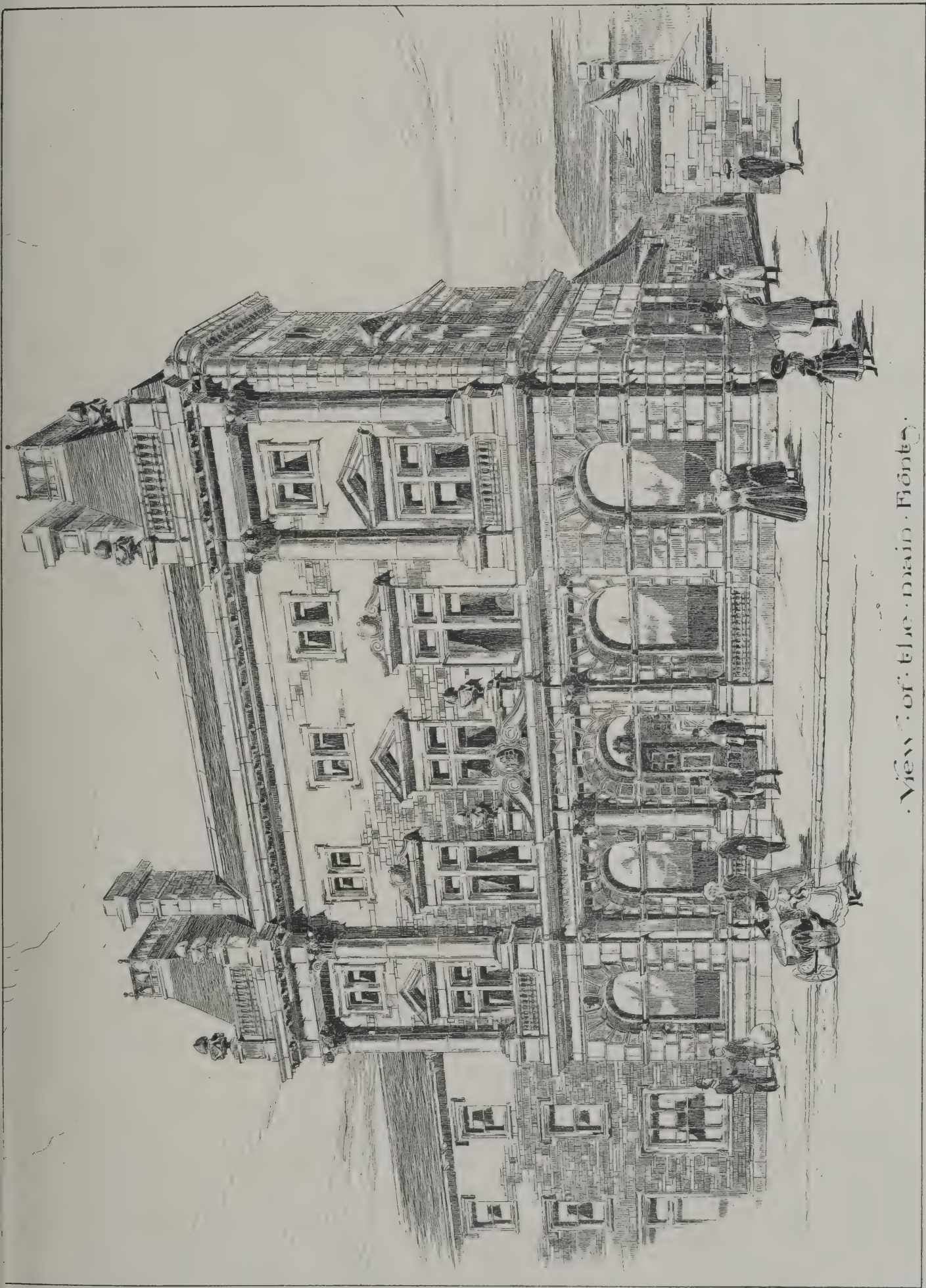


New School
for

LANDWARD
and
BURGH

COMBINED SCHOOLS
BOARDING
BATHGATE

J. Graham For the ARCHT.
Architect



View of the main front.

LONDON AND PROVINCIAL BANK, NEATH.
W. WILSON & GLENDINNING MOXHAM, Architects.

· RESIDENCE · IN · WESTFIELD · RD · EDGBASTON ·

FOR

· P · A · MARTIN · ESQ^{RE} ·

· ESSEX · NICOL · & · GOODMAN · ARCH^{TS} ·

· BIRMINGHAM ·





ILLUSTRATIONS.

DECORATIVE PANELS.

THE four panels in painting and wood-carving represent the four seasons. They are the lower panels of two doors in a large Sala designed and painted by Professor CASARE FORMILLI belonging to one of the best known connoisseurs and patrons of art in Portugal, Signor MANOEL DE CASTRO GUIMAREAS. These figures are on a neutral ground, and correspond in subject with four landscapes, which form the upper panels of the doors. The Spring is draped in green on a background of almond flowers; the Summer in white surrounded by roses; the Autumn in terra-cotta, with grapes in the background; the Winter is draped in yellow bronze on a background of ivy. In later numbers of this Journal will be published some other of the many pictures and sculptures in this Sala, on which large work the artist spent some five years.

The chief characteristics of this work, in addition to a large frieze of life-size figures and large ceiling picture, are the walls of mirrors, painted with flowers and foliage, which make a reciprocal and infinite reflection of one another, and so produce one of the most striking effects imaginable, especially at night when lighted with four large chandeliers which stand out from the pedestals of four statues in the angles of the room. The whole effect is of an illimitable garden in fairyland.

RESIDENCE, WESTFIELD ROAD, EDEBASTON.

THIS residence has recently been erected by Mr. G. H. MARSHALL, builder, of Smethwick, from the designs and under the superintendence of Messrs. ESSEX, NICOL & GOODMAN, architects, of Birmingham, for Mr. P. A. MARTIN. The exterior is faced with picked common red bricks and Bracknell rubber brick dressings, and the roofs are covered with brindled tiles.

LONDON AND PROVINCIAL BANK, NEATH.

THE façade is designed in the Renaissance style, and will be built of Box ground stone entirely. On the ground-floor are the bank chamber, with manager's rooms, clerks' lunch-room, strong-room, muniment-room, lavatories and water-closets. There are also the manager's dining-room, kitchen and offices on this floor.

The first and second floors are planned for the residence of the manager.

The contract has been let to Mr. ABRAM GEORGE, of Neath, and the plans have been prepared by Messrs. WILSON & MOXHAM, architects, of Swansea.

NEW SCHOOL, BATHGATE.

[The wrought-iron staircase balustrade at Wheatfield Court, Headingley, near Leeds, illustrations of which appeared in *The Architect* last week, was executed by Messrs. Jones & Willis, of London and Birmingham.]

SHEFFIELD SOCIETY OF ARCHITECTS.

AT the meeting of the Sheffield School Board, the *Sheffield Independent* says the business was chiefly of a routine character, and the proceedings did not last an hour. In the absence of the chairman Mr. B. Fletcher (vice-chairman) presided, and the other members present were Mrs. Hoskin, the Revs. G. W. Clapham, T. W. Holmes and H. J. Shaw, Messrs. F. P. Rawson, J. Knowles, W. Colver and R. Jackson.

In the minutes of the building committee there appeared the following:—"The committee have considered a letter, signed by Mr. E. M. Gibbs and Mr. C. Hadfield on behalf of the Council of the Sheffield Society of Architects and Surveyors, with reference to the competitive plans for the Tinsley Park Road School, pointing out that in view of the assessor's report and the fact that only three infants' classrooms are shown on the plans marked 'Sangler Rouge,' those plans should have been set aside and the first place awarded to 'Multum in Parvo.' The committee have also considered a protest signed by nine competitors who sent in plans for the proposed school at Tinsley Park Road, but they do not recommend any action thereon."

Mr. Rawson said that the whole point of the matter was that the plans which were selected did not conform to the conditions, as they only provided for three classrooms instead of four, and the other plans did conform. It seemed to him that there was justification for the protest of the architects, and good ground for the Board asking for an explanation.

Mr. Fletcher, as chairman of the building committee, regretted that the architects had felt it necessary to make this protest, because there had not been the smallest desire on the part of any one connected with the Board to do the least unfair thing towards them. Some of the architects to whom he had spoken seemed to be under the impression that the committee had allowed the assessor to select the designs, but that was not so; he had simply given the committee his advice, and they had treated it as the advice of a skilled man. He with confidence asked the Board to confirm the minutes.

The Rev. T. W. Holmes said he did not think anybody would imagine that there was an intention to do injustice to the architects who were competitors, but he thought it must be admitted that they had good ground for complaint when the Board's conditions were that there were to be four classrooms, and when plans had been selected which did not conform to the conditions.

The Rev. H. J. Shaw regretted that this matter should have arisen, but it seemed to him the most natural thing in the world that some misunderstanding should have occurred, seeing that in the conditions some paragraphs said there "must" be certain things, and others said there "should" be. He could conceive that the successful architects might have understood that they had a certain amount of discretion; the fault was in the fact that the conditions were not more explicitly worded. It seemed to him that it would be well in future if they divided their conditions into two sections—those which were imperative and those which were suggestive.

The Rev. G. W. Clapham agreed with Mr. Holmes and Mr. Shaw that their conditions should be more specific; but he intended to vote for the adoption of the minutes.

Mr. Rawson did not think the answer suggested by the committee was sufficiently satisfactory. He felt that one or two of the architects had been placed at a very great disadvantage. It was true that the vagueness of the conditions had led to the difficulty, and the committee had gone away from those architects who had strictly and conscientiously observed the conditions, and given the palm to one who had taken liberties with them. It was an easy way to get out of a difficulty to say that in future the Board must be careful what they were doing, but what about the architects who were now affected?

The Rev. H. J. Shaw thought they could not go back upon their decision without inflicting an injustice on the architect whose plans had been accepted.

Mr. Fletcher said that as chairman of the building committee, and from the position he occupied at that Board meeting, he did not hesitate to express his regret that such a misunderstanding should have happened.

The minutes were then passed.

The following is the correspondence which took place:—

[COPY.]

To the Chairman and Members of the Sheffield School Board.

Gentlemen,—The Council of the Sheffield Society of Architects and Surveyors have had their attention drawn by several competitors to the assessor's report on the designs submitted for the school at Tinsley Park Road, and to the award of the first place to the design "Sangler Rouge."

The service rendered to the School Board by the architects of Sheffield in submitting fourteen sets of designs for the school, at a cost to the profession of considerably more than the commission to be paid for the completed building is, it is hoped, a sufficient reason for the Council of the Sheffield Society of Architects and Surveyors venturing to submit their views to the Sheffield School Board.

The award appears to be based upon one of the concluding paragraphs of the assessor's report rather than upon the preceding fuller criticism.

The assessor brackets together as equal "Sangler Rouge" and "Multum in Parvo," the former for his higher qualities of architectural design, the latter for his more perfect fitness of plan, and states that "on a third ground, viz. that of suitability to site," he prefers the former, although from the detail report the latter appears to be the one he prefers.

The assessor's fuller criticism of design "Sangler Rouge" states that it provides only three infant classrooms (which is contrary to the conditions of the competition), and, after enumerating points in which the plan does not comply with the requirements of the Education Department, states, "but although ranking artistically higher than any other, the defect of plan is serious."

The assessor's fuller criticism of design "Multum in Parvo" states that "the position of the building on the land is well managed, and in fact all the playgrounds will be sunny"; that he "is the only one who has met all the difficulties without any waste or surplusage in plan," and further that "he is also at top in point of economy."

The conditions of the competition state that the buildings are to fulfil the requirements of the Education Department.

The rules to be observed in planning schools, as issued by

that Department, enumerate "convenience of plan, suitable lighting and proper subdivision into classes," as leading essentials, and "the school architect is recommended first to perfect his plan."

The Council of the Sheffield Society of Architects and Surveyors are therefore of opinion that the first place should have been awarded to "Multum in Parvo," and further that the design "Sanglier Rouge" should have been set aside as not having complied with the conditions as to the number of classrooms for infants.—We are, gentlemen, yours respectfully,

(Signed) EDWD. M. GIBBS, President
CHARLES HADFIELD, Vice-president.

Sheffield: July 28, 1894.

School Board Offices, Sheffield: Aug. 17, 1894.

Tinsley Park Road School.

Dear Sir,—I am directed to acknowledge the receipt of a letter signed by yourself and Mr. Hadfield on behalf of the Council of the Sheffield Society of Architects and Surveyors, and dated July 28, 1894. The Board regret to find that objection has been taken to their decision upon the recent competition, but I am to point out that your Council has evidently laboured under the mistake of supposing that an assessor was appointed, whereas the Board simply asked for advice, and reserved to themselves the full power of determining which, if any, plan should be adopted. They made their selection in perfectly good faith after very careful consideration, and they cannot alter their decision.—Yours faithfully,

(Signed) JOHN F. MOSS, Clerk.

E. M. Gibbs, Esq., 15 St. James's Row, Sheffield.

Mr. John F. Moss, Clerk to the Sheffield School Board.

15 St. James's Row, Sheffield: August 21, 1894.

Tinsley Park Board School Competition.

Dear Sir,—I have to acknowledge the receipt of your letter of August 17, 1894. The Council of the Sheffield Society of Architects and Surveyors request you to assure your Board that they never doubted but that the selection of the designs was made in perfectly good faith.

The Council have, however, to notice that your letter of August 17 does not reply to the main points of contention of the letter of July 28, and as your letter has been published, the Council have thought it desirable to send copies of the whole correspondence to the professional papers.—Yours truly,

(Signed) EDWD. M. GIBBS,

President of the Sheffield Society of Architects and Surveyors.

QUANTITY SURVEYING.*

LITTLE is known of the exact date at which quantities made their prominent appearance. I say prominent, for it is obvious that from the time when contracting was first introduced in building operations, before an opinion could have been formed as to the price to be agreed upon in any contract, some calculation must of necessity be made, and we are about to consider how that prominence originated; also as to the custom existing now, how such calculations are best done, and whose work it is to do them. The necessity for quantities being supplied to contractors tendering is fairly argued in the fact of their universal adoption. Their utility in England is recognised from H.M. Board of Works downwards, and the surveyors who supply them have for their benefit and protection an established Institute of which most surveyors of standing are members. There is an examination to pass before a member is admitted; in addition to which candidates have to be proposed and seconded by six Fellows, the applications being afterwards considered by the council and then voted on by a general meeting; consequently membership is recognised as a guarantee of respectability in many ways. Another great argument in their favour which materially affects those most concerned, but particularly the architect, is the fact that a set of drawings passing through the hands of a competent surveyor have that scrutiny which it is impossible for them to get otherwise; any weak places are almost sure to be detected, and as this occurs before a contract is entered into with the builder, it gives an opportunity to amend, revise, &c., if required, avoiding complications and much unpleasantness with the architect, as he naturally fears he will be considered to have exercised but a very limited amount of care in the execution of his work; with the client, who considers he is called upon to pay unreasonably; and with the contractor, for doing the work he must—such discrepancies being generally connected with structural matters—but often lands him in a position to either make no charge whatever or choose between that and litigation. Just one other reason whilst we are considering this part of the subject—without intending any reflection on that body for one moment—it can safely be urged that no contractor, whatever his ability,

whatever his perspicacity, whatever his judgment, could arrive quickly at a price, in all cases accurate enough for him to undertake to carry out the works without loss to himself; no man is equal to that task, and yet this would have to be done to keep pace with the enormous number of works he must necessarily tender for unsuccessfully. Even his best work must naturally be rough and approximate; he has other duties than simply tendering for work; consequently, he can only devote a very few hours to each work for which he tenders—unsatisfactory to him, I say, for he is working all through the job in the dark; unsatisfactory to the client, as he may be paying for much more than he gets; unsatisfactory to the architect, as his gratuitous care, trouble and anxiety in the case of a contractor who is beginning to discover he is getting too little for his job is beyond conception, for it may lead to any extreme. It is quite true the builder may if he chooses employ and pay someone to do this work for him, but is it not better for him to be free from any expense and responsibility whatever, for surely the proper person to pay for such work is the employer, and as has been seen by doing so places himself in a much more satisfactory and definite position? The old system has the merit of excitement to those who feed upon that element, and it sometimes turns up comfortably; for the contractor unfortunately sometimes not, so he can never make much certainty of what he is about in this matter. With accurate and guaranteed figures to guide him, supplied free of charge, he may even order his stuff, bricks, &c., from such figures. The writer knows several who actually do this. It has often been observed that the quantity surveyor's commission is that amount more than the client would otherwise pay. If we take into consideration the proportion that amount bears to the full cost of the works, we shall see at once that even should this be the case it is cheap at the price, for reasons just before referred to, and any reasonable person will acknowledge it to be so.

The usual commission in London is $1\frac{1}{2}$ or $1\frac{1}{4}$ per cent. for all works of any considerable size. The percentage is much larger in various country districts, and even in large towns, Manchester, Birmingham and Leeds, for instance, but then the works average smaller in size, and the architect not infrequently supplies the quantities himself, a practice considered by many a most reprehensible one; but this is often done probably for the same reason that one sees in this country, "architect, watchmaker, tobacconist and hairdresser," an insufficiency of the one line to support a living. Be this as it may, the case of an architect supplying his own quantities has been fully discussed at the meetings of the Royal Institute of British Architects and elsewhere, with the generally understood result that no architect of any pretensions as an architect should adopt this proceeding.

We have seen that figures of quantity upon which to arrive at an approximate cost of a given work had to be prepared. These were, probably, in the dark days accomplished by the contractor himself, but as time wore on and architectural design became more complex and elaborate, considerable speculation could have been exercised as to the probable cost of work at this period, based upon the old system. This, therefore, gave birth to a more searching and accurate method, and which introduced to the old countries that painstaking, hardworking man of figures, the quantity surveyor. Although many instances have occurred in and outside the Law Courts themselves as to the exact position this gentleman occupies, and many and varied are the opinions, legal and otherwise, expressed of late years, he has maintained a place unquestioned by those intimately connected with building operations, if not altogether by those outside that community. Certain it also is that his work involves the greatest care and knowledge of everything appertaining to building operations, and, to use the words contained in a paper recently read at a meeting of the London Institute of Builders:—

"He must virtually be a man of considerable grasp of mind, great quickness of perception, possess a tenacious memory, great order of thought and power of organisation and concentration, and be a man of decision. These natural gifts must be dominated by a rigid integrity. These qualifications are not of my own imagining, but those possessed by surveyors I know."

We now come to the question who should be the loser in case of any inaccuracy in the quantities? This is a very sore point with many. A few lines quoted from the President's address (R.I.B.A.) November 8, 1890, touching this question may be interesting here. He says:—

"The most rational professional and equitable way is for the surveyor to hold himself responsible for the accuracy of his quantities to both client and contractor."

If he exercises great skill and care an error of any magnitude is impossible, if a rough check is made after the "bill" reaches the draft stage. This is adopted by many known to the author and with gratifying results. Why then should a surveyor have any reluctance to guarantee his figures? Unless he be a very careless, inexperienced, slipshod person, he

* A paper read by Mr. M. C. Day before the Institute of Architects of New South Wales, and published in the *Australasian Builder*.

should be able to place sufficient confidence in his work to do this, and of the many callings in life, excepting, perhaps, medicine, this of all others has no room for such a person. Why should the unfortunate contractor be expected to name, and be bound by, a price the amount of which is based solely upon certain quantities of work which are supplied him? If he supplies his own, naturally he would suffer if he makes a mistake; but if the figures be supplied him by an experienced person, whose occupation is to make such calculations, how can it be considered reasonable that the contractor must suffer in this case? Is it not much better that he should be released from any such trouble and responsibility, the surveyor taking any risks in connection with his own work?

We will now glance at the legal aspect. The view taken by the English Court, even as recently as 1882, seems to be somewhat uncertain, for in the case *Evans v. Carle*, Lord Coleridge remarked:—"It is quite monstrous that the employer should pay for the quantities, that is, that he should pay for what it is the duty of the architect to do."

So that the learned judge evidently considered the preparing of quantities embodied in the duties of the architect, and that the employment of a surveyor was altogether improper, which shows, even in high circles, the great misconception of the question which then existed, arguing that it would be proper to apply in the matter of human repairs to a chemist because he sells physic. The architect usually issues the quantities, but the surveyor prepares them. Fortunately, later cases have considerably cleared the matter up beyond all question. Let us refer to *North v. Bissett* (Law Reports 1 Q.B. 1892, p. 333). In the course of his judgment Mr. Justice Mathew observed:—

"What is the usage which, upon these facts, it is sought to set up? It is one which I should have thought to be notorious—a usage that the fees of the quantity surveyor are paid by the builder whose tender has been accepted. This is a sensible and convenient usage. It brings all the people together, the builder, the client and the surveyor, and they all assent to it."

On the same occasion Mr. Justice Smith also says:—"This kind of tripartite agreement is a sensible and convenient one."

These gentlemen are spoken of as two of the ablest and most shrewd judges on the Bench, noted alike for their commercial knowledge and common sense. Upon this occasion reference was made to a decision given in a Court of Appeal in connection with the well-known case *Priestly v. Stone* in 1888, remarking—although Lord Justice Lindley said, "There was no privity of contract between the two parties" (action by builder against a quantity surveyor for damages caused by negligence in preparing an inaccurate bill of quantities):—"I am convinced that the Court of Appeal in *Priestly v. Stone* never meant to say that the usage was a bad one," said Mr. Justice Mathew, and Mr. Justice Smith remarked similarly. There is another peculiar case touching the question, and which should be referred to since it affects another feature of it. In this case the contractors, having become bankrupt, their trustees sued the client for balance of contract; included in this balance was an amount for surveyor's commission. The client had previously assumed his right to deal with the surveyor directly, which he did, and discharged his account without reference to the contractor, a course in which he was supported by the court, Mr. Justice Grantham, who heard the case, freely assenting. This case is hereby referred to to show that in these days the quantity surveyor has a recognised legal status in building transactions. It shows, and unmistakably, that privity is now taken to exist between the parties, and that this fact is fully understood. This is a great advance. In reference to court cases affecting quantity surveying, we have them as far back as 1837, the notorious *Moore v. the Guardians of the Witney Union* case having been heard in that year.

We now come to the question of the practical application of quantities. If the question be asked, should quantities be made a portion of the contract, many architects will at once exclaim "No." Others will say just as emphatically "Yes." We have seen that preparing bills of quantities by a professional person is the rule; also, that that person and his work are fully recognised in the English courts; the question as to the practical adoption naturally follows, although there will in all probability be many following an adverse course when another is fully received as the popular one by others, arising probably from differences of personal opinion, still we are all anxious to avoid any reputation for eccentricity, and work in the common groove. At the same time, we feel called upon to satisfy ourselves that we in our professional capacity are not playing the part of an automaton. It is the practice in some prominent offices in England to first prepare contract drawings; these are handed over to the firm's surveyor, a gentleman constantly employed by them in their own offices, at a fixed salary usually, who prepares (provided with a list of any special or unusual features which are intended to be embodied in the design) quantities of what he has before him. This work completed, the specification is next prepared, and the whole thing then ready for tendering. Tendering proceeds by con-

tractors forwarding a price based solely upon the quantities as to quantity and description. In some instances a tenderer may call at the architect's office and make an inspection of the drawings and specification; but this is far from customary, unless something very much out of the common is intended. His tender is opened in the presence of all other tenderers, each taking a list as the totals are read out. One is subsequently accepted and tenderers apprised of the decision by advertisement or private communication, and the contract is then entered into. Before a contract, however, is actually signed the contractor fills up a duplicate copy of the bill, which is handed to the architect at the time of signing, and which is intended to act as a schedule of prices for any addition, omission or deviation which may be deemed desirable, provided of course that in the event of the contractor not being informed of such addition, omission or deviation in sufficient time to prevent him sustaining any pecuniary loss, a similar allowance is as usual made. In this case the quantities are taken to be the amount of work, neither more nor less being expected to be done by the contractor who signs the contract, the contract being made accordingly, very much the same in principle to a grocer or other tradesman supplying goods of certain quantities and description referred to in a list provided by the purchaser, only on a much larger scale, a sum total being paid for the whole, any deduction or omission or deviation of course affecting the said total. Here we have perhaps the introduction of quantities in the simplest and most straightforward manner, and there can be absolutely no doubt whatever as to what is or what is not contained in the contract, a feature by no means an insignificant one. The architect's account in this case is of course the greater by the $1\frac{1}{4}$ per cent. addition for preparing and supplying quantities. It will be seen that the architect's proceeding in having a gentleman and staff in his direct employ exclusively for this work, is a question of his own business arrangements and individual opinion. It is certain he cannot claim such additional percentage without himself incurring much more extra cost and responsibility, for he must keep a reliable person to take off, who in his turn has several assistants, and in most instances a separate part of the offices. So that it practically amounts to his keeping a separate staff, doing more work, and consequently receiving more pay. One circumstance alone in many cases would affect the adoption of this course, the one already referred to. Is not the work distinctly apart from the recognised duties of the architect? Is not this the work and responsibility of altogether another profession? The feature in the arrangement of the architect supplying quantities prepared directly by him in this way by no means affects the principal merits of this method, it being apparent that an independent person could supply them equally well for the position they occupy here. It is referred to as it is actually the proceeding known to be adopted in offices where quantities are made the basis of the contract. Another method followed by other architects and a course much more practical than the former is that, drawings and specifications having been prepared, approved of and completed, they are handed over to a quantity surveyor, well known and respected by all concerned—excepting perhaps the client himself—who commences his part of the work, and finally, after, perhaps, a consultation or two with the architect, completes and issues the bills himself, or, after competition, hands them over with the drawings and specification to the architect. These quantities are guaranteed by the surveyor, and are taken to be a fair and equitable quantity and description of the work to be done, as shown by the drawings and specification, and there is rarely any trouble arising in connection with the whole transaction; but the quantities are not taken to be a portion of the contract, nor are they referred to in any way whatever in that document. This method works smoothly enough except in isolated cases in which, perhaps, no other conceivable arrangement could have made a complete success. The question seems a perfectly simple one, with an equally simple answer. Why seek to introduce any other arrangement when this works so smoothly? Why interfere at all with a principle which has become time-honoured and is found to work so well? The practice in Scotland is to estimate and tender from bills of quantities and measure up afterwards, the contractor being paid for the work actually carried out.

We have now sifted our subject roughly. It is quite true much more might be added, but we have, I venture to think, seen:—1. The origin of quantities, and the necessity for their introduction. 2. An analysis of the duties appertaining to quantity surveying, the surveyor himself taking out his quantities, as it were. 3. The legal bearing with reference to a few cases of modern date relating closely to our subject, quoting expressions of opinions from some of the most distinguished judges on the English Bench, and having concluded with a description of how this branch of the profession is practically employed in architectural practice in England, giving the two methods most general there. This we may term is dealing with the theory of the subject.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Continued from page 108.)

IN the third and last place, we will consider architectural propriety with reference to domestic and civil architecture. Most of the mansions erected at the present day in the Italian or Pointed architecture are either burlesques or false application of both these styles. In the first place, what does an Italian house do in England? Is there any similarity between our climate and that of Italy? Not the least. Now I will maintain and prove that climate has always had a large share in the formation of domestic architecture, and the Italian is a good illustration of the truth of this remark. The apertures are small; long colonnades for shade, and the whole building calculated for retreat and protection from heat; the roofs are flat in pitch, from the absence of heavy snow; and plan and outline are both suited to the climate to which the architecture belongs. But we demand in England the very reverse of all this for comfort. We cannot fortunately import the climate of a country with its architecture, or else we should have the strangest possible combination of temperature and weather, and within the narrow compass of the Regent's Park the burning heat of Hindustan, the freezing temperature of a Swiss mountain, the intolerable warmth of an Italian summer, with occasional spots of our native temperature. I wonder if these ideas ever occur to those who design Italian gardens on the moorlands of England. Truly it will not be a matter of surprise if some searcher after novelty try to cultivate a jungle for imitation tiger-hunting on some old English estate.

Another objection to Italian architecture is this: we are not Italians, we are Englishmen. God in his wisdom has im-

England is rapidly losing its venerable garb; all places are becoming alike; every good old gabled inn is turned into an ugly hotel with a stuccoed portico, and a vulgar coffee-room lined with staring paper, with imitation scagliola columns, composition glass frames, an obsequious cheat of a waiter, and twenty per cent. added to the bill on the score of the modern and elegant arrangements. Our good old St. Martin's, St. John's, St. Peter's and St. Mary's Streets are becoming Bellevue Places, Adelaide Rows, Apollo Terraces, Regent Squares and Royal Circuses. Factory chimneys disfigure our most beautiful vales; Government preaching-houses, called churches, start up, at the cost of a few hundreds each, by the side of Zion chapels, Bethel meetings, New Connexions, and Socialist halls. Timbered fronts of curious and ingenious design are swept away before the resistless torrent of Roman-cement men, who buy their ornaments by the yard and their capitals by the ton. Every linen-draper's shop apes to be something after the palace of the Cæsars; the mock stone columns are fixed over a front of plate glass to exhibit the astonishing bargains, while low-ticketed goods are hung out over the trophies of war (see woodcut). But this is not all; every paltry town has a cigar divan, with something stuck out to look Turkish, and not unfrequently a back parlour travestied into a vile burlesque of Eastern architecture. In short, national feelings and national architecture are at so low an ebb, that it becomes an absolute duty in every Englishman to attempt their revival. Our ancient architecture can alone furnish us with the means of doing this successfully; but unfortunately those



A Cæsar's Drapery Shop.



A Castellated Mansion.

planted a love of nation and country in every man, and we should always cultivate the feeling; we ought to view the habits and manners of other nations without prejudice, derive improvement from all we observe admirable, but we should never forget our own land. Such is, indeed, the extraordinary amalgamation of architecture, style and manners now in progress, that were it not for the works of nature which cannot be destroyed, and the glorious works of Christian antiquity which have not yet been destroyed, Europe would soon present such sameness as to cease to be interesting. Already a sort of bastard Greek, a nondescript modern style, has ravaged many of the most interesting cities of Europe, replacing the original national buildings with unmeaning lines of plaster fronts, without form, without colour, without interest. How many glorious churches have been destroyed within the last few years (*pour faire une place*) for the occasional exercise of the national guard!—where a few stunted trees and a puddle of water in a stone basin, which spouts up occasionally some few feet in height, is all we have to see in exchange for some of the most interesting memorials of ancient piety

who profess to admire Pointed architecture, and who strive to imitate it, produce more ridiculous results than those who fly to foreign aid. What can be more absurd than houses built in what is termed the castellated style? Castellated architecture originated in the wants consequent on a certain state of society; of course the necessity of great strength, and the means of defence suited to the military tactics of the day, dictated to the builders of ancient castles the most appropriate style for their construction. Viewed as historical monuments they are of surprising interest, but as models for our imitation they are worse than useless. What absurdities, what anomalies, what utter contradictions do not the builders of modern castles perpetrate! How many portcullises which will not lower down, and drawbridges which will not draw up! how many loopholes in turrets so small that the most diminutive sweep could not ascend them! On one side of the house machicolated parapets, embrasures, bastions and all the show of strong defence, and round the corner of the building a conservatory leading to the principal rooms, through which a whole company of horsemen might penetrate at one smash into the very heart

of the mansion—for who would hammer against nailed portals when he could kick his way through the greenhouse? In buildings of this sort, so far from the turrets being erected for any particular purpose, it is difficult to assign any destination to them after they are erected, and those which are not made into chimneys seldom get other occupants than the rooks. But the exterior is not the least inconsistent portion of the edifice, for we find guard-rooms without either weapons or guards; sally-ports, out of which nobody passes but the servants, and where a military man never did go out; donjon keeps, which are nothing but drawing-rooms, boudoirs and elegant apartments; watch-towers, where the housemaids sleep, and a bastion in which the butler cleans his plate—all is a mere mask, and the whole building an ill-conceived lie (see woodcut).

We will now turn to those mansions erected in what is termed the abbey style, which are not more consistent than the buildings I have just described. To this class Fonthill belonged, now a heap of ruins, and modern ruins too, of mere brick and plaster. In such a house something of an ecclesiastical exterior had been obtained at an enormous expense, and a casual passer-by might have supposed from some distance that the place really belonged to some religious community; but on a nearer approach the illusion is soon dissipated, and the building, which had been raised somewhat in the guise of the solemn architecture of religion and antiquity, discovers itself to be a mere toy, built to suit the caprice of a wealthy

building, and presenting a standing illustration of good old English hospitality; while the venerable parish church in the immediate vicinity, with its grey spire and family chantry, showed that the care spiritual was not neglected by our ancestors in the erection of their temporal dwellings (see woodcut).

Every person should be lodged as becomes his station and dignity, for in this there is nothing contrary to, but in accordance with, the Catholic principle; but the mansions erected by our ancestors were not the passing whim of a moment, or mere show-places raised at such an extravagant cost as impoverished some generations of heirs to the estates, but solid, dignified and Christian structures, built with due regard to the general prosperity of the family; and the almost constant residence of the ancient gentry on their estates rendered it indispensable for them to have mansions where they might exercise the rites of hospitality to their fullest extent. They did not confine their guests, as at present, to a few fashionables who condescend to pass away a few days occasionally in a country house; but under the oaken rafters of their capacious halls the lords of the manor used to assemble all their friends and tenants at those successive periods when the Church bids all her children rejoice, while humbler guests partook of their share of bounty dealt to them by the hand of the almoner beneath the groined entrance of the gate-house. Catholic England was merry England, at least for the humbler classes; and the architecture was in keeping with the faith and manners of the times, at once strong and hospitable. There is a great reviving taste



Old English Mansion, &c.

individual, and devoted to luxury. The seemingly abbey-gate turns out a modern hall, with liveried footmen in lieu of a conventual porter; the apparent church nave is only a vestibule; the tower, a lantern staircase; the transepts are drawing-rooms; the cloisters, a furnished passage; the oratory, a lady's boudoir; the chapter-house, a dining-room; the kitchens alone are real, everything else is a deception. Articles of fashionable luxury, glasses in profusion, couches and ottomans, fill the chambers of the mock convent, from whence a prayer never ascends, or into which a religious man never enters; all, in fine, is a mockery and thing of fashion, transient and perishable as the life of its possessor, and if the structure be substantial enough to last his time, it soon after becomes the subject of some auctioneer's puff; its walls are covered with placards, brokers divide the movables, the whole falls to decay, and is soon only mentioned as a splendid folly.

The old English Catholic mansions were the very reverse of those I have been describing; they were substantial, appropriate edifices, suited by their scale and arrangement for the purposes of habitation. Each part of these buildings indicated its particular destination—the turreted gate-house and porter's lodging, the entrance porch, the high-crested roof and louvred hall, with its capacious chimney, the guest chambers, the vast kitchens and offices, all formed distinct and beautiful features, not masked or concealed under one monotonous front, but by their variety in form and outline increasing the effect of the

for ancient domestic architecture, but a vast many pretended admirers of old English beauties, instead of imitating the Tudor period, when domestic architecture was carried to a high state of perfection, stop short at the reign of Elizabeth, the very worst kind of English architecture; and, strange to say, these unmeaning conglomerations of debased forms have been classed into a regular style, and called after the female tyrant during whose reign they were executed. The only reason I can assign for the fashionable rage for this architecture (if so it may be called) is that its character is so corrupt, mixed and bad that the anachronisms and anomalies so frequently perpetrated by modern architects are made to pass muster under the general term of Elizabethan; and certainly I cannot deny that the appellation is very appropriate when applied to corrupted design and decayed taste.

(To be concluded.)

It is stated in the prospectus of the Glasgow School of Art for the coming session that the ordinary advanced work in life and painting has been revised and made as complete as possible. The work of the technical studios has been improved, and new appointments of skilled instructors made. The architectural section has as a leading feature a series of lectures on Mediæval architecture, to be delivered by Mr. Alex. M'Gibbon, A.R.I.B.A.

MONT ST. MICHEL.

FROM the elm-shaded terraces of Avranches, says a correspondent of the *Glasgow Herald*, the eye wanders with delight over one of the most beautiful landscapes that northern France affords. For miles around the valley watered by the Sée and the Sélune spreads out in an ocean of ever-varying verdure—now light, now dark, as the sunshine falls on an expanse of fertile plain, or on the luxurious foliage of the trees scattered about in thick clumps. Away in the background the yellowish sands mark out the sinuous boundary of a gulf which extends, crescent-shaped, from Granville in the north to Pontorson in the south. This is the “blue, savage Norman bay.” In the midst of it there rises on its steep-peaked rock, like an enchanted castle, that splendid and imposing structure to which the admiration of the Middle Ages gave the name of the Wonder of the West, the historic pile of Mont St. Michel. Thus seen at a distance, veiled by the mist and surrounded by sand and sea, it seems to be rather a colossal menhir than the work of human hands.

According to the tradition of the district, the Couësnon, which here serves as a limit between Normandy and Brittany, once flowed to the east of the Mount, whereas at present its sandy bed is a few yards to the west. Hence the popular Breton rhyme:—

Le Couësnon, dans sa folie
A mis le Mont en Normandie.

To this the Normans, strong in possession, arrogantly reply:—

Si bonne n'était Normandie
Saint Michel ne s'y serait mis.

But in spite of St. Michael and the Couësnon, the Mount stands in a landscape, of which the weird grandeur is characteristic of the former rather than the present possessor.

In Celtic times, however, St. Michael's Bay was very different from what we see it now. A dense forest covered the greater part of the immense waste of sand which forms a kind of debatable territory between land and sea, and over which at each flood the waves rush in to assert their sway. At its extremity there stood a huge pyramid of granite, of which the Druids had taken possession, and which they had consecrated to the worship of the sun-god. From him it took the name of Tom Belen, changed at a later period into Mons Tumba or Tumulus Beleni by the Roman invaders. A cavern within the rock was used as a Neimheidh or ancestral sanctuary, and it was from its gloomy depths that the attendant priestesses delivered their oracles. For their mystic and nocturnal rights, however, they abandoned the mainland and betook themselves to the rocky islet, to which the pagan name of the Druidical sanctuary was transferred when Christianity took possession of it and which is still known as Tombelène. The religious awe which it inspired has found an echo in the legends which have clung to it through centuries. In the Middle Ages the minstrels sang how the niece of a King of Brittany had been kept there by a giant and had died of her great grief. Later the peasants of the neighbouring coast related that a young girl of the name of Helen, not having been able to accompany her lover to England in the train of William the Conqueror, took her station on the rock to watch the receding ship which was bearing him away and never returned to the mainland. But nowadays the uncultured fisher-folk do not allow their imagination such wide scope. Their historical horizon is the French Revolution, and they have transformed Helen into the daughter of a general, during whose absence she was carried off by a sailor, and brought to live and die, and be buried on the islet.

Long after Druidism had disappeared from the land, and when the chiefs known in history as the Merovingian kings ruled over a part of what is now France, about the beginning of the eighth century, Aubert, a holy man, born of a noble family not far from Mons Tumba, was Bishop of Avranches. At that time the forest of Scissy still extended to Mons Tumba, and it was the bishop's frequent custom to betake himself to the solitary craig, and to spend whole days in prayer and meditation in the cavern which had once been a heathen sanctuary. One stormy night, when the moaning of the forest and the roaring of the waves were re-echoed in weird sounds within his lonely retreat, Aubert saw a glorious vision. He beheld an angel, clad in brilliant armour and with a golden helmet on his head, standing on the rock. With the point of the glittering sword which he bore in his right hand the heavenly messenger touched the summit of the cliff and sent it crashing into the sea. On the foundation of rock that was left there suddenly arose a lofty church filled with armed warriors, above whom hovering angels sang a marvellous melody. On awakening from his dream Aubert was greatly exercised in mind to understand what it might mean. For three whole days he fasted and prayed that it might be given him to interpret the message aright, and at the end of that time the same figure appeared before him a second time, and bade him erect a church which should

be dedicated to him. With his flaming sword the angel pointed to a passage in the book of the Scriptures which lay open on a ledge of the rock, and Aubert, turning to it, read, “And there was war in Heaven: Michael and his angels fought against the dragon: and the dragon fought, and his angels.” Still Aubert's doubts and hesitations were not dispelled, and he knew not whether his visions were messages from God or snares set for him by the spirit of evil. Once again the archangel came to him, and on this occasion touched the sleeping bishop's head, awakening him with the sharp pain that darted through his brain, and leaving the imprint of his celestial fingers on his skull. Other occurrences, too, confirmed the divine origin of the commission entrusted to Aubert. A bull pointed out the precise spot where the holy edifice was to arise and traced the limits of it; a rock, which human strength was powerless to remove, fell at a push from an infant's foot, and a stroke of the bishop's staff called forth a spring of healthful water from the solid rock. Then Aubert set himself to the performance of his task. As it neared completion he sent three of his canons to Monte Gargano, in Italy, for the purpose of bringing back with them a stone from the shrine which the archangel already possessed there. They were a whole year away. On their return the landscape was changed beyond recognition. The forest of Scissy had disappeared, and the Mount stood in solitary grandeur, in the midst of a waste, now of sand and now of sea.

Such is the Mount as it appears in tradition. History shows it in a light equally interesting, though less marvellous. According to the old chronicler, Dudo of St. Quentin, Richard I., Duke of Normandy, built on the Mount a church of extraordinary size, and after having expelled the canons regular, who held the earlier structure, and whose licentious lives gave great scandal, he called in a body of monks of the Benedictine order. Less than a century later, the monks of St. Michael's furnished six transports to Duke William. In 1335, the appointment of the abbot to be at the same time military governor shows the importance which the Mount had acquired as a fortress. During the long struggle between England and France it was the bulwark of Normandy, and the vassals of thirteen fiefs were brought together to defend it. It was three times besieged by the English, but held out successfully on each occasion. During the religious wars the Huguenots also made many desperate attempts to obtain possession of the stronghold, but they too were driven back.

Even whilst retaining its dignity as a fortress, the Mount occasionally served as a prison; and one notable Scotsman—Kirkcaldy of Grange—was for awhile a captive within its walls, from which, however, he succeeded in making his escape. There, too, if a doubtful tradition may be depended upon, Cardinal La Ballue was kept in the iron cage. With regard to one poor wretch, at any rate, the pamphleteer Dubourg, there is not the comfort of a doubt. In punishment for his attacks on Louis XV., he was shut up in the den which tourists may still see, and left to die of hunger and of exposure, his body, it is said, half-gnawed by rats. It was not, however, till the French Revolution that the time-honoured pile was degraded into a regular prison. It remained so for 70 years, and it is stated that between 1793 and 1863 more than 14,000 prisoners were immured in its dungeons.

Till within recent years Mont St. Michel could be approached at low tide only, and then not without some risk. So treacherous were the sands that runners familiar with them, and thoroughly acquainted with all the forewarning signs of danger, preceded the visitors' conveyance, and more than one who neglected or despised their services paid a heavy penalty in consequence. At present, however, a broad dyke connects the Mount with the mainland, and allows access to it at any tide, affording also an excellent approach from which the “marvel” is seen to great advantage. From the causeway a narrow bridge leads to the first of the three gates which guarded the entrance to the stronghold. It is called *la porte des Michelettes*, from the two guns standing near it as relics of the heroic siege sustained in 1434 by 119 knights with six men-at-arms each against 8,000 English assailants. To the right of it is still seen the guard-house, where every stranger entering the Mount was required to leave his arms before passing through the second or barbican gate, which a moat, with draw-bridge (now no longer existing), separated from the third and most important gateway—*la porte du roi*. It is in an excellent state of preservation even now. Its iron portcullis is still in the grooves, and faint traces of the abbatial coat-of-arms may still be distinguished on the escutcheon above it; indeed, but a very slight effort of imagination is required to figure it as it appeared when successive kings of France passed under it in pilgrimage to the abbey, or when the white-cloaked knights filed through it and up the narrow street on the vigil of their patron St. Michael's feast.

After passing the *Porte du Roi* the tourist finds himself in the one street of the quaint little town. Winding and circling between houses, of which the architecture takes us back to the days when they were hostels for the accommodation of

pilgrims, the narrow passage of steep inclines and steeper steps has brought us to the guard-house. Beyond its massive arches and spacious vault, we seem to be in the very midst of the feudal world. Through this Gothic window the archers of the Lord of Estouteville during the reign of Charles VII. watched the movement of the English army, and with spanned crossbow awaited the attack of the enemy. Gazing at the front of the basilica we are reminded of the early Normans, but lately converted to Christianity, who gave expression to their genius in architecture of solid and measured proportions, destined, like their influence, to bear the test of centuries. The tympanum over the porch takes us even beyond that, to Merovingian days, to the foundation of the sanctuary on the threshold of which we are standing. It represents Saint Michael appearing to Bishop Aubert in his sleep and touching his forehead with his finger. Though a modern reproduction, the work has retained an archaic simplicity thoroughly in keeping with the subject and the surroundings. Of the church itself it is difficult to get an adequate or even satisfactory notion. It is being restored, and besides being masked by scaffolding is made unpleasant by the sand and lime-dust inseparable from the work.

If we ascend the winding staircase of the belfry and reach the exterior platform formed by the leaden roof of a side aisle, we shall get a magnificent view both of the Mount itself and of its surroundings. St. Michael's Bay stretches out in the shape of a triangle, of which the sides are formed by the Norman and Breton coast, and of which the base is the ever-shifting line where the sea rolls over the sands. Below us the whole structure of the wondrous pile stands out in bold relief. On one side we can trace the winding line of its ramparts, on the other we have the sheer cliff, wild and weather-worn. Below us is an indescribable medley of towers and spires and buttresses and turrets, foreshortened into strange perspective, suggesting an immense chess-board looked at from above. But more striking than all is the effect produced by the mist which not infrequently rises from sea. Then the cathedral, isolated from its base, seems to rest on the clouds, like those mystic, apocalyptic cities which Mediæval artists introduced into their pictures.

One of the striking points of the abbey is its cloister. It is a delicate piece of thirteenth-century architecture, and its triple rows of small columns supporting a roof of variegated tiles have an appearance of remarkable lightness—almost of fragility. According to tradition they were carved by a prisoner of the name of Gaultier. He was promised his liberty as soon as the work was done, but by that time he had completely lost his reason, and taking a wild spring over the battlements was dashed to pieces on the rocks below. At the same spot an authentic attempt at escaping from the Mount was made by Barbès. The rope which he used was too short and he broke his leg in dropping from it. The dungeon in which he was locked up for forty-eight hours as a punishment for inciting his fellow-prisoners to mutiny is one of the sights shown to the tourist. It is a dismal den into which no ray of light falls and of which the walls, three or four feet thick, are built of solid masonry. And yet it was only the *petit exil*. More awful still is the *doublette* with the round aperture in the roof to give admittance to those who were never to leave it alive, and scarcely less gruesome the charnel-house, within which the brethren were buried. All these represent the gloomy and dismal side of the old structure—might we not say the entrails of the dragon upon which Michael set his foot? It is a relief to get back again to the larger halls, to the refectory, the dormitory, or the knights' hall. It was in the last of these that the members of the order founded by Louis XI. met, and its walls were once hung with the banners which now adorn the little village church.

But to describe the "marvel" in detail would be drawing up a mere list of halls and dungeons, of crypts and chapels. Nor is it in detail that, even after a careful visit, it can be remembered. What remains indelibly fixed on the mind is the imposing grandeur of the whole—of a pile which even now has not ceased to be the wonder of the West. To do it justice the visitor should spend at least one night at Mont St. Michel. He will then have an opportunity of witnessing the singular effect of the rising flood. From a distance of some ten miles the sea comes—not sweeping, but rather percolating in. It does not advance in one continuous line, but seems to rise from out the sands, and suddenly and silently makes its presence manifest where a few moments before there was no trace of its proximity. The guide-books grandiloquently state that the speed of its approach rivals that of a horse. That is an obvious exaggeration; but, apart from the treacherous nature of the quicksands, a pedestrian would have but a poor chance if his safety depended on his outstripping it, or even on keeping up with it.

Our stay at the Mount afforded another novel experience of an altogether different kind. Owing to the narrow limits of the town, the dependencies of the hotel are, so to speak, scattered about over the face of the rock, and a zigzag of fully hundred stone steps separated our quarters from the entrance

lobby. To meet the emergency Chinese lanterns are supplied, and with these, about ten o'clock at night, a party of five of us began a solemn, or rather anything but solemn, procession up the tortuous and steep path, to the accompaniment of much laughter.

To do the Mount thoroughly, and after the fashion of the *fin-de-siècle* pilgrim, yet another thing remains to be done—an omelette must be eaten. That is a specialty of the Mount; and truly, as it comes from the experienced hands of Mme. Poulard, it is a thing to be eaten with respect and to be remembered with pleasure. And the moralist may, if he chooses, find food for meditation also in the dainty dish, and grow eloquent over the contrast between the ancient glory of the Mount and, to quote the signboards, its present "renommée de l'omelette."

THE SOUTH KENSINGTON MUSEUM.

THE report of the Science and Art Department gives the following account of the principal acquisitions by purchase during the year 1893 for the South Kensington Museum:—

A collection of old English furniture was acquired for the sum of 500*l.*, the most important specimen being the front of a coffer, carved in very high relief with subjects representing the story of St. George and the Dragon. This panel dates from the fourteenth century, and is very similar to the front of a chest preserved in York Minster. The model of a portion of the Sala del Cambio at Perugia was completed during the year by the addition of the remainder of the frescoed wall against which the *bancone* (received in 1892) stands, one bay at right angles and a portion of the ceiling. The model had been commenced by the late Cavaliere Annibale Mariani, and was finished by Count Lemmo Rossi Scotti, at a total cost of 1,000*l.* The most important acquisition during the year was a very large and magnificent Persian carpet, measuring 34 feet 6 inches by 17 feet 6 inches, bought for the sum of 2,500*l.* The Department was, however, assisted in this purchase by the generosity of Sir A. W. Franks, K.C.B., Mr. E. Steinkopff, Mr. William Morris, Mr. John Edward Taylor and other gentlemen. This most remarkable work of art came from the mosque at Ardebil, and bears the date A.H. 946 (A.D. 1540), with an inscription stating that it was the work of Maksoud of Kashan. A treasure-trove has been transferred to the charge of the Museum by Her Majesty's Treasury, at a valuation of 175*l.* It consists of seven pieces of silver plate, dating from 1578 to 1696. These specimens were found in a rabbit-burrow at Stoke Prior, near Leominster, Herefordshire. A collection of Hispano-Moresque earthenware, comprising 120 specimens, was purchased for 797*l.* A Japanese room, which had been on loan for some time at the Bethnal Green Museum, was acquired for the sum of 70*l.* At the sale of the Bateman Collection twenty-one works of art were secured, including a Limoges enamel triptych of about the year 1500, a carved ivory group of the Coronation of the Virgin, an Italian chalice enriched with enamels and dated 1365, two German silver-gilt cups and a portion of a girdle in enamelled gold—at a cost of 609*l.* 2*s.* 10*d.* A leaf of a Limoges enamel triptych painted *en grisaille*, representing part of the subject of St. John the Baptist Preaching in the Wilderness, was bought for 120*l.* The other two leaves had been for many years in the Museum, whilst the third leaf had been the property of M. Spitzer. The principal purchase at the sale of the celebrated Spitzer Collection, which took place in 1893 in Paris, consisted of a beautiful cover of a Textus or MS. of the Gospels, overlaid with gold plaques, and enriched with *cloisonné* enamel work and precious stones (1,571*l.* 10*s.*). At the same sale a magnificently-worked English rim-lock, made by Richard Bickford, of London, and bearing the Medici arms, was secured for 183*l.* 14*s.*, as well as an enamelled pendant jewel in the form of a ship for 157*l.* 10*s.* At the sale of the Baron de Cosson's arms and armour the following specimens were bought for the sum of 281*l.* 3*s.* 3*d.*:—A German wheel-lock pistol, inlaid with staghorn and dated 1579; an engraved steel casque of Italian workmanship of about the year 1535; a steel chanfron from Spain, engraved and gilt, of the first half of the sixteenth century; a leather powder-flask and two priming-flasks. From the Field sale were obtained a boxwood group of the Virgin and Child in the style of Martin Schöngauer for 88*l.* 4*s.*, and a pair of Limoges enamel salt-cellars for 518*l.* 3*s.* 6*d.*, the work of Jean Limousin, who was working in the early years of the seventeenth century. Sixteen specimens of Rhodian pottery were bought for 200*l.*, and a Florentine bronze bowl of the end of the fifteenth century cost 70*l.* A valuable collection of early textile fabrics, including stuffs woven at Byzantium, Palermo and Lucca, as well as a magnificent altar-frontal of Lucca workmanship of the fourteenth century, was acquired for 948*l.* 12*s.* 4*d.* A large Brussels tapestry worked with subjects from the Court of Love, War and Religion, was obtained for

3154., and a very representative collection of German ironwork was bought for the sum of 650*l*.

The principal gifts received during the year were:—A steeple-shaped hat of the time of James I., given by Mr. J. Seymour Lucas, A.R.A.; a terra-cotta bas-relief of the Virgin and Child, given by Mr. C. Fairfax Murray; models of a tapestry and a carpet loom, given by Mr. William Morris; a plaster ceiling from Crosby Hall Chambers, given by the directors of the Bank of Scotland; a carved ivory figure of Our Lord for a crucifix, French, early eighteenth century, given by Captain C. Waldo-Sibthorp; and a German enamelled earthenware stove, given by Mr. Henry Willett.

The reproductions acquired in 1893 comprised twenty-four plaster casts, viz.:—A copy of a head of Hera, of the school of Polycleitus, discovered on the site of the temple of Hera in the Heraion, near Argos, and presented by the American School of Classical Studies, Athens; a copy of the head of the bronze lion of St. Mark on the Piazzetta, Venice; the group of *Judith and Holofernes* by Donatello, in the Loggia dei Lanzi, Florence; a recumbent effigy of Beatrice d'Este, attributed to Cristoforo Solari, in the Certosa, near Pavia; a relief of the Virgin and Child, with the young St. John the Baptist, by Bartolommeo Bellano (acquired in exchange from the Berlin Museum); a copy of a portrait in relief of Andrea Mantegna, from his tomb in Padua; a portion of the portal of the north transept of Bordeaux Cathedral, date about 1300; and a French carved wood door of the sixteenth century. A cast was also obtained of a fireplace, dated 1633, formerly in Crosby Hall Chambers, London; there was also a collection of 477 reproductions of Italian, French and German medals cast by M. Liard.

For the Indian section forty-eight objects were purchased, at a cost of 178*l*. 9*s*. 6*d*. Of these a small collection of old Newar metalwork from Nepal, a collection of metalwork and glassware formed by Lieut.-Colonel Cole at Bijapur, and a gold "rose" chain of the eighteenth century were the most important. Works of art were also presented by Mr. N. P. Anthony, the Misses Palmer-Lovell, Mrs. Ella Sandford, General Sir W. M. S. McMurdo, G.C.B., and Mr. A. F. Sealy.

Mr. Weale, the keeper of the Art Library, reports as follows:—The number of volumes and pamphlets acquired has been 1,808, 346 of which have been presented and 1,462 purchased. The most noteworthy are:—Baron A. Liedts's "*Anticennes Dentelles Belges*," Antwerp, 1889-90. Privately printed. F. Moreau's "*Album Caranda*," 1879-93. "*Oriental Carpets*," published by the Imperial Museum at Vienna. "*Virgil Solis*," "*Biblische Figuren*," Frankfurt a/m, 1560.

The number of drawings acquired has been 861, seven of which were presented. The most noteworthy are 104 sheets of Mediaeval costume drawn and coloured by Mr. Lake Price. Nine hundred and fifty-three prints have been added to the collection and 1,289 photographs.

The new general reading-room catalogue, embodying in one alphabetical series all the books acquired before September 1890, has made good progress. The first twenty-one volumes, down to MUE, are now at the disposal of readers.

During the past year 4,282 works have been catalogued and 5,208 slips printed. The titles of fresh acquisitions have been printed regularly every week, and these weekly lists posted up in the library, so that readers are informed of and can consult any book at the latest on the Saturday of the week following that in which it is acquired. Prior to my appointment volumes or series of volumes (periodical publications, transactions of societies, &c.), no matter how many separate papers they might contain, received only one general mention in the catalogue. Since that time every volume has been examined, and each article or paper in any way relating to art has also been catalogued independently.

Moreover, at the same time an abbreviated copy of the title of every work is prepared by the cataloguer for insertion in each of the classed lists to the subject of which its contents may refer. These classed lists are thirty-three in number; one of them is almost ready to send to the printers and two others are in a forward state. Cut-up copies of these will be placed in the reading-room for the use of readers, fully press-marked and kept up to date by weekly insertions.

Special provisions have recently been made for the benefit of students. A new room has been prepared for the use of those who wish to copy in water-colours, or to consult rare books, prints or photographs. Arrangements have been made so that they can avail themselves of these advantages in the evenings on which the museum is open, while previously it was not found possible to permit the use of water-colours after dusk.

A catalogue of the Japanese books and albums of prints in the library has been published this year. The titles were translated and written by Mr. Kowaki, and revised and seen through the press by Mr. Strange. The catalogue of loose prints and drawings which is to form the second part of this Japanese catalogue is also nearly completed and will be published shortly. Students of ornament and designers have

found very useful a series of proofs taken by means of photography from the large collection of Japanese stencils in the library.

The rearrangement and classification of the contents of the bookcases is making good progress.

FOLKTON CHURCH.

THE parish church of Folkton near Scarborough is now being partially restored. The works which are at present being carried out are the repairs of the masonry of the inside of the church and also the walls. The floor of the church is being lowered to its original level and the alleys repaired with rubbed flags, the floor of the sacarium being tiled. The nave of the church will be seated with open benches, and stalls are being placed in the chancel, and new altar rails and standards, and there is to be a new pulpit. The wood windows on the south side have been replaced with stone ones of fifteenth-century character, and a new door is also to be placed on this side of the church. The whole of the works are under the superintendence of Messrs. Smith, Brodrick & Lowther, architects, of Hull, and the contract is being carried out by Mr. R. Kilvington, of Nafferton, and Mr. Rudd, of Duffield.

CHURCH BUILDING AND RESTORATION.

Bridlington.—A new Catholic church was opened by Cardinal Vaughan on Thursday. The building has been designed by and carried out under the superintendence of Messrs. Smith, Brodrick & Lowther, architects, Hull. The church is in an early style of Gothic architecture, and consists of a nave, 54 feet long by 17 feet wide, with north and south aisles, 8 feet wide, and at the end of each aisle is a side chapel; one is dedicated to the Blessed Virgin, and the other to the Sacred Heart. Each chapel has above the altar and at the side beautiful tracéried stone windows, which have been filled in with stained-glass; the roofs are groined with the best selected pitch pine boards and moulded ribs, which terminate with a carved boss. The sanctuary is 20 feet in length and 17 feet in width, and has an octagonal apse with tracéried stone windows, and is divided from the nave by a lofty arch resting on clustered shafts of polished Derbyshire marble, and capitals richly carved in Early English foliage and moulded bands and bases. The arches separating the sanctuary from the side chapels are filled in with tracéried oak screens. The nave is divided on either side from the aisles by arcades of four bays with moulded arches on octagonal shafts of Hopton wood, polished stone, and moulded caps and bases. The nave has a clerestory of lancet-headed windows, and the aisles are also lighted by similar shaped windows. The choir gallery is at the west end above the main entrance, with an organ chamber at one side. The west front of the church is the most prominent feature; it is built of the best red stock bricks and stone dressings, and the massive angle buttresses terminate in lofty pinnacles of stone. A long two-light tracéried window and a single light on either side fill the gable above the western entrance, carved stone niches are fixed between the centre and side windows for statues of the patron saints. The gable is coped with moulded stone, and the apex is a finely worked cross. There is a large working and private sacristy, and in a recess in the aisle wall is the confessional. A large heating chamber is formed below the sacristy for a high-pressure heating apparatus. Accommodation is provided for about 800 adults.

GENERAL.

Sir H. de Trafford, Bart., has given a site in Liverpool Road, Eccles, for the erection of a new Catholic church.

Sir Edward Landseer's house in St. John's Wood is to be pulled down, the site being required for the new railway.

Rev. Dr. Paton and Mrs. Paton, of Nottingham, have offered 1,000*l*. for a new wing to be added to the Children's Convalescent Home, West Kirby, Cheshire, in memory of their son, W. P. Paton, West Kirby, whose recent death at Barmouth evoked great regret and sympathy.

The Design of Mr. R. Knill Freeman has been adopted for the Central Higher Grade School, Bolton. The design by Mr. J. Simpson was placed second, and one by Messrs Woodhouse & Potts was third. The building is to be four storeys in height, and the estimated cost is 20,000*l*.

The London County Council have selected Dr. Collins and Mr. T. Blashill as representatives at the Hygiene Congress in Buda Pesth.

Balderton Hall, a sixteenth-century mansion in Shropshire, with an estate of 352 acres, has been purchased by Mr. T. Parker Farden, of Chester, for 13,200*l*.

The Architect.

THE WEEK.

A MEETING of the Governors of the Richmond Lunatic Asylum, Dublin, was held on Tuesday. It is proposed to erect a new asylum at Portrane, but an extension of the Richmond Asylum is also contemplated, which alone will cost 65,000*l*. One of the Governors considered that the wisest course would be to sell the asylum and to remove all the patients to Portrane. A decision on the subject cannot be given until the financial question is determined. It was therefore resolved, "That the Chief Secretary be requested to ascertain from the Treasury and inform the Board what relief will be conceded under the recently passed Act in the rate of interest charged on advances to lunatic asylum buildings. This Board having in view the necessity of being soon obliged to provide a sum not likely to fall far short of 200,000*l*., hope that this matter will be promptly and generously dealt with by the Government, who appear to be making a considerable profit out of loans for lunatic asylums; while in the opinion of this Board they should afford from any available funds aid towards keeping down the heavy consequent taxation."

IN the speech which Mr. WYKE BAYLISS delivered in responding to one of the toasts at the dinner to the hangers of the Autumn Exhibition, which was given by the Liverpool Art Club, he was happy in a comparison which was suggested by the architectural subjects to which he devotes his talents. He said:—"Art is like a great cathedral, with its choir, its transepts, its nave, its aisles, its little chapel, each one beautiful in itself, but the whole a splendour than which there is no greater splendour in the world. In the case of art there is the choir—that is the Royal Academy, where the 'Te Deums' are sung and the incense is offered. There are the transepts; they are the two water-colour societies, always by the very fate of the scheme placed as far away as possible from each other. There is the nave; it is the Royal Society of British Artists, built seventy years ago, and as strong now as ever it has been in its career. There are the aisles and the little chapels; that is, the splendid work done in our provincial societies, the little chapels, mind, the little chapels of Newlyn and Glasgow and Liverpool, if you will—the little chapels where the miracles are wrought, that is the point. That is where the miracles are wrought—miracles of daring at Newlyn, of colour in Glasgow—miracles of all kind of splendid work." A cathedral makes a city, but Mr. BAYLISS rightly considered that art was not bounded by city walls or frontiers; and if there is, he said, "one overmastering feeling in my mind with regard to art, it is this, that art is not metropolitan, that art is not provincial, that art is not in its highest sense even national. Art is greater than a city, than a people, than a nation; it is cosmopolitan. Every splendour of thought the world possesses should be swept into the treasury of art; and yet while this is true, it is also true that art is in its splendour in a nation when it is strong in its cities. When art was greatest in the Renaissance there was a school at Venice, a school at Naples, a school at Florence; not merely a school in Rome; and it is so now. Our hope for the future does not lie in what we are doing in London, but what our nation is doing in Edinburgh, in Glasgow, in Newlyn, in Manchester, in Nottingham, in Bristol, in many other places, and above all in Liverpool." The position assigned to Liverpool work will not be generally approved, but allowance should be made for the circumstances which accompanied the speech.

MEISSONIER, the painter, never appeared to be a man who could have romantic visions, for a painter who was so absorbed in microscopic details must have been a realist. But he was a visionary when he erected his mansion at the junction of the Rue Legendre with the Boulevard Malesherbes. He intended to create the most wonderful Renaissance house in all Paris. It was to be designed by himself

The furniture was to be copied from examples selected by him. He intended to carve some of the great chimney-pieces. The staircase was to be adorned with frescoes painted by him. So far his dreams were like those of a great many artists. But MEISSONIER was not satisfied with them. After creating the mansion and making of it a shrine for the paintings he withheld from amateurs, and the countless studies which he had so long concealed, he intended to offer the building and its treasures to France. But in return he expected the State to pay him a revenue that would be adequate to his requirements, and to provide for his descendants by making them in succession the conservators of the property. France has sufficient responsibilities without undertaking one so onerous. A number of circumstances to which we need not refer caused the dispersion of MEISSONIER's property after his death. The house which was built partly to serve the painter's needs, which were peculiar, and partly as a museum, was not adapted to become the residence of ordinary mortals, however wealthy they might be. It was remarkable without as well as within, but as commonly happens with the works of amateur architects it could not be transformed. The site is undoubtedly very valuable, but in order to utilise it MEISSONIER's Parisian home is now being demolished. In a short time every trace of it will be removed. The stone and wood which the painter had elaborated to satisfy his fastidiousness will be scattered far and wide.

THE operations on the site of the Temple of Hera or Juno, near Argos, having been suspended until next spring, a special correspondent of the *Times* has sent an account of what has been accomplished. The excavations, which were commenced in February 1892, were carried out by the American School of Archæology, with the aid of about two hundred and fifty labourers, under the direction of Dr. WALDSTEIN. The site is on a slope of Mount Eubœa, and the temple and surrounding buildings must have been most impressive when seen from the plain. The explorations on the site of the older temple have revealed, says the correspondent, a pavement of large polygonal slabs, some 45 metres in length by 35 in breadth, covering a considerable portion of the terrace supported by the cyclopean retaining-wall. Whether this pavement lay in front of the temple or supported its columns it is impossible to say, as no traces of foundations have been discovered such as might enable us to reconstruct the design of the building. The only vestige of the temple which remains is a portion of wall which apparently formed part of the substructure of the cella. The later temple is not so much of a puzzle, for "enough of fragments remain from all parts of the building to enable us to form a fairly accurate idea of its construction and architectural features. It was a Doric peripteral hexastyle, with twelve columns on the flanks, and with a stereobate measuring 39·60 metres by 19·94. The ratio of length to width is thus somewhat less than in the Parthenon, and falls in with the general rule that this proportion decreased from earlier to later times. The columns were of porous stone, with a fluting of twenty channels, the echinus of the capital showing a delicate convex curve. The entablature was also of porous stone, with the exception of the triglyphs, which, as well as the pediments, were of black marble. The sculptures in the metopes and pediments were of Parian marble, and we know from PAUSANIAS that the subjects which they represented were the birth of ZEUS, the Gigantomachia, the expedition against Troy, and the capture of that city. A long stoa has been revealed containing a range of at least nineteen pillars, some of which were found *in situ*. The stoa appears to have been filled with statues, the bases of which remain, and at its western end a very curious series of waterworks has been discovered. Terra-cotta idols, plaques and images of animals, bronze statuettes, rings and pins, beads, scarabs and seals of amber, glass or porcelain, together with other objects, some belonging to the archaic period and others to the remotest antiquity, have been found literally in hundreds." The most interesting of the fragments of sculpture is a head of a warrior, which has characteristics that correspond with those ascribed to the works of POLYCLETUS.

THE SAINT-AUBIN FAMILY.*

THE interest which the works of the minor French artists of the eighteenth century have revived cannot be altogether ascribed to their intrinsic merits. If they had lived at an earlier or later period, FRAGONARD, GREUZE, PRUD'HON, the MOREAUS, the COCHINS and others would probably be comprised with the crowd of artists who have had a brief spell of reputation among their contemporaries and then passed into oblivion. They are now considered as if they were actors employed in some "curtain raiser" while a great tragic spectacle was in preparation on the same stage. It seems incredible that men could be merry and occupy themselves with pastoral and idyllic scenes regardless of what was so near. Since art began there were no such troops of amorini produced as we find in the French designs of that period, and they became almost countless as the time of the Revolution drew nigh. In the most high and palmy state of Rome, according to SHAKESPEARE, before the death of the mightiest JULIUS, the sheeted dead did squeak and gibber in the streets, and "the like precursor of fierce events" was witnessed elsewhere. If the drawings of artists might be relied on as evidence, it could be supposed that the events of 1789 were immediately preceded in France by a revival of the golden age, and the prologue to the tragedy was accompanied with the pipes and tabors of Arcadian shepherds and shepherdesses.

The family of the SAINT-AUBINS were among the artists who were chosen by destiny to delude men and make them believe that France was happy and joyous. They sprung from the class of men who suffered most in the last days of feudalism, viz. the small farmers. The first who abandoned the peasant's hut to seek after fortune in Paris somehow acquired the art of embroidery, and as a craftsman entered the service of the Duchess LESLIGUIÈRES. His frames were set up in the porter's lodge, and he was consequently able to act as concierge. His son, GABRIEL-GERMAIN, born in 1696, was also taught the art and became "brodeur du roi." That dignity brought him privileges rather than money. He was not subjected to the laws and regulations which weighed in those days upon the ordinary citizens of Paris. On the other hand, he may have despised the citizens' thrift, for, like all the royal tradesmen of whom we have read, he died in poverty. He left five children, who were free to follow art. CHARLES-GERMAIN became one of the royal draughtsmen. GABRIEL followed painting, and occupied himself in sketching in all times and places, but he was "singulier, farouche et malpropre," and therefore not adapted to shine in salons. LOUIS-MICHEL was a painter at the Sèvres factory; ATHANASE was attracted by the stage; AUGUSTIN, who was a designer and engraver, was elected into the Académie Royale, and was appointed royal engraver. It is not necessary for us to take any further notice of the lives of LOUIS and ATHANASE.

The drawings by CHARLES which have survived, and the engravings from his designs, are evidence of the admiration for flowers which is still a characteristic of the industrial arts in France. He prepared a portfolio of copies of plants containing 250 water-colours, which occupied his intervals of work during forty years. He etched a collection of "petits bouquets," in which flowers are mixed with various forms, and another of Chinese flowers and caprices which were his own invention. He prepared also a series of monograms made up of plant-forms, which are interesting not only from their elements but as emblems of the tributes which the earth was supposed to offer to the French nobles. A more useful work was the treatise on the art of embroidery produced by order of the Academy of Sciences, in which the plates are masterpieces of their class. CHARLES DE SAINT-AUBIN was the fashionable designer of his time. He was patronised by Madame DE POMPADOUR, and the noblest ladies in France showed their loyalty by obtaining his aid. In his old days he discovered that he was only one of the slaves of fashion, and therefore could not expect to have any claim to fame. "My forty thousand designs," he wrote, "after serving to guide embroiderers and manufacturers of stuffs and laces, have entered into nothingness, where I shall soon rejoin them." He was, however, a sort of

philosopher, who believed that as all men and women are merely players, amusement was to be gained by every wise looker-on. His favourite resort or puppet-show was the sale-room for bric-à-brac, where he saw many comedies. He knew all the performers, he said, as well the strings by which they were worked, and was willing to admit that as they amused him he also served in turn for their enjoyment.

The "farouche et malpropre" GABRIEL was more of a genius. He tried to follow the beaten track to Rome under academical guides, but he broke down on the way. Under the influence of ambition he produced Homeric and scriptural freaks, but nobody's feelings were oppressed by them. SEDAINE, the dramatist, had taken his measure exactly when he advised him to leave epic subjects and stick to trifles:—

Quelque sujet tendre ou galant,
Un rien, une esquisse légère,
Sur ce carré de papier blanc.

Yet the scraps of white paper have a better chance of surviving than most of the great oil-paintings of that age. It would be difficult for any man to have more of the passion for recording things. Many inhabitants of the city must have looked on him as a lunatic. He would be a worthy companion for the "Nephew of Rameau." He was to be seen everywhere in Paris filling his sketch-book. He was engaged in the task while going from one scene to another. No place was sacred for him. In a church he was regardless of the distraction he caused so long as he secured materials for a sketch or two. The preacher might exclaim when he saw the congregation less intent on his oratory than on the operations of the shabby man; but GABRIEL was indifferent. If a grandee would not let himself be sketched, the artist contrived to get behind the screen in a dining-room, and, regardless of the Bastille, accomplished his task. Many thousands of the sketches were found after his death in his room in the house of a cabinet-maker in the Rue de Beauvais, but only a few can now be identified. Their value must excite regret for the disappearance of so large a mass of documents which as records would surpass any chronicle of the time. For GABRIEL, although he might appear to be more uncivilised than a Huron, was able to seize the momentary actions of the most refined people of Paris. In his representation of the spectacles in which they took part there is not an ungraceful attitude. The open-air balls may appear to be on the edge of a volcano, but a master of the art would testify to the accuracy of the steps and the exalted deportment. His etching of the Salon of 1753 would serve for this year. There is the same anxiety among ladies to display their robes, the same desire to find fault with details of costume, the endeavour to be seen rather than to see on the part of the majority, and the occasional efforts of a few to appear carried away by their admiration of the pictures. As became a man who was "singulier," GABRIEL DE SAINT-AUBIN was probably more happy when he was immortalising the street scenes which suggested the weakness of the police, or the tumble-down booths in the fairs or on the Pont Neuf, the latter being the perquisites assigned to the widows of the Academicians of St. LUKE. He seems to have found delight in the contrasts which the streets offered, and in which GABRIEL himself, with his hair as well as his stockings touched up with white crayon, was as bizarre a figure as could be found. A man of his character was a suggestive study for the comedians, and in return he represented many a theatrical scene. He had reason for his interest in the stage, for one of his nieces, a daughter of the porcelain painter, was an actress. Afterwards she married CLAUDE ALEXANDRE RICHARD, an architect who, according to the family register (appended to the collection of drawings of plants), was a handsome man who possessed "une belle clientèle," but who lost it and his fortune also through his neglect of order and arrangement. It may be mentioned here that GABRIEL was closely associated with architects, for he taught drawing in BLONDEL'S own school, which was well attended by students.

There was, perhaps, less genius in AUGUSTIN DE SAINT-AUBIN, but what he possessed was better disciplined and was more useful to his contemporaries. His first teacher was his eccentric brother GABRIEL, who endeavoured to make of him an engraver of historical pieces. He worked at plates under the direction of FESSARD. Becoming acquainted with GRAVELOT he was allowed to produce

* *Les Artistes Célèbres: Les Saint-Aubin.* Par Adrien Moureau. Paris: Librairie de l'Art.

vignettes after that designer's sketches, and those for the "Decameron" are among the most charming examples of book-plates. He was also fortunate in coming under the influence of LAURENT CARS, who was one of the best engravers of the French school.

At that time an engraver was more than an adept in mechanical reproduction. When AUGUSTIN DE SAINT-AUBIN commenced independent practice, he was as well able to design dainty vignettes as any of the specialists. The labels which he produced in his youth for the drawers of a cabinet of natural history belonging to the Duc DE CHEVREUX, and which were suggestive of the contents, denote much skill in decorative composition. It was easy for an artist who could impart that grace which befitted them to book-plates, invitations to spectacles, business cards and other miniature works, to obtain commissions in those days. The patronage of the aristocracy was the best testimony to his ability which AUGUSTIN could have obtained. In his designs he appeared the refined gentleman. Like his uncle, he drew indoor and outdoor scenes, but while GABRIEL introduced occasional cynical touches whenever he presented a crowd of grandes, the younger artist carefully avoided everything that suggested a want of reverence. It was becoming to hide GABRIEL behind a screen in a salon, but the nephew could be allowed to appear, whether he was treated as a guest or a valet. As DICKENS'S Mr. CHOPS said, "It ain't so much that a person goes into society as that society goes into a person," and AUGUSTIN DE SAINT-AUBIN seemed to have imbibed so much of it that all his etching tools should have had silver handles. He was just the man to illustrate fashionable romances. It is no wonder that many artists who might consider him as a rival were anxious to secure his skill to engrave plates from their drawings. He could impart dignity to a portrait or to an assembly of figures, and in consequence COCHIN, who possessed a sort of concession of court ceremonies and royal portraits, made him a co-operator.

The *savants* of the time appreciated him not less than the masters of ceremonies. The Abbé BARTHÉLEMY, the author of "Anacharsis," was the first among them who perceived that old coins and medals would obtain a novel interest if etchings of them were made by AUGUSTIN. A description of the engraved gems in the possession of the Duc D'ORLÉANS was brought out and two hundred plates for it were produced by the engraver. The arrangement of the subjects was due to the Abbé LE BLOND or the Abbé CHAU, but the engraver surrounded the medals with ornament that was novel. Those with figures of river gods are set in a collection of water-plants. SILENUS appears amidst grapes, wine-skins, &c. The punishment of MARSYAS is suggested by a knife, whips and a lyre. The attributes are not conventionalised, and if they appear to have more importance than the medals, it must be allowed that they form effective backgrounds. Many of the gems have great interest. One of them with MARS and VENUS engraved on it represents the goddess in a manner that has been taken as an indication of the Venus of Melos when perfect.

The Revolution brought suffering to AUGUSTIN DE SAINT-AUBIN. He was supposed to have been one of the satellites of the court and as such to have merited the contempt of all virtuous citizens. The French Republicans were as severe as the English Puritans in their treatment of artists. The designer and engraver was ignored, and if his life was spared it was only temporarily, for he was doomed to poverty and the privations he endured overcame him. When the Empire was established he had some faint expectation of patronage. Three months before his death he undertook a series of portraits of the kings of France from PHARAMOND to NAPOLEON, but it was a task that was unworthy of him. When he died his only property was his collection of engravings. A set of his own works, which to-day would be contested in the auction-room by the foremost amateurs and directors of museums, was sold for 4,210 francs. The proofs by other masters which he prized were sold for nominal prices. AUGUSTIN had ministered to fashion, which in its turn mocked him.

The works of the SAINT-AUBIN family are now difficult to obtain, and they have to be paid for at prices which are a testimony to their scarcity. In M. MOUREAU'S memoir

there are reproductions of 172 examples. Students and amateurs of limited purses may well be thankful for the enterprise which brings such a collection within their means. M. MOUREAU has already proved his competence to treat of the art and artists of the eighteenth century, and "Les Saint-Aubin" will increase his reputation as a scholar and critic.

SHOTTESBROOK CHURCH.

A PARTY of members of the Reading Archæological Society lately visited, according to the *Reading Observer*, Shottesbrook Church, where Mr. W. Ravenscroft read a paper, in the course of which he said:—We are assembled beneath the roof of one of the most perfect examples of late Decorated work which this country possesses; indeed, I very much doubt if it has its parallel when the many points of its completeness are taken into due consideration, for it is not merely in one or two respects, but in at least half a dozen, that this perfection is evident, as in the course of the few remarks I have to make I shall endeavour to show. Let me briefly enumerate the points of perfection to which I have alluded. At first observe the plan. It is that of a complete cross, with the peculiarity that the nave, which represents its stem, is shorter than the choir, which represents its head, the reason for which probably lies in the scanty need of accommodation for the population of the parish. Next, it is entirely built in one style of architecture, and, so far as the old work is concerned, rigidly adheres to that style throughout, even to the font and the smallest details. Thirdly, its proportion is exquisite, and seen from the park how serenely it stands in the simple dignity of its matchless beauty. It is a little church, but it has not the suspicion of a plaything about it. Fourthly, its simplicity of detail is truly remarkable, and yet how rich it is. There is scarcely a bit of carved work; no deeply-recessed mouldings with strong lines of shade, even its freestone is as sparingly used as possible, and yet it has not in it a suggestion of meagreness. Fifthly, its situation is unique. And lastly, it is exactly what was wanted for its purpose, for although a parish church it was not that primarily, as we shall presently see. Let us hastily trace the history of this interesting building. It had a predecessor, probably Saxon or Norman, for mention of such is made in Domesday Book, but it was not valued very much, for Hearne, as the result of his reading, finds it described as "far less decent and beautiful" than the present church. So in the year of our Lord 1337, Sir William Trussell, of Cubblestone, in Staffordshire, founded a charity or college for a warden, five priests and two clerks, and built them this church in honour of St. John the Baptist. The institution is endowed with a rent-charge of 40s. per annum on the manor, of which he was the lord. Shortly after its foundation the college buildings were almost destroyed by fire, in consequence of which misfortune the church of Basildon and other lands were given for its support; so the little institution lived on until the reign of Edward VI., when in the year 1547-48 it was suppressed, the revenues then being estimated at 32*l.* 18*s.* 8*d.* clear yearly value. The college was placed on the south side of the church, and the remains of a small doorway in the south-west angle of the south transept with a filled-up gap in the garden wall opposite will indicate the way of approach from the domestic buildings to the church, a way which at one time was enclosed with a covered passage, which Hearne mentions as having been talked of when he was a boy, and by which the people from the farmhouse occupying the site of the college came into church. At the suppression the lands of the college were granted to the Weldon family and subsequently came into the hands of the Vansittarts. The only portion of the church which seems to have been removed is the sacristy, the doorway to which may still be seen as a recess in the north wall of the chancel. I cannot find when this was removed, and the exterior of this doorway, together with the buttress built over it, are so cleverly managed as largely to destroy the evidence of there having been a sacristy at all. The spire has been rebuilt within my own recollection, it having fallen into a sad state of decay and indeed become dangerous. It is well worth while to ascend the turret stairs, both for the sake of the view from the parapet as well as to look up into the interior of the spire, the construction of which is an interesting piece of work. The restoration of the spire, I remember well, raised a good deal of criticism, especially as to authority for introducing the spire lights and omitting the pinnacles. After all, however, I think it must be admitted that the spire is a very handsome one, and it is only to be wished the late Mr. G. E. Street had been as happy in the other portions of his restoration, especially the chancel screen and pulpit, as in this his much later work. And by the way, the mention of the chancel screen raises the question as to where stood the rood-loft. I am inclined to think, with our worthy treasurer (the Rev. J. M. Guilding), that it was across the westernmost arch of the tower and then could have been approached by means of the turret staircase. Not only so,

but the evidence of subsidiary altars in the transepts would naturally, although not necessarily, help to point out this archway as the proper place for the holy rood. It now only remains to offer a few brief remarks on the monuments and brasses in which this church is really rich. The most important of these is, of course, that of the founder, Sir William Trussell and his wife Maud, the daughter of Sir William Butler, Lord of Weunne. It occupies the whole of the north end of the north transept, and consists of a double altar-tomb, with rich canopy-work over it cut in chalk. There are no effigies, but at one time the shields in the canopy were emblazoned. In the days of Hearne, through a defect in the wall the remains of the founder and his wife were to be seen, the former in the westernmost tomb wrapped up in lead, and his wife in leather at his feet. The monument to William Throckmorton, warden of the college, is a very curious one. It is situated against the north wall of the chancel, and consists of an effigy considerably under life-size, attired in a long gown, with doctor's hood and cap, having hands conjoined, and in a stone coffin. The most important brass is on a large slab, and represents two male figures. It is described as having been in the centre of the chancel, and its present position, if it has not been shifted, would add emphasis to the suggestion that the rood-screen was across the western tower arch. The figures are those of two elderly men, singularly alike, but one is evidently a priest and the other a layman. The work also is doubtless of the fourteenth century, but there is no inscription left to tell us who are represented by these figures. The supposition, however, is that the one is a memorial to the first master of the college, and that his brother is commemorated by the other. It is remarkably fine, especially in its architectural work. There are monuments to the Cherry family, whose hospitality to the non-juring clergy of the reign of William and Mary made Shottesbrook House the famous rendezvous it became in that time of trouble, and here also lies the learned Henry Dodwell. Hearne speaks of yet another tomb, which he calls that of the architect, of whom he tells the story that, having completed the spire, he called for wine and ale to drink the king's health, which having been drunk at the top of the spire, he accidentally fell and was dashed to pieces.

DISCOVERIES IN CRETE.

AN interesting account appears in the *Times* of Wednesday, by Mr. A. J. Evans, of his archaeological discoveries in Crete. He has obtained over eighty different types of hieroglyphic stones. Mr. Evans says:—They divide themselves into classes, such as parts of the human body like the eye or leg; of animals, as the head of a wolf or ibex; implements and weapons; ewers or other vessels; a kind of primitive lyre formed of two horns with cross strings; parts of dwelling-houses, such as gates or shutters, floral and vegetable designs; moon and stars and various geometrical motives such as crosses and concentric circles, besides indeterminate figures. But this is not all. On some of the stones the symbols take a more linear or alphabetic form, the origin of which in certain cases actually be traced, from its occurrence in a pictographic form on other examples; in this way, for example, the gate symbol, the double axe and the dagger are simplified before our eyes into purely linear outlines. These alphabetic symbols I was further able to trace on other materials. They occur as *graffiti* on vases of Mycenaean age, as marks on axes, and finally on the blocks of a prehistoric building with complicated passages on the site of Knosos—perhaps a palace, perhaps the actual “labyrinth” of Cretan tradition. Several of the same signs reappear on the fragments of early Aegean pottery found by Professor Petrie in Egypt, amidst relics of the twelfth and eighteenth dynasties, and these Egyptian parallels are made the more interesting by the fact that from a Cretan deposit at Phaestos containing a rude steatite whorl with strangely alphabetic symbols, together with stones approaching in character to the Cretan hieroglyphic series, I noticed several imported Egyptian scarabs of twelfth dynasty date—belonging, that is, to the middle of the third millennium before our era, while the latest elements in the deposit did not seem to come down beyond 1800 B.C. From other evidence into which it is impossible to enter here, it appears that the Cretan symbols, both pictographic and linear, belong in the main to the second millennium B.C. and to the days of the Mycenaean civilisation. The linear forms, indeed, find parallels in certain *graffiti* on vase handles from Mycenae itself. In another direction they seem to have actually survived as a vehicle of Greek writing to a much later date. Several of the symbols are, in fact, indistinguishable from those of the syllabic alphabet preserved by the Cypriote Greeks long after their more Western brethren had learnt the use of Phœnician characters.

The earliest of the hieroglyphic stones fit on to a still earlier and ruder series representing in some cases the actual owners of the signets—if such they may be called—who from the asso-

ciated attributes and figures seem to have been owners of flocks and herds of sheep and goats, warriors with spears and round shields, huntsmen, and in one case, if I mistake not, a man within a walled enclosure. We have here a glimpse of Cretan life in the third millennium before our era, and in the forms of the stones and the engraved objects we may trace besides more than one link between the Aegean islanders and the primitive populations of Asia Minor—comparisons which extend at least as far afield as Cilicia. Of the later Mycenaean class of engraved gems I was able, thanks to a happy accident of Cretan superstition, to collect a considerable number. I found that the women called them “milk-stones” (*γαλόπετρας*), and wore them round their necks as charms of great virtue. I therefore made a house-to-house visitation in the villages, and by one means and another prevailed on many women to display their talismans. I soon discovered that ladies of a certain age were not altogether averse to parting with their “milk-stones” for a consideration, but with the young women it was a more delicate business. In some cases I succeeded in swopping stones of smaller archaeological value, the lactiferous qualities of which, however, I could safely guarantee. But not unfrequently all persuasion was useless, and the only reply was, “I would not sell it for ten pounds. Don't you see my baby?” One could not of course contend with superstition such as this, but even in such cases I was generally able to procure an impression of the gem. The evidence thus gathered amply shows that Crete was a principal centre of Mycenaean glyptic art. The subjects are most varied. Many gems such as those with lions and *agrimia*, or Cretan wild goats, record the prowess of the chase; others are of a more pastoral nature, and a Mycenaean prototype of the “Good Shepherd” appears bearing a calf on his shoulders. Vases with spouts and high beaks and two-handled goblets are of frequent occurrence—birds and butterflies, fishes and ships, *frutta di mare* in the shape of cuttlefish and crabs. Some of the subjects are of a heraldic or quasi architectural character—goats as supporters of a palm-tree, two lions on either side of a column, recalling the Lion Gate of Mycenae, the gabled fronts of shrines or houses. Here are griffins and minotaurs, scenes of cult and offering; and a gold ring, one of my most precious spoils, similar in form to the rings found by Dr. Schliemann in the Acropolis graves at Mycenae, seems to illustrate a kind of stone worship that still survives in India and elsewhere to the present day. The god, brought down by ritual and incantation, is seen descending on the sacred obelisk that thus becomes his temporary dwelling-place, or, in biblical language, a “Bethel.”

Proofs of early Egyptian contact continued to accumulate throughout my journey. I collected a whole series of early stone vessels, some of which are either exact copies of Egyptian vessels of the same material or direct importations from the Nile Valley. The occurrence of the twelfth dynasty scarabs is of great interest, not only as showing that the connection between Crete and Egypt goes back, approximately, to 2500 B.C., but as solving one of the most vexed questions in the history of European art. These scarabs present in its highest form of development—but several centuries before the date of the great days of Mycenae—a form of spiral decoration which is essentially the same as that of the Mycenaean jewels. Stone objects exhibiting the same form of decoration in a more primitive style have, however, already been found in the Aegean Islands, and here, in these Cretan deposits, stones of this early island style that precedes the Mycenaean occur side by side with twelfth-dynasty scarabs that supply the obvious model of their spiralliform designs. The later history of this decorative system cannot be touched on here. Carried in the wake of the early amber trade to the North Sea shores, adopted as a principal feature of ornament by the Bronze Age populations from Hungary to Denmark, the same spiralliform system was introduced into Britain by the Belgic conquerors and finally survived in early Irish art. These Cretan finds supply the missing link between the scrollwork of the Book of Durrow or the font of Deerhurst and the royal scarabs of Amenemhat I.

ST. NICHOLAS TOWER, NEWCASTLE-ON-TYNE.

THE following report by Messrs. Oliver & Leeson, architects, on the condition of the tower and lantern of St. Nicholas Cathedral has been forwarded to the finance committee of the Newcastle Corporation:—In accordance with your request, we have carefully examined the tower and lantern of St. Nicholas, and beg to report as follows. We find that the whole of the structure above the level of the lead-flat is in need of immediate repair. The cement which has been plastered over the stone and ironwork, principally round the octagonal corner pinnacles, has in places become detached, leaving the joints and ironwork exposed to the weather. The moulded string-course below the battlements has many of its vertical

joints open. In the battlements the beds of the coping-stones have in two or three places been disturbed, and where the iron ties, which bind the corners of the tower together, cross the battlements, some of the stones have been split by the corrosion of the iron. The small turrets and pinnacles in the centre of each side of the tower are in fair repair, and, with the exception of the pointing in one or two places, require little or nothing doing to them. The large turrets and pinnacles at the angles of the tower are, on the contrary, very much in need of repair and pointing. It is round these turrets that the iron ties used to bind the top of the tower together are fixed; the expansion and contraction of these ties, and the corrosion, have caused a good deal of dilapidation. Two of the vanes from the westernmost of the corner spires have been taken down, and some of the remainder are not in satisfactory condition.

The iron ties and wood beams which have been fixed across the tower at different times to strengthen it are, especially as far as the latter are concerned, much decayed. One end of one of the wood beams is very bad indeed. The iron ties have originally been wrapped with spun yarn coated with tar. If this covering had been regularly seen to and properly repaired, it would have been a protection to the ironwork; as it is, it has been neglected for years, the tar has all worn off, and the yarn only serves to keep the damp as long as possible round the ironwork, thus causing greater corrosion. The arches springing from the turrets and carrying the lantern appear to be in very fair condition, and, with one or two slight exceptions, need no repairs. One of the small flying buttresses which spring from these arches to the turrets at the corners of the towers is in a defective state. It has been coated with cement, and has an iron tie built in. As in other cases, the corrosion of the ironwork has thrown the cement off. In the lantern itself the most serious dilapidation is apparent. The iron saddle-bars, which have been used to tie in the mullions, have, by their corrosion, burst the mullions in two or three places. The piece of stone burst off and a portion of the saddle-bar are submitted herewith. This splitting away of the stone has left the upper portion of the mullion and the tracery above in an insecure condition, and steps should be immediately taken to restore the damaged portions of the work. We have ordered some battens to be temporarily lashed to the mullions to keep them in their place. The whole of the lantern requires pointing and thoroughly overhauling, especially where ironwork has been built into the stone.

We have not been able to reach the upper part of the lantern and spire, but will do so when further ladders and scaffolding are erected, and will then report to you as to the condition of this portion of the building. The cause of a considerable amount of the present dilapidation is without doubt the expansion and contraction and the corrosion of the ironwork which has been freely used to tie the structure together. This should have been periodically inspected and kept in good repair. We were on the tower when the bells were rung on Wednesday, and noticed a considerable, though not excessive, amount of vibration. The heaviest bell of all, however, was not being rung. Before giving a definite opinion as to the effect of the vibration upon the lantern, we should like to have the whole of the bells rung when the scaffolding is erected, and more careful observations can be taken at the top of the lantern and spire. We are of opinion, however, that in the present condition of the lantern the ringing of the bells should be avoided, because, as we have already pointed out, some of the mullions are loose, and anything in the nature of vibration must have a detrimental effect.

It seems to us that the following repairs should be commenced forthwith:—The vertical joints of the string below the battlements should be carefully grouted and repointed in cement. The coping-stones of the battlements, where disturbed, should be taken off, copper dowels inserted and the stones reset. All stones that have been split or injured by the corrosion of the iron ties should be taken out and replaced by new ones. The small turrets and pinnacles should be pointed, and the large turrets and pinnacles should have the cement which is peeling off removed, and all the beds and joints grouted and pointed in cement. The two damaged vanes should be restored, and all other vanes carefully examined and put into proper condition. This would probably involve the taking down and resetting of some of the stonework. All the ironwork used in the structure should be thoroughly cleaned and coated with the best anti-corrosive liquid. The small flying buttress between the main arch and the corner tower should be taken out and new stones put in, as has been done in the other three cases. We would advise that the whole of the mullions and transoms in the lantern be taken out, and the iron saddle-bars and straps removed; that the stonework be reused as far as possible, new stones being used to replace the damaged ones, and all the saddle-bars and ties be replaced by copper. The lead on the top of the tower also requires certain repairs. We would suggest that your committee should authorise us to arrange for Mr. Walter Scott to commence the work forthwith on a schedule of prices being agreed to.

BIRMINGHAM SCHOOL OF ART.

THE Birmingham Museum and School of Art Committee have issued the programme for the coming session, which will begin on Monday, September 10. At the central school morning, afternoon and evening classes are held on five days a week, and the course of instruction includes drawing, design, painting, modelling, architecture and the execution of designs in *repoussé* and kindred processes, *e.g.* niello, chasing, etching and engraving on metal, damascening and filigree; enamelling—*cloisonné*, *champlevé* and Limoges; wood and stone-carving, drawing for book illustrations, wood-engraving, embroidery and other needlework, terra-cotta, silver-casting, die-sinking, encaustic painting, leather-work, the making of decorative cartoons, working in fresco, gesso, tempera, oils, sgraffito, lithography, &c.; building construction and drawing, machine construction and drawing, the steam-engine, applied mechanics and geometry. Mr. W. H. Bidlake, M.A., the special lecturer on architectural history and design in building, will in future teach at the school on Thursday evening as well as on Wednesday, and Mr. Naughtin has accepted the teachership of certain technical processes connected with the special course for house-painters and decorators. Messrs. Docker Brothers have offered prizes of the total value of 20*l.* to students attending this course. Alderman Cook, Mr. Thomas Cond, and Messrs. Hukin and Heath continue their offer of prizes respectively for machine drawing, anatomical studies and *repoussé*. The general prize list, some of the syllabuses of lectures and some of the conditions for the award of scholarships have been revised. The programme contains the new minute of the Department of Science and Art as to the examination of designs executed in the respective materials for which they are intended. During the session Dr. Windle will give a special course of five lectures on comparative anatomy; Mr. Whitworth Wallis, F.S.A., a course of three lectures on "Sicily and its Art Remains," and Mr. C. J. Hart will lecture on "Old Chests." Mr. W. J. Wainwright, A.R.W.S., will distribute the prizes and address the students in February next. Several rearrangements have been made with regard to the branch schools. Detailed in the programme are the arrangements made with the Jewellers and Silversmiths' Association in reference to the admission and attendance of students at the Vittoria Street branch school. The Bloomsbury branch school of Art has been transferred from the Board school in Cromwell Street to that in Lingard Street. Branch schools will next session be held on five evenings a week at the Board schools in Balsall Heath (Tindal Street), Clark Street (Ladywood), Cowper Street (Newton Row), Dudley Road, Ellen Street (Brookfields), Harborne (High Street), Hope Street, Jenkins Street (Small Heath), Lingard Street (Bloomsbury), Moseley Road, Saltley (Highfield Road), Smith Street (Hockley) and at the special building in Vittoria Street.

TESSERÆ.

Gothic Doors and Windows.

IN Gothic doorways the side splays and the arch or arch-mouldings above may be enlarged or increased to almost any extent, and that without producing heaviness or looking like exaggerated decoration. In many instances the width of the splays or dressings around the opening is equal to the width of the opening itself; and in some the former even exceeds the latter. And this breadth of splay, it should be observed, constitutes a marked distinction between doors and windows in the Gothic style; for though the apertures of both kinds strongly resemble each other in general shape and design, the latter do not admit, under any circumstances, of anything like a similar enlargement of their external dressings. Never is a small window attempted to be made a principal and ornamental feature by means of a deep splay filled in with decorations; never is a large one placed within a wide and deeply-recessed splay, bearing the same proportion to the aperture as the respective parts of a doorway generally do to each other. Nor is such difference of treatment—so fortunate in itself, inasmuch as it conduces to æsthetic variety—a merely arbitrary one, but is dictated by sound architectural propriety; for a Gothic window is not a mere gap in the wall, standing in need of external dressings to render it an ornamental feature; on the contrary it furnishes its own decoration, and the larger the window the more numerous the mullions and the more complex the tracery; consequently, all the more rich the design of the window. Another difference between Gothic doorways and windows is, that in the former the doors themselves are sometimes square-headed, the apertures being carried up only to the spring of the arch, in which case the tympanum, or space between the opening and the arch, is usually filled in with sculpture. A third difference between doors and windows—at least to doors in the Perpendicular style—is that for the doors the general design is formed into a square-headed composition and surrounded in its upper part by a series of external weather-

mouldings termed a label, and although labels are a very general, not to say universal, accompaniment to windows in the Tudor or Perpendicular Domestic style, they are almost unknown for large windows with a head formed by a single arch.

Newgate Prison.

George Dance, the younger, was not only trained up to architecture as a pursuit in which a safe and certain career, if not a brilliant one, was opened for him: he had applied himself to the study of it with a diligence exceeding what was required by the routine of that day, and he further possessed both a natural and cultivated taste for the fine arts generally, poetry included. He certainly stamped something of poetry as well as energetic character on the very first public work he executed; nor had he long to wait for the opportunity by which he signalled himself, for Newgate, that "proudest of prisons," was begun by him in 1770. This structure, one of the few truly monumental pieces of architecture in the Metropolis, has been chiefly extolled for its striking degree of character; yet it surely requires no very great ability to make an edifice of so peculiar a class express its purpose so clearly that it cannot possibly be mistaken for any other than what it is. Newgate might have been equally prisonlike in aspect had it been merely a dismal mass, utterly devoid of all æsthetic charm; it was by conferring upon it the latter—by breaking up the monotony of such a mass so as not at all to disturb unity, but enhance it—not to dissipate parts into littleness, but blend and condense them into one impressive whole—that Dance showed himself a great artist—let us say, a great tragic architect. The mode of treatment adopted by him might in less able hands have only weakened the expression aimed at, whereas here it renders it all the more energetic and the more intense. Truly felicitous is the manner in which, by being divided into boldly distinct and well-articulated parts, the composition acquires artistic play without losing anything of its severity. Truly felicitous also the effective relief both as to perspective and light and shade thrown into it, not according to the usual practice of bringing parts forward, but of recessing them, and placing masses in the rear of others, so that the general line of front is preserved unbroken in its lower part. The great drawback on this otherwise masterly composition is the centre compartment, or "governor's house." Well intended as is the kind of contrast between that part and the rest, the contrast actually produced is far from the happiest, the character given to the centre being somewhat prosaic and insignificant—by far too much like that of an ordinary dwelling-house, the windows being so many, in proportion to the space they occupy, as absolutely to crowd it and cut it up, to destroy breadth and repose, and to occasion an air of littleness; whereas, had there been only three windows on a floor, instead of five, the effect would have been incomparably better externally, and probably without the slightest inconvenience as regards internal plan. At all events the attic storey is a sad blemish, a most paltry termination to the centre of such a pile; but we believe we may vindicate Dance from the reproach of it, because not only does it look like an addition to the building, but really seems to have been an after and most unlucky alteration, since some prints of it represent the centre of the edifice crowned by a pediment, which gives variety to the whole composition without any sacrifice of dignity. If it was Dance himself who was afterwards complaisant enough to mar his own work, in order to provide an additional storey that might just as well have been concealed within the roof, very little is the pity we have to bestow upon him.

Ætïon the Greek Painter.

According to Lucian, Ætïon, Apelles, Euphranor and Polygnotus were the most successful of the ancient Greek painters in the mixing and laying on of colours. Ætïon's exact time is uncertain, although from the manner in which he is mentioned by Lucian, notwithstanding the names he is associated with, he lived probably in Lucian's own time, or at most very shortly before him. He speaks of him as the most distinguished painter of his time, and describes a very celebrated picture by him of the marriage of Alexander and Roxana, which the painter exhibited at the Olympic games, and which pleased Proxénidas, one of the judges, so much that he gave Ætïon his daughter in marriage. "It may be asked," says Lucian, "what was there so marvellous in that painting as should induce a man of such high rank to reward the painter, who withal was a stranger, by bestowing on him his daughter? The picture is still in Italy, and I am able to speak of it from personal inspection. It represents an extremely magnificent bedchamber with a nuptial bed. In it is seen sitting Roxana, the most beautiful virgin that can be conceived. Her eyes are modestly fixed on the ground before Alexander, standing near her. She is surrounded by several smiling Cupids. One of them behind her lifts up the bridal veil from her forehead and shows it to the bridegroom. Another, in the attitude of a slave, is officiously employed in drawing off her shoes, that she may no longer be detained from lying down. A third has hold of

Alexander's robe, pulling him with all his might towards Roxana. The king presents the maiden with a crown, and beside him stands Hephæstion as a bridegroom, holding a lighted torch in his hand, supported by a wonderfully fine youth, whom I guess to represent the god of marriage, for the name is not beneath. On the other side of the piece are drawn several more Cupids, playing with the arms of Alexander. Two of them carry his spear, and seem almost overburdened with the weight of it. Another couple take his buckler, with a figure like the king stretched upon it, trailing it along by the handles. Another creeps backwards into the coat of mail, where he seems to lurk in order to frighten the two little porters as they come on." "These collateral incidents," continues Lucian, "are by no means the mere wantonness and idle sport of the artist's fancy; they are to show the martial disposition of the bridegroom, and that his love for Roxana had not effaced his passion for arms and military glory." From this description Raphael is said to have made a design, of which there are duplicates or copies, and it was executed in fresco in the so-called Villa of Raphael, in the garden of the Villa Borghese at Rome; but the composition is puerile, and does not at all merit the praises which Lucian has given to the ancient performance of Ætïon. Lucian in the above description remarks that he guesses a fine youth to represent the god of marriage, as the name is not beneath. He alludes to an ancient custom which prevailed among the Greeks of attaching the names in their pictures to the figures represented; the names in most cases were probably written below the feet of the figure. In the pictures on vases we find the name sometimes written by the side of the picture, but the practice was not universal. In this case, from Lucian's remark it would seem that some of the figures had names attached to them, as he speaks of the other characters with certainty, and guesses only at the god of marriage, because there was no name attached. It was a practice, however, seldom if at all had recourse to in later times, and in case of its employment the name was probably so placed as not to disturb the pictorial effect. Sometimes sentences were inscribed on pictures, as, for instance, Zeuxis wrote upon his picture of Helen three lines from Homer, celebrating her extraordinary beauty. There are similar examples on works of the Middle Ages and also of much later times; inscriptions below allegories are very common. The circumstance that Pliny has not mentioned Ætïon is an additional reason for concluding that he lived about Lucian's own time, or in the early half of the second century of our era, subsequent to Pliny. Some, however, have supposed that the Echion of Pliny and Cicero is the Ætïon of Lucian, especially as the former was celebrated for a picture of a bride distinguished for the modesty of her expression; but this implies a great blunder in Lucian, who speaks of him as a painter of his own time, and there is no sufficient reason for such a supposition.

Roman and Greek Lineal Measurements.

The Roman foot has been determined in the following ways:—(1) By feet laid on sepulchral monuments; (2) by foot-rules obtained in the ruins of Rome and elsewhere; (3) by the distance of mile-stones; (4) by the distance of places; (5) by specimens of the congius; (6) by some obelisks; (7) by the dimensions of buildings. The method of ascertaining the foot by buildings is as follows:—Any remarkable length, such as that of the whole front of a building, being known nearly in Roman feet, is presumed to be exactly that number of feet which it must be nearly. This supposes that the Roman architects were in the habit of choosing exact numbers of feet when there was no particular reason for breaking a foot. Raper proceeds in the manner of which the following is an instance:—He finds the distances between the columns in the Temple of Fortuna Virilis to be 97106 English feet. If this be an exact number of Roman feet, it must be 10; we know enough beforehand of the Roman foot to say it cannot be 9 or 11. Consequently, if the distance between these columns be a whole number of feet, the foot must be 97106 of the English foot. By processes of this sort, Greaves found 131.50 lines, La Hire 131.0 and 132.4, La Condamine 130.9, Jacquier 131.08 and 131.14. Raper, who went more into this subject than the others, found by different buildings 131.14, 131.60, 131.62, 131.11, 131.16, 131.05, 131.16, 131.05 and 131.15 for the mean. Wurm, from the Vienna amphitheatre, adds 131.12. Raper thought he observed that the buildings subsequent to the time of Titus give a shorter foot than their predecessors. From instances he gets 130.75, 130.33, 130.34, with a mean of 130.34. He refers the change to the destruction of the Capitol (where the standards were kept) in the time of Vitellius. From all these data Raper's average, adopted by Wurm, is 131.15 French lines for the ancient foot, or 11.648 English inches, or 971 English feet. But Sir G. Shuckburgh made a careful review of the three best modes of obtaining the required result, namely, rules, buildings and tombs, and obtained .9672, .9681, .9696 of a foot English. The mean of these is .9683 feet, or 11.6196 inches. Again, if we take a mean of the results given by others, namely, Bernard .970, Picard

and Greaves '967, Folkes '966, Raper '970, we have also '9683. We take then the Roman foot at 11.62 English inches, which is represented far within the probable limits of error by the following:—61 English feet make 63 Roman feet. Eminent authorities of late years prefer 11.65 inches for the Roman foot, but we like to keep as near to the foot-rules as we can, consistently with giving due weight to other modes. Indeed, the question between 11.62 and 11.65 cannot be settled by authority, but must be decided by closer appreciation than has yet been made of the probabilities of the different methods. We have not now any means of knowing whether the fundamental points of connection between the Greek and Roman measures are exact or only approximate. These are, that the foot is longer than the Roman by one twenty-fourth, and the Philetærian foot by one-fifth, that the *μετροπυς* is an amphora and a half, and that the amphora of water or wine weighs an attic talent. Taking these relations for granted, we have for the Greek foot 12.10 English inches or 1.008 feet, for the Philetærian foot 13.94 inches, for the metretes 8.4879 gallons, and for the attic talent 56.586 lbs. avoirdupois. There is one stadium left at Athens which is 630 English feet, giving for the Greek foot 1.05 feet English, but there is not much dependence to be placed on the measure. Such buildings as have been examined at Athens, in the manner already described, given as a mean 136.69 Paris lines, or 12.14 English inches. We may, therefore, say that the Greek foot was longer than the English one by the tenth part of an inch. The statements then as to the relations between the Greek and Roman measures appear to have been tolerably exact, and our knowledge of the relations between our measures and theirs, though not sufficient for scientific comparison, is abundantly exact for the purposes of the classical student, far more so than could have been expected to have been attainable by those who remember that for a long period all means of comparison were lost.

Percier and Fontaine.

The names of Charles Percier and Pierre François Louis Fontaine are so intimately associated that the reputation of the one is inseparable from that of the other, for both their buildings and their publications were the productions of their joint talent. Percier, whose father was a colonel of dragoons, was born at Paris on August 22, 1764, and had for his first instructor in art Poirson, who was no more than a mere water-colour draughtsman. In 1783 he entered the school of Peyre, and afterwards studied under the elder Gisors, another architect of repute, and having obtained the prize for a project for a Jardin des Plantes in 1786, he went to Rome, where he was at first quite overwhelmed and perplexed by the multiplicity of buildings and other objects of art that all at once solicited his study. It was at Rome that his friendship and connection with Fontaine commenced, and there he also became acquainted with Flaxman, Canova and other artists who afterwards rose to eminence. During their residence in that city Percier and Fontaine made the drawings which form the subjects of their first publication, viz. "Palais, Maisons, et autres Edifices modernes, dessinés à Rome," Paris, 1798, a folio with 100 plates beautifully delineated and engraved in outline. In the interim, and for a while after their return, they had to contend with necessities and difficulties for a subsistence: the agitated state of public affairs was most unpropitious to their profession, more especially to beginners in it; they were therefore fain to provide for their actual subsistence by making designs for various articles of ornamental manufacture and furniture. The careful study and superior taste displayed by them rescued them from the obscurity to which they seemed doomed by bringing their talents in some degree before the public. Various decorations executed by them at Malmaison for the First Consul and Madame Bonaparte secured for them the powerful patronage of the Emperor Napoleon, and almost immediately after the commencement of his reign they were employed to restore, complete and embellish the two palaces of the Tuileries and the Louvre, of which latter more especially, the very extensive, numerous and complicated works fully occupied them for a series of years extending to some time after the restoration of the Bourbons. This accounts for their having, with all their high reputation, been employed on so few buildings, and flattering and favourable as it was it was not wholly without drawback, because they could not lay claim to those edifices as their own architectural creations, and their fame in them merged in the renown of their original authors. One distinct work of theirs is the arch in the Place du Carrousel, and such also are the ground staircase and other separate portions of the interior of the Louvre. The chief other monument by them is the Chapelle Expiatoire, erected after the Restoration in memory of Louis XVI. The line of houses called the Rue Rivoli adds little to their professional fame, it being no more than a handsome and regular piece of street architecture. For the general celebrity attached to their names Percier and his colleague are perhaps after all mainly indebted to their

publications, and not least of all to that entitled "Recueil de Décorations Intérieures, contenant tout ce qui a rapport à l'Ameublement," folio, Paris, 1812, a collection of designs for rooms and various articles of furniture in the ultra-classic style of embellishment that was affected in France at the beginning of the century, but which was so entirely matter of mere fashion that Percier lived to see it pass away. Another publication brought out by them about the same time was the "Choix des plus belles Maisons de Plaisance de Rome et ses Environs," a series not of strictly architectural studies, but pictorial views of Roman villas and their gardens. To these may be added two magnificent graphic works, one of them recording the ceremonies and pomps at Napoleon's coronation, the other those which took place on his marriage with Marie Louise. Besides these there is another work attributed to Percier, but which does not appear to have got into public circulation, "Parallèle entre plusieurs Résidences de Souverains de France, d'Allemagne, de Suède, de Russie, et d'Italie," Paris, 1833, with thirty-eight plates.

The Viking's Home.

In Iceland, in the tenth century, there were no towns in the Mediæval sense, nor perhaps in modern Iceland is there any aggregate of wood or stone which can, except by courtesy, be called a town. Such herding together has always been repugnant to the free disposition of the people; and when Iceland was a republic, one might as well have expected one hundred bulls to have been shut up together in a pound without using their horns, as to have seen the same number of heads of families living peaceably together, house touching house. In another sense there were towns; there were *túnir*, pronounced as the Scots pronounce their town, and by which they sometimes mean the same thing. Etymologically speaking, a town is an enclosed space—a field with a wall or fence round it. In such a town every Icelandic house stood; it was merely the field which surrounded the homestead, and which was immediately under the master's eye. As for the building itself, it was invariably of wood, with several gables—often as many as seven. Sometimes the farm-buildings (the *byre*, as they call it across the border) touched the main building; sometimes it was a separate erection, but it was always near. The Icelandic word for this was "*fjös*." The house itself seems rather to have grown together out of a number of houses than to be one house. The following at least were some of the main features of such a building. First there was a porch (*utihúrd*), an entrance in which there were double doors. This was in the centre, under the main gable, and led into a passage. On the left, as one went in, there was a bath-room, in which the inmates often took warm baths; their cold baths were the river or the sea. Out of the bath-house, on the left, was a door which led into the kitchen (*eldhús*), which sometimes had an entrance of its own from the town; out of the kitchen, still on the left, was the store-room (*skemma*). The whole house appears to have been what we call single, and each of these apartments ran its entire depth. Thus, then, on the left of the passage were what may be termed the offices. On the right of the passage was a door which led into a room which answered to the hall in an old English house; it was called the *skáli*, and was the state-room of the family. Here was the master's high seat, supported on either side by those pillars or columns of which one has heard so much. The seat itself was called *öudvegi* and the pillars *öudvegissúlur*. As a visitor entered by a side-door out of the passage and turned right about, this high seat faced him. Down the whole length of the hall ran a double row of tables and benches, at which the guests sat in order of honour, reckoned from their nearness to the master, and many an Icelandic brawl or feud arose out of quarrels for precedence on the festive occasions. Down the whole length of the hall, too, on such feasts, when the weather required it, were fires (*lángeldar*). Over the high seats, but sometimes, it would seem, at the other end of the hall, was a raised gallery or stage (*palli* or *thverpalli*), the special place for the women, who sat on it in solemn state on bridal feasts, occasions when all the formality and hospitality of the establishment were brought into full play. Sometimes there seems to have been a second high seat, lower and of smaller dimensions, opposite to that on which the master sat. In great establishments the *skáli* was hung with tapestry or woven hangings, the gift of kings or the spoil of piracy. Off the hall, on the right, was the sleeping-chamber (*svefuhús*), a spacious apartment in which let no delicate eyes be shocked to read that the whole family slept. Next to the sleeping-chamber, with its cribs, was sometimes added a smithy or workshop, where the handy master repaired his arms and his tools, forged spears and arrow-heads, fitted them to their shafts, and did a hundred things which are now handed over to the carpenter, the blacksmith, or the armourer, but which were then not thought below the dignity of the freeman. Thus, with its seven gates, over-storehouse, kitchen, bath-room, passage, hall, bedroom and workshop, the Icelandic house stands before one.

NOTES AND COMMENTS.

THE proposed Museum of Antiquities at Cairo, for which all the architects of the world can compete, is to have a frontage of about 600 feet. The site is approached by avenues, and will allow an open space of about 100 feet in front of the building. As the perfect condition of most of the Egyptian antiquities is in a great measure owing to the dry condition of the places where they were found, it is expected that means will be taken to prevent dampness throughout the building. For that reason the lower floor is to be raised from 6 feet to 10 feet above the level of the ground. As it is assumed that a weight of $28\frac{1}{2}$ lbs. per square inch, or 4,104 lbs. per square foot, will come upon the site, precautions must be taken to avoid settlements. The floors are to be fireproof, and constructed of steel or iron with cement, the upper surface being mosaic. The ground floor will be used for the exhibition of large and heavy works, which may be assumed to weigh 1,230 lbs. per square foot. Some courts will have to measure 40 feet wide, with a height of 30 feet, while others will be 19 feet wide and 20 feet high. On the second floor smaller objects will be exhibited, and the weight to be carried can be taken at 150 lbs. per square foot. It is expected that the ventilation will be effective, while dust is excluded. The first prize will be of the value of 620*l*. The designs are to be lodged in the Office of Public Works, Cairo, not later than March 1, 1895. All the premiated designs are to become the property of the Egyptian Government, and it is not guaranteed that any of them will be carried out. But if the author of the first design should be invited to take the direction of the works, the premium is to be merged in the commission.

It is a good stroke of policy to declare that the Paris Exhibition of 1900 cannot be a success unless there is an underground railway to convey the multitudes to the Champ de Mars. Sightseers usually prefer to travel by routes which are not subterranean, but six years hence they may have a preference for darkness. Hitherto all the efforts to start a metropolitan system in Paris have been fruitless; it remains to be seen whether the desire to attract strangers to Paris in 1900 cannot overcome the prejudices which, up to the present, have been invincible. M. LOUIS BARTHO, the French Minister of Public Works, will be able to make out a good case in favour of the project. He has spent a week examining the English and Scottish systems. Two days were devoted to the underground and electric railways of the Metropolis. At Liverpool he journeyed by the overhead line and through the Mersey Tunnel. He also investigated the Glasgow system. M. BARTHO can claim to be the first French Minister who adopted so efficacious a method of acquiring knowledge, and his travel's history will probably be convincing. The omnibus and voiture companies are, however, most influential in the French Chamber, and will not succumb without a struggle.

VIGOROUS efforts have been made during late years to make Glasgow a healthy city, but the statistics which were presented by the chairman of the Sanitary Congress last week reveal how much has yet to be overcome by philanthropists. Eighteen per cent. of the population continue to be doomed to dwell in one-roomed "houses." The average rent of these dwellings is 8*s*. a month, but some can be obtained for 5*s*. 6*d*. There are "farmers" who make a specialty of providing accommodation for the poorest classes. They take rooms at a rate of about 5*s*. a month, place a little furniture in them, and can let them for 4*s*. or 5*s*. a week. After all deductions are made the profit is at a higher rate than in most commercial enterprises. This mode of obtaining shelter is accepted as inevitable, and it is so well established, stringent measures will be required to deal with it. Mr. CRAWFORD considers that all houses which have not an area of 900 cubic feet should be closed, and that some check should be placed on their erection. Every house, he said, let for hire should be permanently guaranteed by the act of hiring as a house fit for healthy occupation, and it should be the business of the proprietor to regulate the behaviour of his tenants and the use of his property so that it could not become a source of danger to the public. The obstacle to an efficient mode of dealing with the difficulty in Glasgow and other cities is

the apprehension of the suffering which will be caused by its operation. What is to become of the miserable tenants if they are driven out of the wynds and alleys? In many cases it would be possible for the people to live in better rooms if they were less anxious to aid brewers and distillers in their efforts to gain peerages through wealth, but how are they to be convinced of that fact?

SCOTLAND has its Alpine clubs, and we suppose subjects for study and opportunities for climbing can be found by the members without the pains of crossing half of Europe. On Saturday the Innerleithen Club visited the Manor Valley and had the satisfaction of hearing Professor GEIKIE explain hills and valleys which are to be seen as well as those which had vanished. He also pointed out one of the costly failures which seem to be inevitable before the earth's surface can be profitably turned to account. Every geological professor begins a course by referring to them, and if the chance were given to him he would be sure to add to the list. The Manor Valley affords an example, for at Posso the Edinburgh Water Trust spent much time and money in vainly seeking for a foundation for the embankment which was to convert the upper valley into a huge reservoir to supply Edinburgh with water. The cause of the failure arose out of the great glaciers that had passed over the region. The roundness of the hills was evidence of the erosion, and there was an immense denudation. The whole of the valley bottom was consequently paved with boulder clay. That was the ground moraine laid down by the action of the ice. Possowood-hill, rising up in the middle, had been an obstacle to the progress of the glaciers, and there terrible erosion had taken place. The ice had scoured and ground to a great depth around the base of the hill before passing to each side of it, and it had left there an immense hollow and a vast amount of material in its retreat. That was why the engineers of the Water Trust had not got rock when they went to bore there. They were boring into a hollow that was ground out by the ice to a depth of about 350 feet. The ice had hollowed out the rock basin, just as a rushing stream hollowed out a basin in front of a rock that blocked its passage. After these moraines had been laid down there came more genial conditions, and the ice disappeared. Another period of cold followed, less severe, when the higher hills were covered with snow. This gave rise to smaller glaciers which came down the valleys, and as they melted there they dropped the *débris* they carried down, giving rise to terminal moraines. The Edinburgh Trust, we presume, were guided by the advice of geologists, but often it is not easy to determine the geological character of a place until a large region around is examined. When the Geological Survey is completed—if that day ever arrives, for there are continual changes in assigning districts to formations—misadventures like the one near Possowood-hill will become more rare.

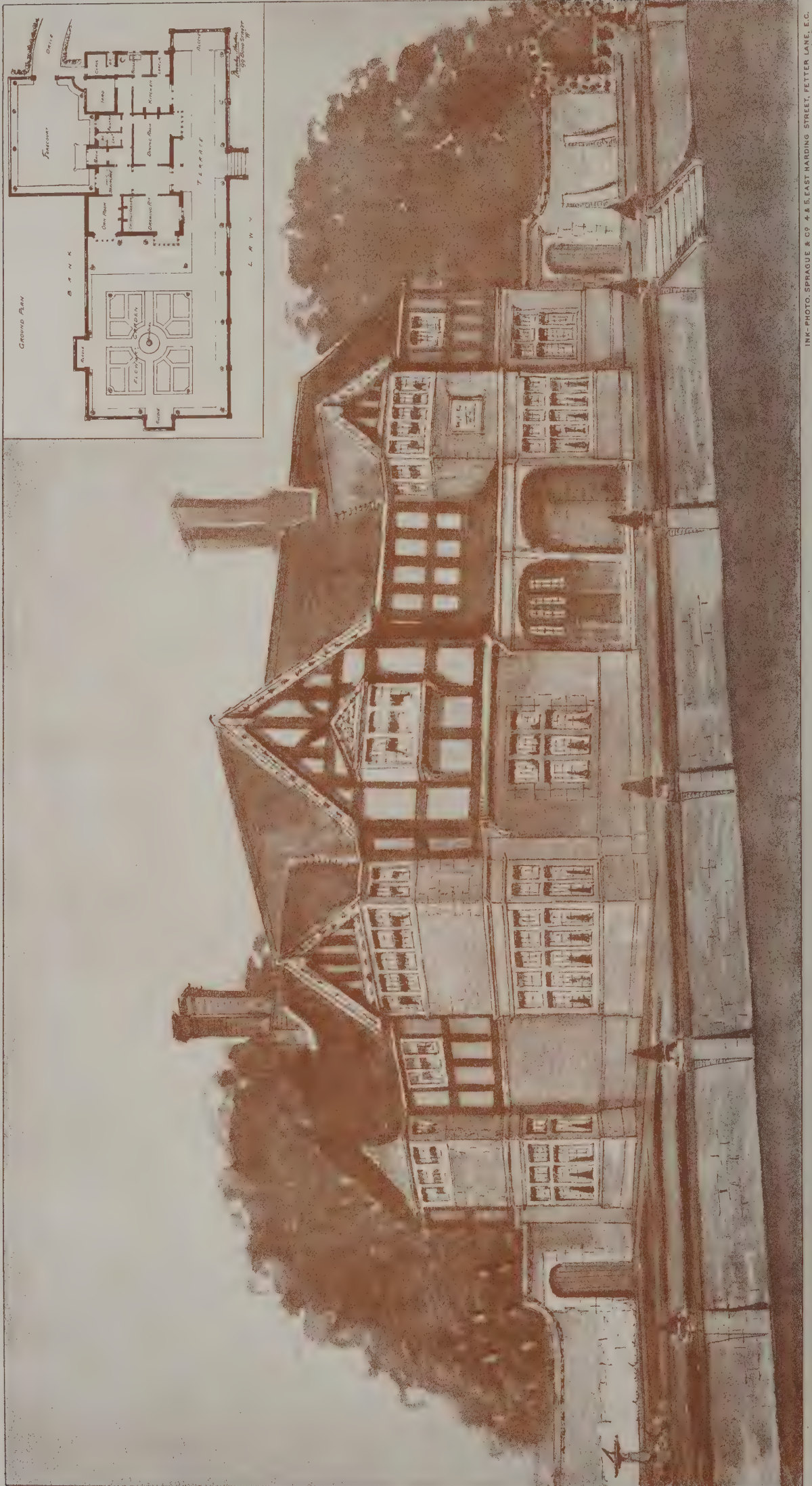
THE condition of Heidelberg Castle is not likely to be forgotten by any visitor to the ruins. The injury which buildings suffer under the attacks of soldiers appears magnified there on account of the large number of statues which were deprived of heads and limbs during the siege. From the position of the building in a lovely landscape, the desolation seems to be intensified. It is true the structure has become a record of the lengths to which the Palatinate war was carried; but the crowds who visit Heidelberg would gladly trust to evidence of another sort. From time to time, therefore, projects for restoring the Schloss are announced. But the work would be very costly, and on that account it has not been commenced. A partial attempt is about to be tried. It is proposed to make an experiment with the sculpture. In the course of next month a commission of experts will meet to consider the subject. The members include such architects and building directors as Professors DURM, WARTH, KIRCHER, Herr SEITZ and Herr KOCH, the sculptors HEER, BINZ, WELTRING and others. They will have to determine whether the injured figures can be restored without any loss of character, or whether duplicates should not be executed and set up in the niches. Experiments will, of course, be made, and the recommendations of the commission will be subjected to the scrutiny of the numerous lovers of Heidelberg.

· London & South Western Bank ·
· Holloway ·

Mess^{rs} Truefitt & Watson · Architects ·
5, Bloomsbury Sq. W.C.





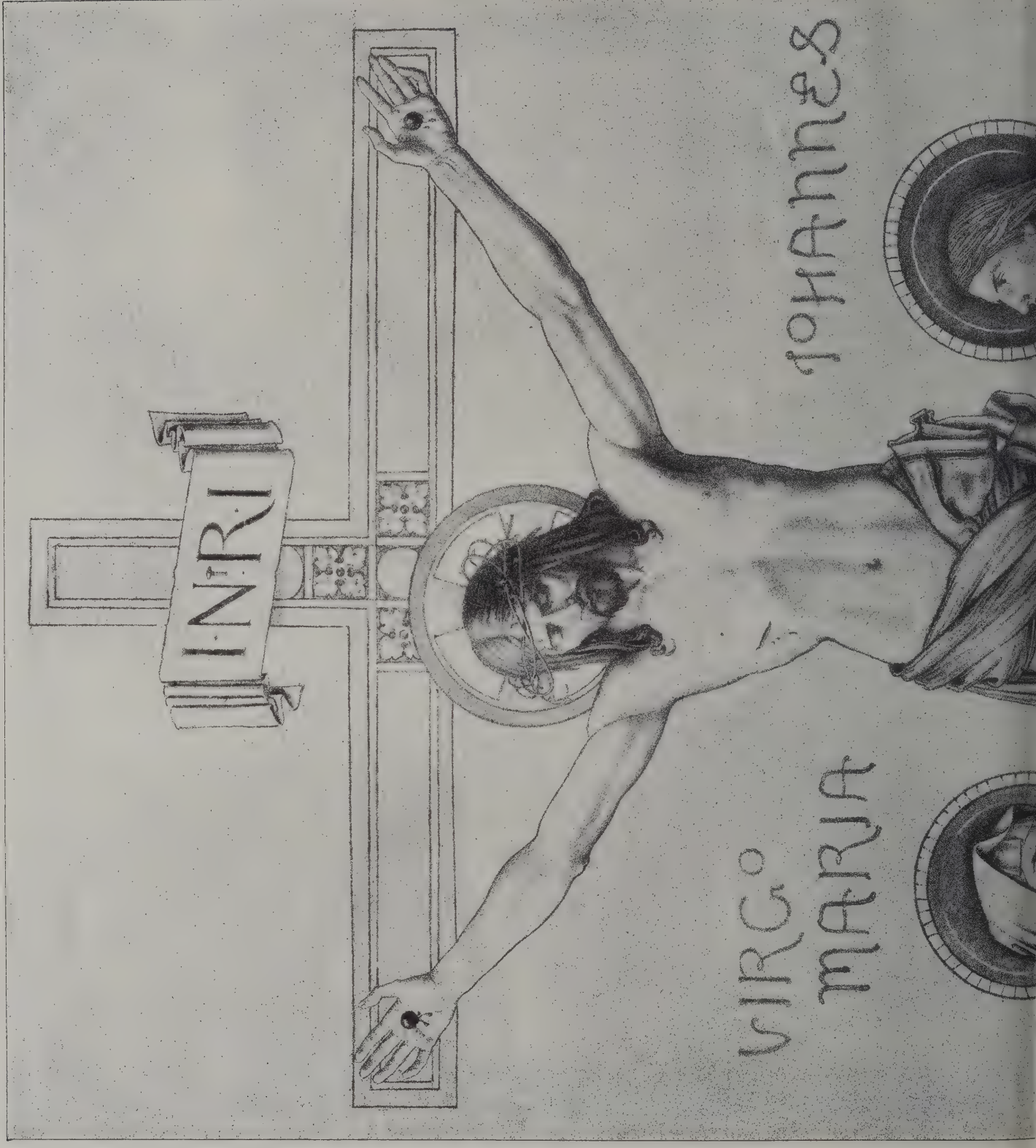


COTTAGE: BRIMSCOMBE, GLOS.
P. MORLEY HORDER, Architect.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

"GLEN LODGE," MIDLOTHIAN.
J. GRAHAM FAIRLEY, F.R.I.B.A., Architect.





INA PHOTO BRIDGUE & CO 43 EAST HARGREAVE STREET FETTER LANE EC

CHRIST ON THE CROSS, WITH THE VIRGIN MARY AND ST. JOHN.

ST. MARTIN'S CHURCH, DORKING.

Designed by G. WOOLLISCROFT RHEAD, from the sketch of Messrs. J. POWELL & SONS.

ILLUSTRATIONS.

LONDON AND SOUTH-WESTERN BANK, HOLLOWAY.

THESE branch premises, here illustrated from the drawing which appeared at this year's Royal Academy Exhibition, are now in course of erection on a most commanding site at the junction of the Holloway and Parkhurst Roads, from the designs of Messrs. TRUEFITT & WATSON, architects, 5 Bloomsbury Square, W.C. White Mansfield stone has been used for the dressings to the main elevations. The ground floor is devoted to the banking business, and consists of a banking-chamber 30 feet square, with manager's-room, waiting-room, clerks'-room, &c., adjoining. The fittings throughout are in teak. The strong-rooms and lavatories occupy the basement, and are fitted with iron grilles and fireproof doors, &c., supplied by the Milner Company. The upper floors of the building are arranged for the manager's residence. The one-storey building facing the Parkhurst Road consists of a spacious board-room, with waiting-room, lavatories, store-place and manager's private entrance. The contractors for the whole work are Messrs. WILKINSON BROTHERS, of Finsbury Park.

COTTAGE, BRIMSCOMBE, GLOS.

GLEN LODGE, MIDLOTHIAN.

THE CRUCIFIXION.

THE work which we illustrate forms the centre of three panels over the chancel arch of St. Martin's Church, Dorking, and is executed in Messrs. J. POWELL & SONS' "opus sectile," with mosaic background. The side panels, representing CHRIST bearing the Cross and the Entombment, yet remain to be done. The figures are over life-size. The artist is Mr. G. W. RHEAD.

THE NATIONAL PORTRAIT GALLERY.

IN last year's report the trustees of the National Portrait Gallery expressed a hope that the new gallery which is being erected at the cost of Mr. W. H. Alexander, or some portion of it, would be in working order by the following spring. These expectations, however, have not been realised. In explanation of the delay a letter was addressed to the Office of Works by Mr. Ewan Christian, the architect, dated March 16, 1894. He stated that after a consultation with Mr. Shillitoe he came to a conclusion that the whole of the main building could be properly finished in about nine months, and if required for preliminary use the south-east gallery could be handed over in one month, but if these rooms are not really wanted for use it would be preferable to wait a little longer. Mr. Christian had in a former report expressed his belief that the north building could be finished by the end of August, but the sudden and unexpected death of a principal assistant rendered a fresh calculation necessary. That caused some delay in the preparation of work which could not be safely hurried, and more time was therefore needed. Mr. Christian added:—"The work in the interior of the building has been progressing as fast as I think desirable; the windows have been purposely kept open during the whole winter with excellent results. With the exception of the principal staircase, which is not yet sufficiently dry, the plastering has been carried on in all storeys, and is now far advanced towards completion. All the boarding for the walls is in the galleries ready for fixing as soon as required, and the heating works are far advanced."

On June 14 of this year some of the trustees for the first time assembled within the walls of the new building. Mr. Christian explained the general architectural construction and disposition of the various apartments, and the uses designed for them on all the floors, together with arrangements for heating and ventilation. The trustees were impressed with the completeness with which every portion had been thought out, and the care with which all necessities had been provided for. The walls and flooring are fireproof, and the lighting in the principal galleries is excellent. Modern appliances and improvements have not been neglected, and wide staircases with lifts will facilitate both public and private access to all parts.

Although Mr. George Scharf, the director, has already devoted much of his time to considering the disposition and arrangement of the portraits on the new walls, and his plans are in a great measure matured, a considerable time must of necessity elapse between the reception of the portraits from Bethnal Green and other places of temporary deposit, and the thorough completion of the gallery for the admission of the public.

During the past year the collection received the following additions:—A copy of Woolner's bust of Tennyson, which was sculptured from life in 1857; a chalk drawing by Samuel Laurence of the late Earl of Derby; a bust by John Gibson, R.A., of Sir Charles Lock Eastlake, P.R.A.; a portrait of Lady Callcott, by Sir T. Lawrence, "the work of two hours, during the whole of which time Sir Charles Eastlake was present;" a medallion in plaster of the fifth Earl Stanhope, the first chairman of the board of trustees of the National Portrait Gallery; a water-colour half-length portrait of Henry Hunt, the reformer and orator; a second portrait, full length; a portrait of William Roscoe, the historian; a portrait of William of Nassau, the father of William III.; a portrait of Frederick of Bohemia, the son-in-law of James I., and grandfather of George I.; a portrait of Sir Peter Lely, painted by himself; a portrait on panel, by J. M. Wright, of Elizabeth Claypole, the second and favourite daughter of Oliver Cromwell; a portrait on mahogany of John Martin, the painter; an unfinished portrait of George Romney, the painter, by himself; a life-size portrait of Lord Chancellor Erskine, by Sir William Ross; a portrait of the first Lord Paget; and a portrait by Paul von Somer, of Sir Henry Spelman, the antiquary.

THE LATE HENRY FAIJA.

WE regret to announce the death on Tuesday, the 21st inst., of Mr. Henry Faija, M.Inst.C.E. He was the son of Mr. G. Faija, a popular artist and miniature painter to the Queen. He was born at Alfred Place, Bedford Square, W.C., in 1844, and educated at University College School. He was articled to the firm of Westwood, Baillie, Campbell & Co., shipbuilders, of the Isle of Dogs, E., but the firm failed before he had completed his articles. He then went north, and occupied important positions, first with Messrs. Hopper, of Hull, and afterwards with a firm of shipbuilders on the Tyne. After a brief partnership with a firm of engineers at Stoke-on-Trent, he came to London about 1870, and started practice as an engineer in John Street, Bedford Row. On obtaining a commission to design and erect some cement works, the rough-and-ready methods then in vogue impressed him with the vast field for improvement in that branch of industry, both from an engineering and scientific point of view. From that time he made a specialty of cement works, and thus commenced his career as an expert in all matters relating to cement and cement-making materials. He since designed and erected works for the production of cement in various parts of England and abroad, including Brazil and the United States, and also received applications to personally undertake work in South America and other places abroad, which his professional engagements in England prevented him from accepting.

About 1880 he removed to 4 Great Queen Street, Westminster, and there established a cement-testing room and chemical laboratory, where cement and cement-producing materials were examined and reported upon. The steady growth of this branch of his practice was an indication of how much his opinion was valued, and in 1888 he found it necessary to remove to larger premises.

Mr. Faija was a member of the principal engineering and learned societies, viz. the Institution of Civil Engineers, Institution of Mechanical Engineers (1869-89), British Association, Royal Institute of British Architects (honorary associate), Society of Arts and Society of Engineers, of which latter body he was vice-president at the time of his death, and but for his untimely removal would have succeeded to the chair in due course. He at various times contributed papers to the above societies on the subject of which he had made a special study, and was awarded premiums by the Society of Engineers for papers read before that body in 1888 and 1889. The latter papers were prepared with the object of combating the "magnesia" scare which occurred at that time owing to the Aberdeen failures, and conclusively proved that the supposed destructive effect of sea water on a properly manipulated cement concrete was a scare and nothing more. In 1881 he wrote a treatise entitled "Portland Cement for Users," which has since run through more than one edition, and is now included in Weale's series of scientific handbooks, and he was a frequent contributor to the leading professional papers. During a long experience Mr. Faija accumulated a vast amount of precise scientific data, based upon careful experiments with cements and cement-producing materials from all parts of the world. These experiments and tests have been made with instruments chiefly of his own invention, and the recorded results far exceed those of any other investigator in the same field of inquiry. Mr. Faija was specially invited by the American Society of Civil Engineers to communicate a paper on the subject at Chicago last year. The work of his office and laboratory has for some time past been carried out by Mr. Butler, who for many years has worked with Mr. Faija as his chief assistant, and who, by his express desire, will continue to carry on the business for the benefit of the family.

THE TRUE PRINCIPLES OF POINTED OR CHRISTIAN ARCHITECTURE.

By A. WELBY PUGIN.

(Concluded from page 125.)

I MUST here mention two great defects very common in modern Pointed buildings, both of which arise from the great fundamental principle of decorating utility not being understood. In the first place, many architects apply the details and minor features of the Pointed style to Classic masses and arrangements; they adhere scrupulously to the regularity and symmetry of the latter, while they attempt to disguise it by the mouldings and accessories of the former. They must have two of everything, one on each side; no matter if all the required accommodation is contained in one half of the design, a shell of another half must be built to keep up uniformity. What can be more absurd? Because a man has a real door to enter his house by on one side, he must have a mock one through which he cannot get in on the other. How inconsistent is it to make and glaze a window which is to be walled up *ab initio*. But to see the full absurdity of this system, let us only imagine the builders of the ancient colleges, after having finished a church and refectory on one side of a quadrangle, running up something to repeat them by way of a pendant on the other, so as to appear two churches and two dining-halls to one college. In the second place, when modern architects avoid this defect of regularity, they frequently fall into one equally great with regard to irregularity; I mean when a building is designed to be picturesque, by sticking as many ins and outs, ups and downs about it as possible. The picturesque effect of the ancient buildings results from the ingenious methods by which the old builders overcame local and constructive difficulties. An edifice which is arranged with the principal view of looking picturesque is sure to resemble an artificial waterfall or a made-up rock, which are generally so unnaturally natural as to appear ridiculous.

An architect should exhibit his skill by turning the difficulties which occur in raising an elevation from a convenient plan into so many picturesque beauties, and this constitutes the great difference between the principles of Classic and Pointed domestic architecture. In the former he would be compelled to devise expedients to conceal these irregularities, in the latter he has only to beautify them. But I am quite assured that all the irregularities that are so beautiful in ancient architecture are the result of certain necessary difficulties and were never purposely designed; for to make a building inconvenient for the sake of obtaining irregularity would be scarcely less ridiculous than preparing working drawings for a new ruin. But all these inconsistencies have arisen from this great error—the plans of buildings are designed to suit the elevation, instead of the elevation being made subservient to the plan.

Under the head of architectural propriety we have also to consider the scale and proportions of buildings. Without vast-

ness of dimensions it is impossible to produce a grand and imposing effect in architecture; still, unless these be regulated on true principles, they may destroy their effect by their very size; and here I wish to draw your attention to a point which will prove the great superiority of the Christian architecture of the Middle Ages over that of classic antiquity, or of the revived pagan style. In Pointed architecture the different details of the edifice are multiplied with the increased scale of the building; in Classic architecture they are only magnified.

To explain this more fully, if the Pointed architects had a buttress and pinnacle to erect against some vast structure, such as the cathedral of Cologne or Amiens, they did not merely increase its dimensions by gigantic water-tables, enormous crockets and a ponderous finial; no, they subdivided it into a cluster of

piers and pinnacles—they panelled the front, enriched it by subordinate divisions, and by these means the pinnacles of Cologne appear five times as large as those of an ordinary church,* which could never have been the case had

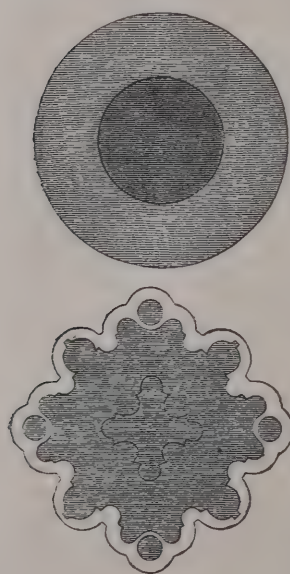
they only enlarged the scale instead of multiplying the parts. But the very reverse of this is the case in Classic architecture; a column or cornice is the same, great or small, whether they are employed in front of an ordinary house or of a vast temple. No distinction except that of size is ever made; there are the same number of diameters, the same number of mouldings, the same relative projections. It is merely a magnifying power applied to architecture. What is the result? Till you actually stand under these buildings, and find that your chin does not come up to the plinth at the base, you do not perceive the scale. This is perfectly exemplified at St. Peter's. The effect on all who first enter it is that of disappointment; it does not appear anything like so large as they anticipated. Some of its admirers have tried to pass this off as a great beauty, and have attributed it to its beautiful proportion. This reasoning will not, however, stand the test of close examination; it is essentially false. One of the great arts of architecture is to render a building more vast and lofty in appearance than it is in reality. The contrary effect produced by St. Peter's is not the least among its many defects, and it is purely owing to the magnifying instead of the multiplying principle having been followed. The great size of its various parts and mouldings required the introduction of colossal figures, which are certain to reduce the appearance of size in any buildings where they are used.

The human figure is a general standard for scale. We are accustomed to assimilate the idea of about five feet nine inches with the height of a man. Hence, be a drawing ever so small, by inserting a diminutive human figure it will immediately convey an idea of the intended size, and on the contrary, if the figures in a drawing be over large, the apparent space represented is immediately reduced in appearance. So is it in architecture: a figure of 18 feet high will reduce 100 feet to less than 40 in appearance, and the mystery of the disappointing effect of scale in St. Peter's is satisfactorily accounted for. It is all very well for guides and *valets de place* to astonish travellers by stating that three persons may sit on the great toe of a statue, or that if a figure were laid on its back five men might straddle across the nose. So much the worse for the effect of the building where such a figure is placed.

In Pointed architecture we seldom find any images larger than the human size, and generally much less. Hence the surprising effect of height and scale conveyed by many old Catholic buildings, which are not in reality half the size of some of their more modern and semi-pagan rivals at Rome.

In general our English churches are deficient in internal height; not that our national style of Christian art does not possess some fine specimens of this important feature, as in the glorious church of St. Peter, Westminster; but I think the internal vastness of Amiens, Beauvais, Chartres and others of the French churches, should serve as useful examples to us in this respect in the revival of Pointed and Christian architecture in England. Nothing can be conceived more majestic than those successions of arches divided by light and elegant clusters of shafts running up to an amazing height, and then branching over into beautiful intersected ribs, suspending a canopy of stone at the enormous height of not unfrequently 150 feet. Internal altitude is a feature which would add greatly to the effect of many of our fine English churches, and I shall ever advocate its introduction, as it is a characteristic of foreign Pointed architecture of which we can avail ourselves without violating the principles of our own peculiar style of English Christian architecture, from which I would not depart in this country on any account. I once stood on the very edge of a precipice in this respect, from which I was rescued by the advice and arguments of my respected and reverend friend Dr. Rock, to whose learned researches and observations on Christian antiquities I am highly indebted, and to whom I feel it a bounden duty to make this public acknowledgment of the great benefit I have received from his advice. Captivated by the beauties of foreign Pointed architecture, I was on the verge of departing from the severity of our English style and engrafting portions of foreign detail and arrangement. This I feel convinced would have been a failure; for although the great principles of Christian architecture were everywhere the same, each country had some peculiar manner of developing them, and we should continue working in the same parallel lines, all contributing to the grand whole of Catholic art, but by the very variety increasing its beauties and its interest.

In conclusion, Christian verity compels me to acknowledge that there are hardly any defects which I have pointed out to you in the course of this lecture which could not with propriety



* A pillar in Classic architecture is a mere cylinder, of large or small diameter. In the Pointed style a pillar is subdivided into shafts, which increase in number with its size, and form beautiful clusters.

be illustrated by my own productions at some period of my professional career. Truth is only gradually developed in the mind, and is the result of long experience and deep investigation. Having, as I conceive, discovered the true principles of Pointed architecture, I am anxious to explain to others the errors and misconceptions into which I have fallen, that they, profiting by my experience, may henceforward strive to revive the glorious works of Christian art in all the ancient and consistent principles. Let then the beautiful and the true be our watchword for future exertions in the overthrow of modern paltry taste and paganism, and the revival of Catholic art and dignity.



WADDESDON MANOR AND EYTHROPE.*

WHEN I suggested having the annual meeting of our Society at Waddesdon I was asked on more than one occasion what there was there I could point out worthy the attention of an antiquary. I venture to assert that besides the priceless collection of old china and pictures we shall see to-day there is no point of Buckinghamshire, I might say of England, more replete with matters of interest to the antiquarian or student of history than the lovely tract of country which forms the estate round this house. We have only to look from the windows on the magnificent panorama that lies before us to see what I mean. From the earliest times this rich tract of country lying in the centre of England has been a battle-ground. Such names as Denham at Quainton, or the Dane's Ham, Horsendon, or the Mound of Horsa, remind us of the Danish occupation of these parts; Ashendon, close by, which Kennet held to be the site of the great battle between King Alfred and the Danes; Bledlow Ridge, close by, has an ominous sound of blood; and the Gravenshill, near Bicester, might have been the place of the graves of the victims of this great and bloody contest, which probably spread over the flat lands which lie immediately below the hill. In front of us we see the great White Cross telling of some Christian victory over the pagan—possibly cut in memory of the battle of Ashendon. I am aware that there is another district that claims this great battle, but I do not see myself why Kennet may not be right in stating this to have been the place where it was fought. As you look beyond Ashendon on the right on a clear day can be seen the heights of Edgehill, where the first great battle between the Royalists and Cromwell's army took place, where the Squire of Winchendon was present with so many other leading Buckinghamshire squires and their tenants, leaving their hay-carts and cattle in the rich vale and quiet homes to join in the terrible Civil War. In the same direction, as the crow flies, some four miles distant, rises Brill Hill. In early times there was a royal palace there, where the kings, among whom was King John, used occasionally to reside for the sport afforded by the wild boars which the forest of Bernwood, at its base, contained in such abundance. Edward the Confessor was born a few miles further on, at Islip, and made a grant of Boarstall, below Brill, to Nigel for killing a boar of a most savage character, which we may infer was a particular terror to the dreamy monarch. I remember the horn granted on this occasion used to be in the possession of the Aubrey family at Dorton. I hope it is there now.

* From a paper by the Rev. R. H. Pigott, read at a visit of the Bucks Archaeological Society to Waddesdon Manor, the residence of Baron Ferdinand de Rothschild, M.P.

This district played an important part during the Civil War. King Charles held his Parliament and headquarters at Oxford, which you are unable to see from the block caused by the ridges of Ashendon and Brill. Prince Rupert held Brill here with his dashing cavalry, whilst Cromwell entrenched himself at Claydon and Aylesbury. Chalgrove field, which must be almost in sight, was where Hampden fought and died. At Eythrope there was a battle, and in the Verney Memoirs we read how a certain Captain Abercrombie was killed who, a short time before, was one of the officers who surrounded the old house of the loyal Dentons at Hillesden. During the siege he fell in love with one of the ladies of the house he was besieging, and having been married a few weeks was killed close to this house. This little romance speaks eloquently of the horrors of civil wars; the man who had given his heart to the lady, and yet was compelled by the stern exigencies of the time to burn down his future brother-in-law's house.

Immediately in front of us rises the chalk range known as the Chiltern Hills—so dangerous in old times that a steward had to be appointed to protect travellers, which now sinecure office a member has to accept in order to vacate his seat in Parliament. The road which we have passed along this morning is the old Roman road, which passes under the Gravenshill I have alluded to, to where was the Roman city Alcester; where the entrenchments round the old forum are still visible. This road is called the Akeman Street, and is said to have derived its name from the aching men who used to pass along it for relief to the Aquæ Solis of Bath, which before the Roman occupation was celebrated for the curative qualities of its waters. I might add that the late Lord Beaconsfield, who I can remember so well when he first bought Hughenden, used to delight to drive his friends over the Chiltern Hills and tell them how the Great Rebellion, to use his own words, was hatched there. I am sure I have now said enough to make you feel how full of interest the prospect from this house must be to every intelligent Englishman and student of the history of the past.

I am now going to tell you a little about the two places we are about to visit. I claim, of course, to tell you nothing that is original, and should at once tell you that the sources I have derived my information from are chiefly Lipscomb's "County History," Bishop Kennet's "Parochial Antiquities" and Gibbs's "Buckinghamshire Worthies." The mention of this last book reminds us of the loss our Society has sustained by the death of the most accurate and diligent antiquarian, one of our late secretaries. Then there is Macaulay's "History of England" and Lysons's "Bucks," from all of which I have been able to gain information. The associations of Winchendon and Eythrope are full of interest, having contained the houses of some of the most remarkable men that have ever played their parts in the history of this county, and I may even add of this country. It is impossible to do more than give a very slight sketch of some of these singular men who lived here, and I shall keep myself as much as possible to that which has a local interest to us, as Buckinghamshire men.

The property of Winchendon came into the family of Wharton through a marriage with the Goodwins. Thomas, first Lord Wharton, was buried at Kirkby Stephen. The Westmorland monument is a remarkable one, representing the knight resting between his two wives; his head rests on a helmet of a bull's hide. The folds of the helmet were imagined by the poor people to represent Satan, whom he had vanquished, and the long Latin inscription Lipscomb records was profanely parodied in these lines:—

Here I, Thomas Wharton do lie,
With Lucifer under my head;
And Nelly, my wife, hard by,
And Nancy as cold as lead.
Oh! how can I speak without dread,
Who could my sad fortune abide,
With one devil under my head,
And another close laid by my side?

Philip Lord Wharton, like so many of the Buckinghamshire squires, took a very leading part in the Civil Wars. We find him sent up at the request of the Lord General, the Earl of Essex, as the representative of the troops to make a report of the battle of Edgehill to the City of London.

This Lord Wharton, who lived at Winchendon House, was a man of great taste. He had the finest collection of Vandyke's and Sir Peter Lely's pictures in England and laid out vast sums of money to appear in suitable magnificence at the landing of Charles II. In his latter days he became a Calvinist, it would seem, from what Macaulay says of him. There is a lonely little dissenting chapel just behind the site of the old mansion. It is far from any house or village and was no doubt built by Lord Wharton for the exposition of his Calvinistic doctrines. He left money to be used in the purchasing 1,650 bibles, with singing psalms bound up in them. These bibles were to be distributed in various villages, and the recipients in the October following were to be examined as to their general knowledge of the catechism, and if they knew it were to

receive a book called "A Sure Way to Heaven," by Joseph Alleyne, and "The Principles of the Christian Religion," by Thomas Lye, A.M. I wonder if the books are given now in other villages (as I am informed they are given in Waddesdon), and how many children care to qualify themselves to receive the works of the time-forgotten, but no doubt excellent divines, Joseph Alleyne and Thomas Lye, A.M. I might add that it is expressly ordered in the deed that the bibles should be bound in calves' leather and the catechisms in sheep's leather. I have no doubt by this quaint order Lord Wharton thought he was benefiting not only the souls of the children but also assisting the agricultural interest. About this time it was ordered that everyone should be buried in lamb's wool, and entries to this effect will be found in the register. This was also with the same laudable object as Lord Wharton's bindings of calves' and sheep's leather. I might add before Winchendon Church was restored I was, some years back, on visiting it much interested in seeing that the holy table was removed from the wall and surrounded by seats. This, no doubt, was the work of the Calvinistic lord, who introduced the custom at that time in vogue at Geneva by sitting round the table as at an ordinary meal.

But I must now pass on to his son Thomas. He was made a marquis, and was the most popular lord-lieutenant of Ireland that ever existed. He was created Viscount Winchendon, Marquis Wharton, Lord Lieutenant of Oxon, Westmorland and Bucks, and held the office of Lord Privy Seal. I cannot help thinking Macaulay was rather unjust in his most bitter summary of Lord Wharton's character, and in all probability mixed his life and deeds up with that of his son, Philip Dale of Wharton, whose life seems to have been as dissolute as it was romantic. Lord Macaulay refers to the election successes of Lord Wharton.

Such a master of the art of electioneering England had never seen. Buckinghamshire was his own especial province, and he ruled without a rival. But he extended his care over Whig interests in Yorkshire, Cumberland, Westmorland and Wiltshire. Sometimes twenty, sometimes thirty members of Parliament were named by him. He made himself so popular that his journeys to the Buckinghamshire Quarter Sessions resembled royal progresses. The bells of every parish through which he passed were rung, and flowers were strewed along the road. It was commonly believed, in the course of his life he expended on his Parliamentary interests a sum equivalent to 300,000*l.* of our money at the present time. He was quite as dexterous a canvasser among the embroidered coats at the St. James's Coffee House as among the leathern aprons at Wycombe and Aylesbury. Wharton's political adversaries thirsted for his blood, and repeatedly tried to shed it. Had he not been a man of imperturbable temper, dauntless courage and consummate skill in fence, his life would have been a short one. But neither anger nor danger ever deprived him of his presence of mind. He was an incomparable swordsman, and he had a peculiar way of disarming opponents which moved the envy of all duellists of his time. His friend said that "he had never given a challenge, that he had never refused one, that he had never taken a life, and yet that he had never fought without having his antagonist's life at his mercy." In another passage Macaulay describes Wharton and his friends, "the great Whig power of the day, staying at Winchendon for the races," which he says was near there. This old racecourse was at Quainton, I imagine in the flat piece of land near the station, which of course in those days was unenclosed. I remember an old man telling me that in old days it was not unfrequently the case on foggy days for the traveller to be lost on this dreary piece of flat, and that the church bells used to be rung occasionally as a guide to extricate the wanderer from Slack, as it was originally called. This no doubt was the Quainton racecourse, where not only Wharton and his friends used to run their horses, but also where, I think, I have heard that Charles II. had been present on a certain race day. The party, Lord Macaulay remarks, to whose interest Wharton, with such spirit and constancy, devoted his time, his fortune, his talents, his very vices, judged him as was natural far too leniently. He was widely known by the very undeserved name of Honest Tom. Some pious men, Burnet, for example, and Addison, averted their eyes from the scandal which he gave, and spoke of him, not indeed with esteem, yet with good-will. The opinion of the Tories, on the other hand, of him is expressed in a single line, written after his death by Dean Swift, the ablest man of his party, "He was the most universal villain that ever I knew." Lord Wharton died in 1715, and was buried in Upper Winchendon Church, that we shall visit this afternoon.

He was succeeded by his son Philip, who is commonly known as the Duke of Wharton. This Philip was a man of such extraordinary talent that the king soon advanced him to the highest rank of the peerage. In spite, however, of this signal mark of honour we find him shortly after making friends with the Pretender, from whom he accepts the title of the Duke of Northumberland, and is made a Knight of the Garter. He

then becomes a bankrupt and actually joins the army of the Pretender. He afterwards enters the army of the King of Spain, and was present at the Siege of Gibraltar. For this he was indicted for high treason, and his estates confiscated. He is said afterwards to have become a monk, and to have died in the convent of the Charitable Monks of Tarragona. At the death of this most brilliant but profligate man ends the race of the Whartons of Winchendon, and now just a few words about what remains of the house of this most remarkable and interesting family.

The house was said to have had the finest garden in England, but one disadvantage to the house and garden must have been the northern aspect. In "Magna Britannica" it is recorded that the house was celebrated for a fine collection of orange-trees. The garden was formed in the style introduced by the Prince of Orange. The terrace walks may still be traced. Lipscomb records in his time that only a small portion of the north-western angle of the inferior edifices were standing, in which the apartments contained old wainscot. There were pieces of a large gateway and an arch on the west side communicating with the courtyard, also a large and magnificently-designed stable. This magnificent stable, formerly the home of Wharton's gelding, had heavy carved pillars, cornices, mangers and racks, and a stuccoed ceiling partly gilt, indicative of the splendour of its ancient possessors. After the estate came into the possession of Charles Duke of Marlborough, the house was taken down, and John Russel, of Aylesbury, purchased all the material of the building, with the iron gates, palisades and stone images in and about the gardens, for the price of 1,400*l.*, to be paid by instalments. In the Grove or Wilderness, as it was called, on the eastern verge of the gardens, is a small building, which Lipscomb says was built for the residence of a favourite lady; who this lady was we are not informed. It would be most interesting to know what had become of the fine old woodwork and other ornamental materials of this old house, which if the house was as highly finished as the stables described in our county history, must have been of the most elaborate description. In the rectories of Quainton and Grendon, and in the drawing-room of Winchendon Priory close by, there is some fine panelling, all of the same date; possibly this panelling was moved from the house when pulled down. The old family pictures seem to have found their way into houses in the neighbourhood, and Lipscomb seems to have been able to identify some of them; but it is sad that two such interesting houses as the Duke of Wharton's and the Earl of Chesterfield's, both standing in the grounds of our host and his sister, should so entirely have been obliterated, not even a print being left of either of them.

On our way to Eythrope we shall pass a rusticated building which, like that on the brow of the hill behind Dinton, I am informed by Colonel Goodall was built by his ancestors and Lord Chesterfield, not only as an ornamental object in the view, but as a place where the families at Dinton and Eythrope used to meet each other. It is impossible for me to give any account of the Chesterfield family, as my paper has already exceeded the length I had intended. The letters of Lord Chesterfield to his son are English classics. Before the Chesterfields the Dynhams lived at Eythrope. Sir John in the reign of Henry VI. assisted at the relief of Calais; his son was knighted, and became a patron of the House of York. Edward VI. summoned him to Parliament amongst the barons, and made him a Knight of the Garter. The chapel of Eythrope was founded in pursuance of the will of Roger Dynham, 1490. He bequeathed his body to be buried in Waddesdon Church till his chapel should be ready. The chapel was built, and we are told was 42 feet long and 15 feet wide, and wainscotted with oak. Willis tells us in his time there was an old sepulchral monument of grey marble, with brass plates and effigies of a man in armour. This, no doubt, was the monument of the good old knight, Sir Roger Dynham, which was discovered lately.

And now I have a story as remarkable as any ghost story ever told. Browne Willis tells us, with much disgust, how Sir William Stanhope had, by desire of his wife, built up the chapel, and caused Divine service to be celebrated in it regularly for ten years, yet at length in 1738 he most wickedly and sacrilegiously and impiously demolished it. He says he made use of the stones to build a bridge over the Thames. He adds, the tombstone of the founder was taken up and the grave opened in the hope of finding a treasure. On your way back to Aylesbury you will pass over this bridge formed from Sir Roger's old chantry, and will notice the peculiar construction of the arch, which was no doubt caused by having to use stones instead of bricks. But to continue my story, after a time the house of the Chesterfields followed the fate of the chantry. It must have been as interesting and much more ancient than the Winchendon mansion. Sir Roger is pronounced to have resided there in the reign of Edward VI. His son Sir William built a spacious apartment with a covered roof of timber, with angel corbels bearing coats of arms. Later on Dame Dorothy

built a suite of rooms to which the date 1610 was attached at the time of the demolition of the house. In the house was a gallery 133 feet long, and a collection of pictures, which were afterwards sold by auction. In time this fine old mansion shared the fate of so many interesting houses in this district. It was entirely demolished, and not one single stone was left to tell where stood the chantry of Sir Roger Dynham or the stately home of the Earls of Chesterfield. Some years ago Miss Rothschild laid out the beautiful gardens we shall visit on our way back to Aylesbury. On the site of the old mansion and chantry a night watcher had to keep guard over these lonely gardens at night, and particularly objected to go to one spot during his nocturnal vigils, asserting this particular spot was haunted. Notice, I understand, had also been taken that in this particular place there was a spot where grass refused to grow, and that when all round was verdant this place remained brown and dried. It was determined to remove the earth here, and on doing so within 6 inches of the surface they discovered, in a broken-in lead coffin, the remains of the good old knight, Sir Roger Dynham. In the coffin were the bones and teeth of the founder of the desecrated chapel and a rusty spur. There could be no doubt whose remains they were, for with the coffin was a monumental stone, with brass plates and the effigy of a man in armour, supported by pillars, with four shields of arms. These were the same arms and inscriptions as recorded by the old antiquary Willis. On the three arches of the canopy still remain the words, "Mercy, Christ, Grace." Around the verge is a long Latin inscription. After a rest in the green fields of Eythrope of over 500 years, the bones of the old knight, Sir Roger Dynham, again rest in consecrated ground. The remains were removed at the direction of Miss Rothschild to Waddesdon churchyard, under the shadow of the porch.

I have told you this story as told me by the rector of Waddesdon, and I can conceive no story more remarkable. That 400 years ago a man should be buried in Waddesdon Church and then be removed to his chantry, that the religion of his country should change and no chantry priest be allowed to pray for his soul supported by the money he left was no doubt enough to make the spirit of the brave old knight uneasy. But that a successor at Eythrope should have actually desecrated this beautiful old chantry and made a bridge over the Thames with the stones he had hoped to cover his remains must have been horrible; but that this successor should have actually broken open his coffin in search of treasures, and have taken one of his spurs (for one was taken), was certainly enough to cause his disturbed spirit to wander over the spot. I can in conclusion say I thoroughly sympathise with the ghost of Sir Roger Dynham. I think it indeed sad that the indifference of the last century should have allowed the desecration of such interesting old churches as Eythrope, Quarrendon and Hogshaw in our immediate neighbourhood, and that the lack of taste and veneration for antiquity, such as our Society endeavours to foster, should have allowed such grand old houses as Winchendon and Eythrope, with their magnificent gardens, carved panelling and windows full of fine painted glass carrying the shields of arms of the old possessors, to have been utterly destroyed. In the name of the Bucks Archaeological Society I tender to the ghost of Sir Roger our sincere sympathy, and sincerely trust that the visit of the Society to his resting-place of 400 years may be taken as a token of our respect, and that in future no night-watcher at Eythrope may be frightened by this troubled and indignant spirit.

Baron Rothschild said there was a small building at Winchendon in which the agent of his estate resided. That building formed part of the offices of the ancient manor that had been alluded to, and was at the present time panelled with the ancient panelling used in the olden times. It was also occupied in the same manner now as it was some centuries ago, namely, by the bailiff of the estate or one of the upper servants.

THE CARLISLE INFIRMARY.

A MEETING of the health committee of the Carlisle Urban Sanitary Authority has been held to consider the subject of the new infirmary buildings.

Mr. Howitt, secretary of the infirmary committee, appeared before the committee to show cause why the new nurses' wing just added to the Cumberland Infirmary should not be pulled down in consequence of a breach of the by-laws. The alleged breach of the by-laws was that the buildings had been put up without having had the plans passed by the Urban Authority. Mr. Howitt, says the *Carlisle Journal*, read a memorandum which had been drawn up by the infirmary committee on the subject. It entered into a number of details. In the first place they repudiated the notion that they had any wish to act in contravention of the by-laws, and said they had trusted to their architect and builder to carry out the formalities and to give all necessary notices. They were made aware on January 18, 1893, that the city surveyor had declined to approve

the plans first submitted because (1) in certain cases it was proposed to use 4-inch drains, and (2) the partitions between the bedrooms were cross walls, and as such were not 9 inches in thickness. Their architect, Mr. Ferguson, appeared before them on January 25, 1893, and stated that the 4-inch diameter of branch drain had been passed, but that the plans had been rejected on the question of the cross walls, which, however, would be rectified. A minute to that effect was entered in the books of the infirmary committee. That committee were informed by Mr. Ferguson that all notices required by the by-laws had been duly served, and if the by-laws had been infringed in any instance, however small, the committee expressed their regret and ventured to hope that the health committee would see their way to approve the plans which had been used, if not already approved.

The Town Clerk said that when Mr. Ferguson first sent in plans four objections were raised and discussed, and letters were written, some of which were sent by Mr. Ferguson to the newspapers. The plans were not approved, but the committee agreed that upon certain alterations being made and plans again submitted an arrangement might be come to. No fresh plans meeting the objections were sent in, and therefore no plans had ever been approved. They had Mr. Ferguson's own testimony in the words quoted at last meeting about the "strong infirmary committee," in which Mr. Ferguson said that no notice was taken of certain objections which he described as illegal, there being a strong infirmary committee, and that later on, on the advice of the Town Clerk, the objections were withdrawn.

It appeared from the discussion which followed that the plans originally sent in had been disapproved, and that in a subsequent discussion the committee indicated the lines on which fresh plans ought to be drawn to meet their objections. Fresh plans were never submitted, and the by-laws had therefore been broken. The committee now stated that they would be willing to consider fresh plans if sent in, showing how the new Nurses' Home had been built, and the matter was left there.

KIRKSTALL ABBEY.

THE work of preserving the historic abbey ruins at Kirkstall is, according to the *Leeds Mercury*, progressing but slowly. It is a difficult task, and one not altogether free from danger. Three years have elapsed since the masons first commenced their labours, and for another twelve months at least they will be busily engaged. The expenditure by the Corporation upon the abbey and grounds amounts already to about 5,500*l*. The repairing of the vaulting of the chancel and the strengthening of the tower is now engaging the attention of Mr. Micklethwaite, the architect. In 1779 the north-west pier and the north and west arches were utterly destroyed by the fall of two sides of the tower. What is left of the tower had, up to recently, nothing to support it on the north side, and an unusually violent gale might at any time have brought it down. Even now the masonry of the upper part of the tower is in a very crumbling and unstable condition. The chancel is at present filled with a network of scaffolding poles. The greatest possible care has to be exercised in fixing this scaffolding, the slightest touch in certain parts of the ruins being sufficient to detach large pieces of masonry. The western portion of the church has been secured for posterity. In an especially good state of preservation is the west entrance, where very little new work has been required. With the north transept, on the other hand, it has been found necessary to rebuild a considerable portion. After the preservation of the abbey itself has been completed the architect will deal with the cloisters, which are now in a very unsatisfactory condition. Traces of the destructive effect of ivy roots are everywhere evident. For a time the clinging ivy no doubt strengthened the ruins. When, however, the roots of the creeping foliage had once worked their way between the stones the latter were displaced as the roots expanded. The grounds around the abbey are not as picturesque as they might be, though certainly there has been a slight improvement during the past twelve months. Walks have been laid out, an embankment built along the river-side and planted with willows, and a portion of the ground banked off, to eventually be flooded and made into a lake. There has been no attempt, however, as yet at laying any part of the ground out in pretty garden plots, or anything of that kind. About a week ago Councillor Womersley, the chairman of the Kirkstall Abbey committee, made a present to the Corporation of a neat-looking band-stand. This has been placed about twenty yards from the ruins, and about are provided a number of seats for visitors to occupy on band nights.

Within the past few weeks there has been afloat an extraordinary rumour concerning supposed hidden treasure beneath the ruins. With Mr. Irvine, the clerk of the works, and local antiquaries the idea does not find favour. If there had been anything of the kind one would have thought that in digging the holes for scaffold-poles, or about a year ago when drains

were constructed, that something of this mysterious hidden treasure would have been found. However, extracts from the letters which the mayor, Mr. T. R. Leuty, has received from a gentleman giving the address of Biggieswade, Bedfordshire, may prove of interest. In the letter dated August 12 the writer says:—

"A declaration strange in itself and entirely without precedent has been addressed to Mr. Lumb, of the Thoresby Society. This declaration is based on the belief of treasure trove being concealed at Kirkstall Abbey. Naturally Mr. Lumb and his confrères believe the idea originates in hallucination. The zeal and honesty of the individual who has made the announcement is beyond question, because the expense of failure would fall on him and no moral obloquy would rest on Mr. Lamb and his coadjutors. On the other hand, should the quest prove successful their position would be that of embarrassment and perplexity, because the probability is that they have not the available funds to comply with the stipulated conditions. There seems to be the need of the sanction of the Leeds Corporation through its mayor and chief magistrate. . . . The search for the supposititious treasure will need no exploiting. Its exact position will be defined so that no error can arise, and as it is supposed to be only 6 feet below the surface of the ground, a man could unearth it in about two hours or less. According to the occult message it comprises the articles of silver plate used in the abbey before the dissolution. They are stowed in the huge old plate-box in which they were kept when out of service. This chest and its contents were buried by Henry Pearson, the abbey steward, to prevent the treasure falling into the hands of King Henry's abbey raiders—a precaution which seems not improbable in those wretched times. *Verbum sat sapienti.*

"P.S.—The secret, if so it may be termed, is limited to yourself and Mr. Lumb, and to you twain would belong the honour of the proceeding, if success should crown the quest. I have made the suggestion known to no one else. Please kindly think over the matter, and apprise me with what you think is equitable and right."

Receiving no reply to this communication, the gentleman wrote again on August 16 as follows:—

"The application must have appeared very strange to you. It must have furnished you with sufficient evidence to doubt the sanity of the writer, because it involves a proposal probably without precedent. My present purpose, however, is not to discuss an occult theory, but simply to ask if permission can be obtained of the authority you represent for opening the ground at Kirkstall Abbey for the one and sole purpose of endeavouring to find the location of treasure that is supposed to be hid there. The expense of the excavation I will bear. If this permission be granted, and any buried treasure be found, would you be disposed to grant me one-half of the ascertained value of whatever was thus found?"

"P.S.—I have been waiting for a reply to the proposal I have made to Mr. Lumb, who, I presume, has communicated it also to Mr. Irvine, the clerk of the works. I think they must of necessity be sceptical relative to so strange an allegation. I know that I should be so were I occupying either of their positions. Nevertheless I think it must, in common fairness, be conceded that no amount of scepticism entirely justifies complete silence. Cannot you suggest some reasonable *modus operandi* for bringing the matter to a practical issue—i.e. for confirming the supposition or exploding the pretension? If the allegation is purely mythical, no expense will be incurred and no injury done. If, on the other hand, some concealed treasure exists there and the same can be discovered, would it not be desirable to secure it and adequately recompense the finder? To do neither one thing nor the other, to remain inoperative and silent, does not appear to be the best policy to pursue. If the Society, through its exponent, declines to do anything, will it allow me to make the search, all derelict to belong to the finder?"

Other letters have also been received. It is not likely, however, that the committee will take any action in the matter.

BUILDING REGULATIONS IN SCOTLAND.

At the meeting of the Scottish Sanitary Association on Friday last, Baile Primrose, Glasgow, read a paper on the effect of building regulations on the growth of a city. By the common law of Scotland, he said, the control of buildings in royal burghs was entrusted to an official called the Dean of Guild, who had the status of a magistrate, and in most burghs was a magistrate. The practice regarding the office and functions of the Dean of Guild was not unknown in the royal burghs of Scotland; but, speaking generally, he had jurisdiction to see that buildings within the burgh were not dangerous to the lieges, and that they did not encroach either on the public streets or on the property of neighbours. He had no right to interfere with internal arrangements. The common law jurisdiction of the

Dean of Guild was confined to questions of encroachment and to precautions for the public safety. But it was found that, particularly in large towns, more control was required over new and existing buildings so as to remove or mitigate the evils arising from overcrowding and from unwholesome dwellings. Accordingly a new departure was made by the city of Glasgow in 1862 by the Glasgow Police Act of that year. While taking nothing away from the Dean of Guild, his jurisdiction was considerably extended, and he was entrusted with various matters over which at common law he had no control. As regards streets, the Dean of Guild was by this Act clothed with jurisdiction similar to his jurisdiction over buildings, the object being to prevent in future the formation of narrow tortuous streets enclosed between high houses—such streets as were common in the older parts of all old towns. A minimum width of 40 feet was indicated for public streets, the level of the street was placed under his control, and, most important of all, he was empowered to fix the height of the buildings relatively to the width of all such new streets. While not prescribing any fixed limit to the width of new streets, the result aimed at in the interest of the public health was reached by securing low buildings fronting the narrower streets and higher buildings fronting the broader. As regards buildings, other matters besides mere questions of encroachment were by this Act entrusted to the Dean of Guild. He was enjoined to satisfy himself not only that the walls and timbering were of sufficient stability, but also that the water-supply was adequate, that the drainage was efficient, that the ashpit and water-closet accommodation was ample and that the ventilation was properly secured; he was required to enforce a minimum size for every sleeping apartment, a minimum width for every common stair and entry and a minimum free space in front of the window of every inhabited room; and as regards public buildings, such as halls and theatres, he was entrusted with power to regulate exits and passages. In the exercise of these new and extended powers the Dean of Guild was guided to a large extent by the advice and assistance of the master of works for the city and the experts who acted as assessors (technically called his brethren in Council) in the Dean of Guild Court. But after thirty years' experience it was felt that the time had come for a more thorough control over new buildings, and this led to the passing of the Glasgow Building Regulations Act, 1892. The committee entrusted with the drafting of the Bill and its promotion in Parliament were at the very outset forced to consider the question of the constitution of the Dean of Guild Court, and whether it would not be desirable in the public interest to so alter the constitution as to make it a more representative body, in the sense that the members of the Court should sit there by virtue of popular election, and not as the elect of close corporations. The question was discussed in every aspect, and after mature deliberation it was considered desirable that in the meantime it was not necessary in the public interest to propose any change in the constitution of the Court. It was argued that, standing as the Court did in a judicial position between the local authority on the one hand and the public on the other, it was desirable that so long as the Merchants' House and the Trades' House exercised a wise discretion in the selection of the members constituting the Court, they should be given opportunity to justify their continued privilege by wisely administering the fuller powers about to be placed in their hands. It is only right to say that during the two years the Act has been in operation the Dean of Guild and his Court have exercised the very large powers conferred by the Act with credit to themselves and benefit to the city. Let those responsible for the *personnel* of the Court continue to send as their representatives men of civic instinct and practical knowledge, and they will justify the confidence that gave them continued existence with enlarged powers. The general scope of the Act was twofold—to amend and extend the power of control contained in the existing Police Act, and to confer upon the police commissioners power to make by-laws containing detailed regulations upon the subjects mentioned in the Act, so giving some idea of the extent of the Act and the variety of subjects embraced in it. The most important provision of the Act was that which gave the police commissioners power to make by-laws. The scope of the by-laws was very extensive; it embraced all the subjects already mentioned as having been dealt with to a partial extent in the legislation of the last thirty years. When confirmed by the Secretary for Scotland these by-laws were binding as if contained in the Act, and they might be altered from time to time as occasion required. The result was that the Police Commissioners had power to deal with matters omitted from the Act, and to extend the scope and increase the efficiency of the provisions which the Act contained, as well as to prevent evasions of the statutory provisions themselves. The Police Commissioners had made a set of by-laws, seventy-four in number, but they had been in force for too short a time to permit any definite opinion to be expressed as to their value. They were the first attempt in Scotland to formulate detailed building regulations, and as

such were necessarily experimental. The conditions under which building operations were conducted in the towns of Scotland were so different from the practice in England that the experience gathered by the Local Government Board was of comparatively little use. The aim had been to confine the regulations to those matters in which the community have an interest, omitting everything that concerned merely the private proprietor. This limit confined the regulations to such matters as concern the health or comfort of occupants of urban property, and excluded everything connected with design or controlled by taste or fancy. And this aim had been further limited by confining the regulations, even in those matters which concerned the public health, to measures sanctioned by experience, and upon which there was practical agreement among experts. The Police Commissioners had recognised that any series of regulations which had the effect of either preventing experimental works reasonably conducted or enforcing uniformity would do serious harm to the community for whose benefit they were enacted by preventing, or at least retarding, progress and improvement on a branch of science which is as yet far from perfect. When the Bill was before the House of Commons committee the committee desired to be satisfied that some expert in connection with the Scotch Office should appear before them in order to state that he had gone over the Bill, and was satisfied from his knowledge and experience that there was nothing in it contrary to law or the best Scotch experience in building, architecture and sanitary work. Mr. Muir, of the Scotch Office, appeared before the committee and informed the chairman that the Scotch Office had no official whose experience could guide them in respect of such a Bill, but the committee obtained the services of the architect for the London County Council, who went over the Bill, and was able to assure the committee that all its clauses were in order and equitable. Now that the Local Government Bill was being passed through Parliament, it should be urged on the Government to provide in connection with the Scotch Office, or with the new Local Government Board, an expert of experience who would be able to assist municipalities, burghs and county councils as to the drafting of adequate and proper building regulations. This would also have been a suitable time to have given county and district councils the power not only to draft such by-laws, but also to constitute within the counties courts equivalent to the burghal Dean of Guild Courts, in order that speculative and other builders might not be permitted to erect dwelling-houses and other structures free from all official inspection and control. So far as he was aware this chance had been missed, as nothing up till now appears on the face of the proposed Bill which would confer such a useful power on county or district councils. In conclusion, he reviewed specially the sanitary clauses of the Glasgow Act—provisions which he said could not fail to have a salutary effect in helping to solve the great and growing problem of rendering city life more wholesome and healthful. As the trend of events was towards vaster and vaster aggregations of humanity in our cities, it must be apparent that every well-considered measure such as he had attempted to describe must have a potent effect alike on the growth and well-being of their cities.

Mr. Wm. Mackison said that in Dundee, although they had had powers to form by-laws, these had been in proof over fifteen years, but had never yet been approved by the sheriff; and, as engineer of Dundee, the speaker had just to be a living by-law himself. But he had never failed to protest against anything that he saw to be inconsistent with the health of the community, whether the Act covered the powers or not.

Mr. James Chalmers, president of the Sanitary and Social Economic Section of the Glasgow Philosophical Society, said that as a member of the Institute of Architects of Glasgow he was deputed to go through the minutes of the Town Council for twenty years back, and he found that the inception of a separate Building Act for Glasgow was about twenty years ago in the Institute of Architects, on the motion of Mr. Honeyman. The Institute of Architects of Glasgow went to the expense of printing a special Building Act, and with that Building Act they repeatedly knocked at the doors of the then Town Council of Glasgow with no success. The Town Council persisted in having a Police Act, including in that Act building regulations. He complimented Bailie Primrose that he had been instrumental in carrying out the aspirations of the Institute of Architects. He thought the Town Council should go further, and, as they had supplied pure water, should supply fresh air for each inhabitant.

Mr. Gordon, Hawick, said that he thought one of the defects of Glasgow was that they tolerated ashpits, because, in his opinion, such things could not exist in back courts without becoming a nuisance.

Bailie Primrose, in reply to Mr. Chalmers, said that the Institute of Architects knocked at the door of a Council who, in attempting to prepare an order, had been so severely sat on by the landlord interest that they were not in a frame of mind to receive such a suggestion.

THE PROPOSED WESTMINSTER CATHEDRAL.

THE proposals for a Roman Catholic cathedral for London, which have been under discussion for nearly thirty years, have at last, says the *Times*, taken definite form, and the style of architecture to be adopted has now been decided upon. In 1865, after the death of Cardinal Wiseman, it was decided by a public meeting of Roman Catholics to perpetuate his memory by the erection of a cathedral for the Metropolitan Roman Catholic see; and, subscriptions for this purpose having been invited, Cardinal Manning was ultimately enabled to purchase for 55,000*l.* a site for the cathedral. This consisted of 4½ acres of land on which the Westminster Bridewell used to stand, and which has since been valued at 300,000*l.* Since the death of his predecessor, Cardinal Vaughan has suggested that the names of Cardinals Wiseman and Manning, who both took such prominent parts in establishing the Roman Catholic hierarchy in England, should be linked together and the memory of their services perpetuated by erecting a cathedral which might be regarded as the completion or crown of their work. Although the opinion has been expressed that Cardinal Manning would have preferred to be remembered for his work among the poor to having any monument set up to him, his successor's suggestion evidently meets with general approval among Roman Catholics. Many thousands of pounds are still required to carry out the scheme, but enough money has already been contributed or promised to enable a start to be made. Mr. J. F. Bentley, an experienced ecclesiastical architect, who has designed several Roman Catholic churches, amongst others that of the Holy Rood at Watford, of Corpus Christi at Brixton, and of St. Mary's at Kensal Green, and who has also recently restored the City churches of St. Botolph, Bishopsgate, and St. Botolph, Aldgate, has accordingly been entrusted with the preparation of the plans of the new cathedral. A style of architecture perfectly unique so far as London churches are concerned has been chosen—the ancient Basilican or primitive form of Christian architecture. The original cathedral of Canterbury appears to have been of this character, but there are now only a few Basilican churches in England. Mr. Bentley's plans are to be ready next June, and on the 29th of that month, the feast of St. Peter and St. Paul, it is expected that the foundation-stone will be laid. The model for the new cathedral is to be Constantine's church of St. Peter in Rome, the defects of which will not, however, be reproduced. It will be at least 350 feet long by 170 feet wide and 100 feet high—all internal measurements. It is to accommodate 10,000 and seat 8,000. In addition to the cathedral there is to be a lecture-hall capable of seating 2,000 people. There is also to be a monastery for thirty monks and forty-five lay brethren. The Benedictines, who for centuries served Westminster Abbey, are to be invited, if funds permit, to return. The buildings will, it is expected, cost fully 250,000*l.* before they are completed, and may possibly include a new house for the Archbishop, in which case the sale of the site of his present house would, it is thought, realise a considerable sum towards the expenses. A new house for the Archbishop is not, however, part of the present scheme. Of the 250,000*l.* required not quite half has yet been found, although a single subscriber, who was also the principal contributor to the purchase of the site, is understood to have given or promised nearly 20,000*l.*, and it is not expected that the whole of the necessary money to complete the work will be forthcoming for some time. The fact that the Brompton Oratory cost, without altar or decorations, 89,000*l.*, and St. James's Roman Catholic Church in Spanish Place, 45,000*l.*, shows that English Roman Catholics have had heavy building expenses to defray with the last few years. A suggestion has been made by an influential member of the Church to the effect that the whole of Roman Catholic Christendom should be appealed to through the bishops for support. Meanwhile it has been decided that the name of each person giving not less than 1,000*l.* shall be inscribed on the cathedral as one of its founders, and liberal donations are expected from America and the colonies.

ARCHITECT'S FEES.

IN the Carlisle County Court Mr. Joseph Graham, architect, Devonshire Street, sued the Holme Cultram Local Board for 53*l.* 7*s.* 6*d.* for balance of salary and work done. The case had been remitted from the High Court. In the particulars of plaintiff's claim 30*l.* was entered as salary due on October 20, 1893; 48*l.* 7*s.* 6*d.* fees for work done and money expended as per account rendered—total, 78*l.* 7*s.* 6*d.*, reduced to 53*l.* 7*s.* 6*d.* by cash, 25*l.*, received on account on December 7, 1892. In further particulars of the claim details were given of the numerous visits to Silloth, preparing plans and inspecting for the Local Board *in re* borrowing powers, obtaining names of frontages, preparing apportionments, supervising drainage work and flagging, &c.

The plaintiff stated that in June 1890 he applied for the post of surveyor to the Holme Cultram Local Board in reply to

an advertisement which stated that the work was to have reference to streets "in course of construction." He offered to do the work and pay ten visits for 30%. Plans were supplied to him which were inadequate because no names of owners nor measurements of frontages appeared thereon. Consequently he had to survey the whole of Silloth and obtain the names. That work took him and an assistant over a week, for which he charged 5%. When he tendered for 30% he had expected to find proper working plans already in existence. The work should have been completed in six months, but it took three years. The contractor was delayed by want of capital. Witness paid twenty-five visits to Silloth during the course of the work. Eight or nine times he met the committee at Silloth specially at their request. In August 1890 he met the committee to confer with them about an account, and on February 23, 1891, he had to go and see one of the committee, in order to explain the apportionments. Similar special visits were paid at certain dates ranging from 1891-93. Witness then gave details of the extra work he had had to do in consequence of mistakes in the original plans, &c., the charges under this heading amounting to 48*l.* 7*s.* 6*d.*

Cross-examined: The particulars of the claim were copied out of his diary. An agreement with the previous engineer was never heard of by him until he began to press the Board for the money. He had often verbally complained to the committee of the slowness of the contractor, who had only two men at work, and there was a clerk of the works at 2*l.* a week to look after those two men. He knew he had the power to employ other contractors, but the committee would not allow him to do so. Two members of the committee did not want him to turn away the contractor because he was a decent sort of fellow, and they were willing to give him time. One of the days (November 6, 1890) he met the committee was a Sunday, but that must be a mistake in his diary. He got 16*l.* for taking out quantities for the second contractors.

At the conclusion of the cross-examination the Judge said if the plaintiff had to do all the work he had spoken to, the Board could hardly expect it to be done for 30%.

Re-examined, plaintiff stated that the Board deducted 142*l.* penalty money from the account of Mr. Crosthwaite, the contractor, and he was present when they decided to do that, supplying the information upon which the decision was come to.

An assistant to the plaintiff deposed that he had to go from door to door in Silloth to make the survey requisite to fill up the plan, which, when plaintiff received it, was a mere skeleton.

For the defence, Mr. John Johnstone, builder, Silloth, a member of the defendant Board, was called. He deposed that plaintiff first canvassed him for his support on the bowling-green at Silloth. He told plaintiff he would have to carry out Mr. Bell's plans, make all the apportionments, and make ten visits to Silloth.

Cross-examined: He could not say what happened to the first surveyor. Was he starved off the job?—Witness: He'd be glad to get it, I should think.

By the Judge: He would not care to offer an architect only 30% for three years' work in connection with his buildings.

The Judge said that plaintiff had had to do work which he did not anticipate and he ought to be paid for it. He should refer the matters of detail to the Registrar, unless the parties consented to his giving judgment for a definite sum.

The lawyers having consented to the latter course, the Judge gave judgment for the plaintiff for 34*l.*, including the 5*l.* paid into court.

STREET IMPROVEMENTS.

IN the course of the next fortnight one of the most desirable street improvements that has been carried out in Edinburgh for many years past, the *Scotsman* says, will be completed. Since the first was heard of widening Salisbury Place the Edinburgh Town Council has several times changed its complexion, but though the efforts for the acquisition of the necessary property have seemed at intervals to languish, the important improvement involved has never been altogether lost sight of. About eight years ago a commencement was made with the scheme when certain proprietors came before the Dean of Guild Court with an application for warrant to erect new shops on the south side of the street. The city then seized the opportunity of purchasing a strip of ground to increase the width of the street at that point, but as the rest of the thoroughfare remained as before it was not of itself a great advantage. Efforts were then made to induce Mr. Adamson to set back his office which stood at the corner of Minto Street, but the city failed to get him to consent to what they considered reasonable terms. Then the situation became more complicated by the shop at the opposite corner being brought forward, and it became imperative for the sake of public safety and convenience that the street should be widened. When the new Improvement Bill was promoted, it was decided that this matter should be included, being second only in the estimation of the

Council to the Bristo Street improvement. This was done, the necessary powers were obtained, and in a few days Salisbury Place, which used to be a confined street of 29 feet in breadth, will be a comfortable thoroughfare of between 41 and 42 feet in width. In order to obtain this uniform width negotiations had to be entered into with the tenants of the shops already referred to, in order to set back the front an additional 6 or 8 feet beyond what had been done in the first instance.

CHURCH BUILDING AND RESTORATION.

Brecon.—The reparation of the grand old tower at St. Mary's, Brecon, which stands in the centre of the town, is now being carried out under the direction of Mr. F. R. Kempson, F.R.I.B.A. The utmost care is being taken to preserve old work. Nothing is being replaced except what has been demolished by time, or which is found to be either totally decayed or dangerous. All the framing for the bells will be new as well as the floors. Stone has been selected which harmonises with the old work. Cement is being used throughout instead of lime, and the utmost care has been taken to make the fabric thoroughly substantial. The commencement of the work was delayed for unavoidable reasons, but every effort is being made to complete the more important parts before the coming winter.

Nottingham.—The cathedral of St. Barnabas, Nottingham (R.C.), was reopened on Sunday, the 26th inst., after interior restoration and decoration, the style corresponding with that of the cathedral, viz. pure Early English throughout, from designs by Mr. Thomas F. Norman, ecclesiastical decorator and artist in stained-glass, St. Nicholas Church Street, Warwick.

GENERAL.

The Marquis of Bute is continuing the excavations in the grounds of the priory of St. Andrews, which he lately purchased. Among the recent discoveries have been two heads belonging to statues of Christ and King Malcolm.

Two Oil-Paintings and three drawings have been purchased for the Sydney National Gallery. They are *Virginia di Monte San Giorgio, Perugia*, by Professor Giovanni Costa; *Shorthanded*, by Lionel Smythe; *The Bedouin's Home*, by F. Goodall, R.A.; *Fleet Street*, by Herbert Marshall; and *Gringoire*, by E. R. Hughes. As the amount of the Government grant has not yet been expended, several more paintings will probably be purchased.

The Congress relating to Christian archæology has been concluded at Zari, Dalmatia. It has been decided to publish all the early Christian inscriptions found in Austria-Hungary and Bosnia, with a complete description of the surviving monuments. The next congress will be held in Ravenna in 1897.

M. Léon Cugnot, the French sculptor, has died in Paris. He obtained the Prix de Rome in 1859. Among his works are the figures of *Power* and *Justice* at the Cour de Cassation, *Patriotism* at the Louvre, and the statues in the Salle des Cariatides in the Hôtel de Ville.

The Excavations for the foundations of the new Opéra Comique in Paris are in progress. The concrete will be laid in about a month, and the masonry will then be commenced without delay.

The Jury of the Annual Art Exhibition, which is being held in the Crystal Palace in Munich, have awarded the first medal to the English painter, Mr. Henry Scott Tuke. Medals of the second class have been awarded to the painter, Mr. W. Fusse, and to the architect, Mr. Alexander Koch, of London.

The Aberdeen Artists' Society's exhibition will open in the Art Gallery on October 1.

The Sheffield Society of Artists will open their twentieth annual exhibition of pictures on Monday, September 10. Mr. Herkomer will give a lecture on the occasion.

The Twenty-eighth Annual Convention of the American Institute of Architects will be held in New York on the 15th, 16th and 17th of next October.

The Temperate House in Kew Gardens is about to be extended by adding two wings at the north and south ends, which will increase the size of the building by half its present dimensions. The cost will amount to about 12,000*l.*

Mr. Batsford will publish early in September a new edition of Meyer's "Handbook of Ornament," the first issue of which was exhausted in three months. The new edition has been carefully revised by Mr. Hugh Stannus, F.R.I.B.A., lecturer on applied art at South Kensington, and contains about 3,000 illustrations of the elements, and the application of decoration to objects.

The Architect.

THE WEEK.

THE works committee of the Brighton Corporation have recommended that the whole of the works proposed by Mr. MAY be carried out, and that arrangements for the purpose be entered into. The expenditure is estimated at 47,000*l.* The works comprise the construction of two concrete groynes and a sea-wall for the protection of the front at the east end. One of the groynes will be 500 feet long and 10 feet 6 inches wide, and will be arranged for a promenade. This work will cost 14,000*l.* A sea-wall will also be constructed for the west end at a cost of 19,000*l.* It will be of such a height that neither boating nor bathing will become more inconvenient than at present, and eventually there will be an accumulation of beach in front of the wall which will allow of easy approach to the foreshore. The Madeira Road Terrace is also to be extended for a distance of 1,530 feet, or nearly the third of a mile, at a cost of 14,000*l.* The Town Council appear to be resolved that the supremacy of Brighton must be kept up no matter how great the outlay. It has been already demonstrated that the works for the improvement of the sea-front have brought profit to the town, and those about to be undertaken are likely to be as advantageous.

THE Glasgow Corporation on October 20 appointed a sub-committee to consider the subject of the decoration of the Municipal Buildings with the aid of Mr. WILLIAM LEIPER, architect. Among the buildings visited were St. Paul's Cathedral, London, the Amiens Museum, the Hotel de Ville, the Panthéon and the Palais de Justice, Paris. One of the members also examined the Sistine Chapel and the Stanze in Rome, besides buildings in Florence and Venice. The report states that the principal conclusion to which the deputation came is, that to execute great decorative works the co-operation of great artists is indispensable. It is only thereby that works which will live and will grow in reputation can be secured. The power, the prosperity, the civic pomp of Venice have passed away; but the monuments of the greatness of the city, ordered and executed in the days of its wealth and influence, remain to this moment and to all time fitting memorials of the greatness of the people and of the liberal intelligence which accompanied their commercial and maritime predominance. The artists employed should, in the opinion of the deputation, be controlled by one authority, only to the extent of the harmonious colour scheme and uniformity in the subordinate coloured decoration and gilding and architectural features. The deputation are of opinion that such coloured decoration should be sparingly employed, and that in the figure panels a flat treatment with little shadow should be demanded, so that the wall surfaces may be kept unbroken. The deputation conclude by saying that they were deeply impressed with the magnificence of the mural decoration in the public buildings they saw. It is obvious that the authorities who have such work to perform look upon it both as a great duty and a great opportunity, and there is no doubt that much of the work which is now being placed on the walls of these structures will go down to the future as the richest and most characteristic artistic products of the century. As a practical outcome of their investigations, they have to report that Mr. LEIPER has completed a coloured study, showing a design for the colour decoration of a compartment of the banqueting-hall. He proposes that the large spaces should be made simpler, some of the mouldings which at present sub-divide the panels being removed, thereby forming one large panel instead of a series of smaller ones, the opportunity for a larger and more dignified treatment of wall-painting being given thereby. The spandrels and other circular compartments would be filled with figures illustrative of the arts and sciences for which Glasgow is celebrated. The general scheme of colour would be light without being weak, and would be arranged so as to be a harmonious setting for the wall-paintings. The sub-committee have resolved to recommend the adoption of Mr. LEIPER's project, subject to such modifications on the execution of the work as may be found to be desirable.

It is satisfactory to find that the deputation are able to appreciate the work of M. PUVIS DE CHAVANNES, which was first made known in this country by means of articles and illustrations in *The Architect*. About his work in Amiens it is said:—"Without illustration it is impossible to convey any conception of the soft harmonies, the nobility and serenity of the suggestive allegorical groups with which the artist has enriched his native city. The deputation is safe in saying that nothing more masterly and effective in the way of mural decoration has been accomplished in modern times than has been done by PUVIS DE CHAVANNES in Amiens." In describing the works in the Panthéon, Paris, the report says:—"The colour these wall paintings lend to its walls greatly enlivens the aspect of the interior, and the appropriate subjects illustrated with unsurpassed vigour give a personal and historical interest to the building which renders it peculiarly attractive and pleasing to the visitor. The mosaic pictures in the chancel of the Panthéon, and others subsequently seen in the Louvre, where several cupolas are being treated by this method of decoration, did not appear to the deputation to be so successful as those of Mr. RICHMOND in St. Paul's Cathedral. In the Palais de Justice the deputation also saw two beautiful frescoes, or rather wall paintings, by MERSON, which appeared to be very suitable for their position, the colour being most delicate and refined." There is no doubt that the modern mosaics in Paris are inferior to those in St. Paul's, but if they were seen under the subdued light of London some of their glaring defects might be less obtrusive.

It has taken a long time to persuade the Neapolitans about the advantage of an abundant water-supply, but as they now consume about 44 gallons per head every day we suppose they are convinced. The British Consul reports that the supply is derived from the springs of Urincoli, which are about thirty miles distant from Naples. The water is conveyed by a covered masonry canal lined throughout with Grenoble cement, laid generally at a depth of 3 feet below the surface of the ground. Under the hills there are tunnels; over valleys there are aqueducts raised 66 feet, in one place changing into four parallel iron tubes, 2½ feet wide, which descend into the valley of Cronti, and rise on the opposite side. Two covered reservoirs have been constructed on the hill of Cancellio, about 12½ miles distant from Naples. The reservoirs are at the respective elevations of 68 and 444 feet. From the reservoirs three iron syphons proceed down into the plain and up into the hill of Capodimonte, which dominates Naples. These reservoirs may be reckoned among the grandest works of modern times; they are entirely hewn out of the rock. The low-service one holds 240,000 cubic feet of water in five large tunnels, which are filled to a depth of 27 feet. This reservoir lies 150 feet below the surface of the ground, so that the water is always cool. From the Capodimonte reservoirs the main service pipes branch all over the city, forming a network, with close meshes; the supply is continuous, and there are no domestic cisterns. It will be seen that the water is collected under ground, in pure mountainous strata, at a high elevation. All the reservoirs are subterranean, and the water therefore is never exposed to the open air until it issues from the taps or fountains in Naples. Reservoirs and aqueducts are alike thickly lined with Grenoble cement, rendering pollution impossible. The length of the pipes that feed the city from the reservoirs of Capodimonte was, at the opening of the works, 62 miles. Numerous public fountains stand in all the twelve quarters of the city, and flow constantly.

It may be assumed that the memorials of the late President of the French Republic will afford many commissions to French sculptors and architects. For one which is to be erected in Angoulême the subscriptions have reached the 45,000 francs required. The money will be divided as follows, viz. 40,000 francs for the memorial, and 5,000 francs to reward the competitors who have gained the second and third places in the competition. The jury will consist of the following artists:—MM. MERCIÉ, FRÉMIET, FALGUIÈRE, DALOU and RODIN, sculptors; PUVIS DE CHAVANNES and GÉRÔME, painters; COQUARD ET VAUDREMER, architect.

POLYGNOTUS THE WALL-PAINTER.

AT first sight any inquiry about POLYGNOTUS and his works must appear to be one of those barren subjects which are only adapted for the killing of time. Not only are we without an example of his works and are unable to affirm that any vase or gem or wall in Pompeii bears a copy of one, but there is no authentic fact known about his life, no certainty about the time of his birth or death. The more intense the obscurity about a man the keener is the curiosity which he excites, and the discovery of any trifle becomes important. As long as the world remains we may be sure that inquirers will be found who will derive satisfaction in putting together the few fragmentary statements concerning POLYGNOTUS which have survived, in the hope that by some happy accident they may be made to coalesce.

There is a pleasure in the exercise which is rarely found in inquiries of the kind. POLYGNOTUS was the most favoured of painters. In our time a painter can become wealthy, in England he may attain a baronetcy, and in Belgium he may be made a baron. Some have been favourites with princes, RUBENS was an ambassador, and RAPHAEL was likely to have worn a cardinal's hat. But the Greek painter, if the traditions are accepted, could not be treated with more esteem if he had descended from the clouds. A city was honoured by his presence, and critics dare not find fault with his works.

Yet he was not a Greek by birth. POLYGNOTUS was the son of the painter AGLAOPHON, and his brother ARISTOPHON likewise belonged to the craft. They were natives of Thasos, in the Ægean Sea. The island was famous for its gold mines, marble, wheat and wine. The inhabitants were wealthy, and therefore were often invaded. The Persians seized on the island, and after the great war it was excusable that Athens should take steps to insure Thasos against another foreign invasion by taking possession of so fertile a spot, and converting the Thasians into allies or rather subjects. It was some time in the period 476-66 B.C. that CIMON arrived in command of the Athenian fleet. He had already conquered the Persians in several battles, and he was prepared to win at Thasos by arms or by reasoning. His success had refuted those who had nicknamed him "The Idiot," and he was competent to convince others that his indifference to the polite education which Athens offered to its citizens did not unfit him to originate great public works and to lavish wealth on their adornment. CIMON may have thought of POLYGNOTUS when he undertook the armed mission to Thasos, for at that time there was no painter to be found who was so well adapted to realise the commander's intentions to make Athens express its supremacy in Greece by the beauty of its buildings. The painter's father was described by QUINTILIAN to be at least the equal of his famous son, but on that point there can be no certainty. What seems more likely is that POLYGNOTUS surpassed his father. The statement that he had discovered not only a new process, a sort of encaustic, but had departed from conventions is more reasonable. PLINY has preserved the traditions about his venturing to paint open mouths in order to suggest that sounds were being uttered, and his introduction of transparent draperies and multi-coloured headgear in his pictures. The same author also places POLYGNOTUS among the sculptors, and we may conclude that his departures from precedent did not mean any sacrifice of the noble sculptural simplicity which was supposed to be suited to wall-painting. CIMON was not deficient in refinement, and he was likely to be accompanied by men who were competent to give judgment on questions of taste. Their standard would be higher than that adopted by the travelling dealers, who were willing to purchase the works of POLYGNOTUS by balancing gold against them. But there is another circumstance which convinces us that the Thasian artist must have possessed extraordinary ability. Athens was jealous, and was justified in believing it was the home where the greatest of artists, as of warriors, were to be found. The introduction of a stranger to carry out public works was equivalent to saying there was no man among the citizens who was competent for the office. That declaration would be a crime. CIMON was afterwards banished because it was supposed he was well disposed towards the Spartans, and there must have

been good reasons for approving of the selection of a foreign painter.

The causes which induced the painter to quit Thasos can only be guessed. Wealth was more easily gained there than on the mainland—indeed, most of the works of POLYGNOTUS in Athens were painted gratuitously. But Athens then held sway in all that was believed to be noblest for men, and to win renown within its walls was to come near unto the gods. What else but desire of fame could have tempted POLYGNOTUS? If judged by rules of precedence, the emigration was not well advised. Athens and the country around must have appeared to be ill-adapted for the advent of a great artist. Policy had dictated that the ruin and desolation which were among the effects of the war should remain unchanged, as they became the most eloquent incentive to revenge against the Asiatics. But the painter was likely to be informed of the designs of CIMON, and was glad to take a part in the creation of a new Athens. It would appear that CIMON had secured the remains of THESEUS (the faith of that time was easily disposed towards believing in the providential preservation of relics of the Heroes), and the great temple which still exists was erected to enshrine them. It was designed by MICON, who painted on some of the walls scenes from the contests with the Amazons and Centaurs. POLYGNOTUS undertook a subject that was apposite but not familiar, an event in the life of THESEUS which, according to modern notions, would be an unpaintable subject. He represented the Hero proving that he was the son of NEPTUNE by casting himself into the sea, where he was received by the nymphs and conducted to AMPHITRITE, who crowned him. This suggests a series of subjects rather than one. If interpreted with fidelity remarkable powers would be required, but who can say whether conventional or figurative signs and figures were not introduced which would diminish the difficulties of the painter? In the Temple of the Dioscuri POLYGNOTUS painted the Heavenly Twins carrying off the daughters of LEUCIPPUS, a subject which RUBENS long afterwards attempted, and, as we can see in Munich, made out of it the most glowing of all his works. But while the Fleming was content with expressing the moment when the horses were about to start, POLYGNOTUS depicted the whole legend.

In the next work undertaken by the Thasian, he had the co-operation of PANÆNUS, a brother of PHIDIAS, as well as of MICON. This was the painting of the long Poecile Stoa, or double portico, which was used as a general shelter by the Athenians. While his friends selected the Battle of Marathon and one of the Amazonian combats, POLYGNOTUS selected scenes from the siege of Troy. He was an enthusiastic student of HOMER, and his love of the heroic was fostered by the epics. What made his work remarkable in the eyes of many was the introduction (as one of PRIAM'S daughters and a captive) of ELPINICE, the sister of CIMON, and who was said to be the lady love of POLYGNOTUS. His work in the Stoa gained for the artist the citizenship of Athens.

The number of the mural paintings by POLYGNOTUS is not to be ascertained. Some of them were afterwards brought together in the Pinacotheca; but when PAUSANIAS saw them they were greatly decayed. Among the subjects treated were ULYSSES and DIOMEDE carrying off their spoils from Troy; ORESTES and PYLADES; the disguised ACHILLES among the daughters of LYCOMEDES; the Sacrifice of POLYXENA; ULYSSES and NAUSICAA.

The majority of the paintings could not be considered adequate representations of the subjects unless a great many figures appeared. It is evident also that POLYGNOTUS preferred subjects which enabled him to introduce several figures of maidens. May we not then conclude that he often adopted a frieze-like arrangement for his works, and imparted to the figures an ideal character which made them comparable to the sculptured works to be seen in the pre-Phidian era? What ARISTOTLE says about the figures of POLYGNOTUS being superior to natural beings suggests that the painter followed the ideal. But the testimony of LUCIAN and ÆLIAN to his skilful expression enables us to conclude that he avoided both the placidity of some sculptured faces and the smiles of others. Roman writers have related that his scheme of colour was limited to black, white, yellow and red; but with such a palette PLINY'S "capita earum mitris versicoloribus operuit" hardly agrees.

If the artist restricted himself to one plane for his figures, which would not, however, agree with the descriptions of his paintings, a simple colour scheme would not, however, be unsuitable.

(To be continued.)

OLD ST. PAUL'S.*

WHEN Dr. SIMPSON became librarian of St. Paul's some thirty years ago, he was amazed to find there was only one book in the collection which treated of the cathedral buildings. He not only filled the void by collecting over a hundred and thirty books and pamphlets on the subject, but he used his pen to create some additions. His "Chapters in the History of Old St. Paul's," and "Gleanings from Old St. Paul's," were widely appreciated, and he has now, as he says, completed the trilogy by his "St. Paul's Cathedral and Old City Life." We hope Dr. SIMPSON does not suppose he has exhausted his subject. There is much else which can be treated with advantage by a writer who is so loyal to the cathedral, so unbigoted, so impartial, and so genial. At the present time especially, it is wise to endeavour to persuade the citizens of London that St. Paul's has claims upon their bounty, a circumstance which is not so evident as some dignitaries and other good people may imagine.

Important as cathedrals are believed to be in the ecclesiastical system, and most interesting as they undoubtedly are in the history of architecture, it cannot be said that they ever excited the same affection as buildings which, in an administrative as in an architectural sense, were inferior to them. On the Continent, where there are still opportunities to study this phenomenon, we can often see a noble cathedral deserted, while some chapel close by which has no pretensions to be considered a work of architecture will be crowded with worshippers. The cause of the difference may arise from defects in the human mind and its inability to take broad views. A tendency to devotion does not enable an ordinary man or woman to grasp the significance of the purpose of a cathedral, or the necessity of its clergy. Deans, sub-deans, canons, minor canons, prebendaries, precentors and other officials are so elevated beyond ordinary ministers as to scare rather than attract, for traditions of the pains and penalties of ecclesiastical courts hang around them. Then in a cathedral there are so many chapels, chantries and foundations, the mind must be perplexed in deciding between their claims to attention. What is known about the history of Old St. Paul's and of its successor is convincing evidence that neither was regarded with much reverence. The disrespect which was to be witnessed every day, when the cathedral became a sort of Burlington Arcade, for years before the Fire, was no sudden or temporary lapse; there is proof enough it was long growing. As far back as 1411 a proclamation was issued "that no manere man ne child, of what estate or condicioun that he be, be so hardy to wrestell or make any wrestlyng within the Seintuary ne the boundes of Poules." In the reign of Queen MARY there was a public prohibition of the carriage through the building of great vessels full of ale and beer, great baskets full of bread, fish, fruit and such other things, bales of stuff, and also the leading of mules, horses and beasts, thus showing that in those days St. Paul's was treated as a sort of short-cut by carriers and hawkers.

Laymen were not the only sinners. It is evident that the cathedral was also turned to account for their own convenience by the clergy attached to the building. "As the people so are the priests;" and prior to the Reformation Dean COLET testified to the truth of the prophet's words when he said, "In these unhappy and disordered times residence (or holding of canonries) in the cathedral is nothing else than seeking one's own advantage, and, to speak more plainly, robbing the church and enriching one's self." There was so much attention to private interests and so little thought given to the cathedral, it is surprising the building was not consumed at an earlier date. Following too common a precedent, "with the most culpable neglect the authorities had allowed wooden and other structures in contact with the very walls of the cathedral. In one

case a baker had actually excavated an oven out of one of the massive buttresses." The indifference which was exhibited to dangerous things may have been the consequence of an inherited belief among the canons that it was not wise to take things too seriously. The old custom which JOHN GOUGH NICHOLS describes, if considered in that light, would not be without its use among a people who were prone to take their pleasures sadly, although it would seem to be a more suitable spectacle for Friar TUCK's temple in Sherwood Forest than for the cathedral of London. It related to the reception of venison that was contributed as a sort of rent for land in Essex:—

The buck and doe were offered alive at the high altar of St. Paul's with the following very particular ceremonies. The doe was offered on January 25, the day of the Conversion of St. Paul, and the buck on June 29, the day of the Commemoration of St. Paul. The buck and doe were brought on these several days by one among the sitting servants of the family, and at the time of procession and through the midst thereof were offered at the high altar; after which the person that brought the buck received of the Dean and Chapter 12*d.* sterling for their entertainment, but nothing when they brought the doe. The buck being brought to the steps of the high altar, the Dean and Chapter in their copes and vestments were, besides these, adorned with garlands of roses on their heads. After this ceremony they sent the body of the buck to be baked, while the head and horns, being fixed on a pole, were borne before the cross in another procession round about the church till they all issued out of the west door, when the servant or keeper that brought this buck proclaimed its death by blowing his horn, when he was immediately answered by the horns that were about the City, for which they had each of them paid by the Dean and Chapter fourpence in money and their dinner. The keeper during his stay in town was further provided with meat, drink and lodging, and five shillings at his departure, together with a loaf of bread bearing on it the picture of St. Paul.

Churches with very long naves, like Old St. Paul's, offered opportunities for processions, and the clergy would be glad to find occasions for them. That probably was the origin of the venison ceremony, although CAMDEN supposed it was a survival of the worship of DIANA. On the feast of the Conversion of St. PAUL there seems to have been another procession of a more worthy kind, for FOX describes one in 1555 in which "there were fourscore and ten crosses, one hundred and sixty priests and clerkes, who had everie one of them copes upon their backs."

It may be assumed that in processions the dignitaries of the cathedral would appear in vestments that betokened the wealth and liberality of the citizens of London. The riches of the treasury were suggested two centuries ago by an inventory dated 1295, which DUGDALE reprinted in the third volume of the "Monasticon." Dr. SIMPSON in 1887 brought to notice a still earlier list, one prepared in 1245, besides another dated 1402. In the thirteenth century we find the cathedral possessed four mitres; one was "of white, embroidered in purple, ornamented both in front and behind with stars and crescents; in each star was a topaz or an almandine, whilst in the circle surrounding the head were golden plates pierced with trefoils set with peridots, and tau crosses adorned with gems." There were thirty-seven valuable copes. The Dean's was of purple samnite, embroidered with roses, stars, gladioli and crescents, and parts were covered with *tassellis*, or thin plates, on which were figures of SS. PETER and PAUL. The cope of RICHARD OF ELY was also of white samnite embroidered with leopards and flowers. The Chancellor's was of black samnite with vine leaves, griffins and birds. Bishop WILLIAM's cope was green, with a figure of the Blessed VIRGIN in front, angels bearing censers, archers, &c. The Archdeacon's cope "possessed a hood sewn with pearls, on which was inscribed the name of the Archdeacon, its silver morse set with precious stones, and in the midst an engraved cornelian, whilst the silver-gilt crest of the morse was adorned with engraved sapphires." On the cope of one of the prebendaries the *tassellis* bore a view of Windsor Castle and a portrait of the owner standing at an eagle lectern before a bishop. It was evidently considered becoming that red should be most often used in a martyr's church, for there were fifteen precious copes of that colour while there were no more than two of white, nine red chasubles and three white, eleven ordinary copes and eight white. By 1402 the proportions were altered, for there were fifty-nine copes, twelve chasubles and thirty tunicles of red, and forty-one copes, fifteen chasubles and sixteen tunicles of white. Blue is not mentioned in the early inventories, and is not now

* *St. Paul's and Old City Life.* By W. Sparrow Simpson, D.D., F.S.A., Sub-Dean of St. Paul's Cathedral, &c. Elliot Stock.

used in vestments; but in 1402 there were twenty-seven copes, seven chasubles and twenty tunicles of that colour. In the two lists we find evidence that the ornamentation of the vestments was not always of a kind that could be called ecclesiastical. For instance, the six copes presented by ANNE OF BOHEMIA were "embroidered with golden falcons and with her arms," and among the gifts of JOHN OF GAUNT were copes of cloth of gold and red velvet, adorned with lions and a stag lying in each of the collars, some powdered with golden leopards and some "semées with golden roses and white ostrich feathers." The hangings were also beautiful. The church plate was of gold and silver, and we may be sure included examples by the ablest artists. Among the latter were the cross and images presented by Cardinal BEAUFORT. Dr. SIMPSON, when describing the contents of the treasury, offers a few remarks which should be considered when the shortcomings of the clergy are discussed:—

It is specially observable that many of the ornaments and vestments were, as were also many of the chantries, the gift of the clergy of the church. It is for ignorant and vulgar minds to speak of the clergy of the time as extorting from the laity, under the dread of mysterious penalties, the precious gifts and endowments which were so freely given; but at least it must be remembered that the clergy themselves were generous givers, and the records of the treasures may be put in evidence.

The treasury of St. Paul's, being the nearest, was the most tempting of all to HENRY VIII. and his minions. It was cleared out and the cathedral transformed with remarkable expedition. A year afterwards a few things were presented to the Dean and Chapter which were remarkable on many accounts. Among them were twenty-four old cushions to kneel on, five towels, thirty albs to make surplices for the ministers and choristers; but also "a large canopie of tissew for the King's Majestie when he cometh thither," "bawdkins of divers sorts and colours for garnishing the quire at the king's coming, and for the bishop's seat, &c." HENRY did not forget that his dignity was to be expressed under all circumstances. In the reign of MARY, one of the queen's chaplains, Dr. GLASIER, spoke about the confiscation and implored his auditors to send back the property which had been removed. "I exhort you," he said, "and require you to restore and bring home again such jewels and ornaments as you have unjustly taken away from the churches. Indeed, it were a great shame for so many of you to lie in beds and sit upon cushions made of the church stuff, for which you have paid either little or nothing at all, and the temples and churches of England to stand so naked and so bare as they do." There is no record that the citizens were conscience-stricken and responded to the appeal.

In the third year of ELIZABETH's reign, or 1561, the steeple was set on fire by the agency of lightning and all the timber and lead-work was destroyed. Without delay the Corporation "very frankly and loyngly and wyllnglye" granted three thousand marks towards the restoration, and appointed an alderman and two commoners to be surveyors of the work. That repairs were needed in the next reign is seen from the appointment of commissioners for that purpose by JAMES I. They seem to have employed Portland stone, which was then apparently a novelty in the London market. This fact is demonstrated by extracts from a curious little book of verse entitled "Portland Stone in Paules-Churchyard," which was "written by HENRY FARLEY, a Freeman of London: who hath done as freely for Free-stone, within these eight yeares, as most men, and knowes as much of their mindes as any Man." The geography of the British Isles could not be then taught in schools, for the author has to inform his readers that Portland is in Dorsetshire. There were many writers of verse in those days who were superior to Master FARLEY, but on the subject of masonry he possessed more knowledge, and was not ashamed to display it. The following explanation by some blocks from Portland would not be so interesting if it were more refined in style:—

Ere since the Architect of Heauen's fair frame
Did make the World, and man to vse the same;
In Earth's wide wombe, as in our nat'rall bed,
We have beene hid, conceal'd and covered,
Where many thousand ships haue sailed by,
But knew vs not, and therefore let vs lye.

Till at the last, and very lately too
(Some Builders hauing building to doe,

And time being come we could no longer tarry,
But must be borne from out our earthly quarry)
We were discover'd, and to London sent,
And by good Artists tryde incontinent;

Who (finding vs in all things firme and sound,
Fairer and greater than elsewhere are found;
Fitter for carriage, and more sure for weather,
Then Oxford, Arcafter, or Beerstone eyther,)
Did well approue our worth aboue them All
Vnto the King for service at Whitehall.

It was not only masonry that was looked after under JAMES. In 1620, it is recorded the king visited the Cathedral to see three great windows which were newly glazed in rich colours with the story of St. PAUL. When LAUD was appointed bishop of London, with characteristic courage he resolved to undertake the restoration of the building. He was able to obtain the authority of CHARLES I., and the citizens and companies were called upon for contributions. The Saddlers' Company, the Skinners' Company, the Barber Surgeons' Company and the Brown-Bakers' Company agreed to become subscribers, and we may assume they were not alone in giving their aid. The first work undertaken was the erection of INIGO JONES's western portico. When the Civil War broke out the building was utilised as a barrack for the Parliamentary troops, and the precincts turned into a skittle alley for their benefit. The 17,000*l.* which had been collected for restoration was seized. It was a disappointment for INIGO JONES to lose an important commission, but a worse fate awaited him, for he was charged with delinquency as he had not paid the contributions demanded by the "Committee for the Advance of Money," which in London amounted to one-twentieth of the real property of residents and one-fifth of their personal estate:—

Sir Inigo Jones, Delinquent, Martin's-in-the-Fields, was very vigorously dealt with by the committee. He was assessed at 1,000*l.*, and, as it appears, endeavoured to remove some of his goods out of the jurisdiction of the committee; for on April 25, 1645, the waggons seized in his house were ordered to be delivered up. They were ready packed with furniture and goods. On October 20 it was directed that he should be brought up in custody to pay his assessment. On January 9, 1646, information was laid of goods, plate, money, &c., belonging to him, concealed in his house near Whitehall, or in some rooms in Scotland Yard belonging to him. On January 12 it was ordered that his house should be visited, his goods seized, sequestered and inventoried; on May 15 he was directed to pay in on the following Monday half his assessment for his one-twentieth; on May 25, having paid his half assessment, he is respited fourteen days; and on June 8 his assessment is discharged for the 500*l.*, he paying, in addition, 10*l.* officers' salary.

Was it the intention of Parliament to allow the building to become so dangerous that its demolition would be necessary? Some policy of that sort would seem to have inspired the action of the Council of State about the scaffolding. In 1653 an order was made that the whole of the timber must be sold and the proceeds utilised for the contingencies of the Council. The scaffolding helped to shore the building. After its removal a part of the roof fell down in 1654. Thereupon the Corporation applied to CROMWELL for the lead, in order to convert it into water-pipes. If there was any intention to preserve the building that request would hardly be made. Twelve years afterwards restoration was rendered unnecessary and WREN's opportunity arrived.

Dr. SIMPSON on the present occasion has not introduced more than a few incidents that relate to the existing building. But in compensation he gives the following interesting statement concerning the varieties of stone and marble employed in the cathedral:—

In a manuscript preserved in Lambeth Palace Library (No. 670), containing some account of the rebuilding of the Cathedral after the Great Fire of 1666, I find that the following kinds of stone are enumerated as being used in the works:—Denmark stones, white and red; Burford and Headington, in Oxfordshire; Beer, Caen, Reigate, Ketton, Tadcaster and Guildford; Kentish Hassock and rubble, Ragstone, Swedish, Irish marble, Purbeck paving, white veined marble for pillars, &c. *Paving*:—Welsh and Torbay. Mr. Penrose, the surveyor of the Cathedral, has been so good as to send me a list of the marbles which to his knowledge have been used in the more recent constructions and repairs of the Cathedral. It is as follows, omitting the ordinary white and greyish Carrara marble. *The Pulpit*:—The yellow is mostly Siena, but there is a little of the ancient Giallo Antico, brought from Rome. The green is Greek; from the Isle of Tenos. The red columns, Cork marble. The dark purplish columns, Anglesea. The grey columns, Plymouth. *The South Transept*:—The columns, Rondone, a district of Serravezza, near Pisa. The plinths, Ippelen, Devon. *The West Front, the Landing to the Great Steps*:—The red is Greek,

from Laconia, supposed to be the quarries of the Rosso Antico. The dark grey, Porto Venere, near Spezia. *Dean Milman's Monument* :—The panels, Serpentine, from Levanto, near Genoa. *The New Steps* :—Dark Syenite, a kind of granite from Guernsey. *The West Area Posts* :—Granite, from the quarries of Shap, in Westmorland. *The Black Marble for Pavements* :—From Polash in the Isle of Man. *The Green Marble used for the Pilasters in the Apse* :—From Varallo, North Italy.

We look upon Dr. SIMPSON'S "St. Paul's and Old City Life" as almost a model book on an archaeological subject. It belongs to the class of which M. THIERRY'S "Récits des Temps Mérovingiens" is the leading example. There is no effort in the pages to sacrifice accuracy to an apparent completeness that must be delusory. What Dr. SIMPSON gives can be accepted literally, and be employed as materials for mental pictures of many of the scenes which were transacted within and around Old St. Paul's.

THE ORIGIN OF GOTHIC ARCHITECTURE.*

THE ornamental arts are a continuous development from certain primary forms or motives. The originals, or the derivatives, were made by primeval man as a means of delineating certain sensations or experiences that were newly discovered by him, or of which he became mentally conscious for the first time. It was the opening of a new field of exercise for human endeavour. The architectural art is a divine record of the progress of humanity. The soul speaks in art that of which the mind is unconscious. That which is known, the past, is detailed by knowledge; that which is not known, the future, is expressed by the soul in the poetries.

The first diagrammatic illustrations made by man proceed at once upon diametrical paths of development. One of these is literal representation and the other illiteral. The former is the systematic progress that develops into alphabets. The latter is the cultivation and expression of faith. It is ornamental as opposed to the useful. In the course of man's advance in development he establishes an ideal that is beyond his comprehension. Both courses of progress are finally directed upon this imaginary ideal, which has become a standard that draws them together until literature and art are united in poetical expression. This is a combination from which a higher consciousness may begin a repeated development in a similar manner. That portion of humanity which has laboured in the progress acquires a new comprehension. The delinquent ones continue the progress under changed circumstances.

Greek art marked a final possibility of man's mental growth. Beyond their refinement of what is known as classic detail of ornament the designer cannot go. Neither can mind exceed in their philosophical comprehension. Modern intellectual development is simply a repetition of their progress in the development of their reasoning powers. Owing to other circumstances facts are more varied, but mental power is not now any more comprehensive. Greek ornamental derivatives originated in the representations of material sensations. By discipline a state of involuntary exercise was arrived at in both the literal and illiteral branches of development. They were finally united in translating the Greek ideals of faith. This combination in poetry and sculptured architecture was a mental exhibition of their ideas of the one supreme power. From this apex of development the new and higher process of emotional growth began. The completion of the intellectual circuit made a higher plane available. The work proceeded upon that plane, and they who had not obtained full mental growth had additional labour to perform. The mentally perfect gradually disappeared with the disappearance of faith.

The higher experience which the world entered upon nineteen centuries ago was emotional expression by its mastery and comprehension. It was the beginning of a power as much superior to the intellect as the mind is superior to the physical man. Gothic architecture and ornament is the natural expression of a progress of this new growth. Gothic art and all art, it must be remembered, is the opposite of religion, as commonly understood. The modern symphonic drama is its culmination, and bears the same relation to this new sphere of exercise as the Pantheon, created by the Greeks, did to their accomplishment. The old philosophical process, best represented then by Socrates, accompanies it as the natural mental condition of the present.

The principal orders of architecture are Mohammedan, the feminine; Grecian, the masculine; and Gothic, an expression of both. Roman, Romanesque, Byzantine and many other styles are variations upon the principal themes. The Eastern and the Greek schools of design have their points of departure. The Gothic form of architectural expression appeared in Europe with its detail already developed into architecture. All things have a first cause. If the origin of Gothic ornament is

not in Europe it must be in some other country. If not on this earth, it must be on some other planet. Art is unconscious development and cannot differ from the usual system, neither can it deceive. Even a study of the Chinese language in relation to architectural ornament will prove this same rule. Classic ornament began in the delineation of material sensations. Owing to a necessarily higher condition, Gothic ornament must have begun in a delineation of mental sensations. From this point development would finally arrive at the control of emotional expression in a distinct medium without the intervention of thought.

According to all authorities, the architecture and ornamentation of Central America is without precedent or connections. It had its isolated beginning and progress until the extinction of its practitioners. It is independent of the fundamental characteristics of other styles. The origin of Central American art is so undoubtedly recent that it must be the beginning of this superior plane of experience; the world as a whole never presents opportunities for degeneration; that is natural law. Only one opening is left here for a point upon which to attack the subject. The ornamental forms had their beginning in the illustration of mental facts or conditions first realised. Language was too imperfect a means of demonstrating the circumstance. Language fails when the emotions are stirred, and such was the case here in its primeval form. Through their emotions an influence acted upon their minds and their impressions were pictured in clay. The first erections may have been temporary, and afterward more or less permanent. Gradually they were adapted to use, and the means of expression became architecture with new decorations.

The ornamental motives of Central America are derived from figures of the Latin cross, the shepherd's crook, the fish the stairs of ascent and the reptile. The latter is a representation of an eel that once inhabited the waters of the neighbouring seas. It is distinguished by a dorsal fin upon the head. In their representations it has the rattles of the rattlesnake. The trinitarian character of man or their deities is indicated in various manners. The representation of sound waves plays an important part, and under circumstances that indicate that interpretation. One rebus may read that a people divided are united by the voice of God. The cessation of tribal hostilities, a short time before the Spanish invasion, seems to have been under the influence of this idea. Their manner of offering human sacrifice by cleavage may also have been its corruption. All ideals are debased by mistaken religions. Taking the matter as a whole, they were affected by Christian notions. So much for the original derivatives.

Literal development in this case was imitative representation of nature, and finally conventionalisation. The tooth ornament, beak-heads, and ball and star mouldings of Gothic art were here invented. The cruder forms correspond to inexplicable characteristics of Irish architecture. The Norman detail, with its nebule embellishments, is a perfect continuation of the transatlantic ornaments. The pointed arch also has its beginning in pictorial use. The dates of execution assist in establishing the consecutive growth of this art from one country to the other.

The illiteral development of Central American architecture is the expression of the artist-sense, feeling. It is the underlying power in humanity, the control of which leads to emotional expression. It is the truth in æsthetics and the quality of character. The architecture of the North American isthmus is dignified and serious. In pyramidal development, in stairs and terraces, a desire for attainment and ascent is expressed. The emotional expression of the pyramids of Egypt is concealment, here it is proclamation. They strove for a closer contact with that higher knowledge or sense that was dimly beginning in their consciousness. Their work abounds with that feeling that prompts an effort for greater height. Emotional influences control the mind, and thence the labour of the hand. Their work as a whole was under the influence of a longing to surmount. That is also the emotion of the Gothic cathedral—aspirational ascent.

Architectural ornamentation expresses the esoteric growth of man. He is not conscious of this until it bursts upon him after accomplishment. There may be more truth read from ornamentation than appears upon the surface.

Mohammedan and then Greek, and finally the cathedral architecture flourish upon the purity of their original inspirations, even though one may seem comprehensively above the other. Modern art, in proportion to the successful adaptation of precedents to exigencies, expresses the sincerity with which humanity endeavours to approach the truths of life. That recovery is the mainspring which will begin the transformation of the coming world of thought and art. Man is slow in believing what is understood with difficulty. Truth is never proven so quickly as by those who try to disprove it. The fact of the origin of Gothic architecture can be better demonstrated by such as have the leisure for archaeological research.

* A paper by Mr. C. Bryant Schaefer, published in the *Inland Architect*.

TESSERÆ.**The Art of the Arabs in Egypt.**

THE potent influence both for good and evil of the Muslim faith upon Arab art, deadening and almost nullifying in the case of painting and sculpture, but elevating and ennobling when brought to bear upon their architecture, renders it difficult to assign to it a just position. In this respect the art of the ancient Egyptians, of Greece and Rome, and the development and application of art in India and China present a marked contrast. In these latter countries the religious faith of the people has greatly influenced their treatment of painting and sculpture, and in the case of the Greeks especially has afforded to it a vitality which has exerted a powerful influence over the culture and civilisation of the world. Christian art, subjected, at least in modern times, to trammels similar in kind though less in degree to those imposed upon the Arabs by their religious prejudices, has never lost its hold upon the nations of Europe, nor has Puritan zeal even in Protestant England succeeded in effacing the influence it yet continues to exert. Thrown back upon the resources which were yet at their command, the Arabs concentrated their energies upon architecture, and their inventive faculties developed almost a new art in the style of decoration which lends so much grace and beauty to their buildings. It is a significant fact that the obstacles which have arrested the full development of art amongst the Arabs should have fostered the growth of a style of architecture so admirable in its adaptability to the ends which it subserves, and yet appealing at the same time to the sympathies of men alien to the creed and institutions under which it flourished. Persian art, less under the influence of these restrictions, inasmuch as it admits under a modified form of the rendering of natural objects, has never, at least in architecture, reached the perfection attained to by the Arabs, who have made Egypt a central point for the erection of their noblest monuments. The mosques of Cairo and the examples of domestic architecture which yet remain are evidences of the high position attained to by their designers, and justify the dismay with which their neglected condition fills the minds of all who are capable of appreciating their beauty. It is a sad commentary upon the boasted civilisation of a century now drawing to a close that no hand has yet been lifted to avert the doom of some of the choicest monuments existing in the world. The surpassing interest attaching to the remains of ancient Egypt has to some extent thrown into the shade the products of a later phase of civilisation. The mystery which enshrines the monuments of a race so long extinct, their simple grandeur and their enduring strength, have drawn towards them the attentive study of some of our highest intellects. The key to the right understanding of their inscriptions has been eagerly sought after, and the almost unlooked-for success attending their anxious search has afforded a fresh impetus to the prosecution of labours to which the Government have lent their tardy support. Thus we no longer hear of temples quarried out in order to provide material for a tawdry palace, or of their columns being burned for lime—a proceeding connived at by several of the late Viceroy's of Egypt.

The Cancellaria, Rome.

The Cancellaria is a pile of imposing magnitude, and remarkable for its spacious cortile, surrounded by open galleries formed by ranges of arches resting upon granite columns. Although such a combination of the column and arch constitutes in itself a mixed style, as it was here managed by Bramante it is at least free from absurdity, for he suppressed all appearance of entablature, and made his arches spring immediately from the abaci of the columns, which with the capitals may be considered as the impost's surmounting circular instead of square piers; whereas blocks made to resemble pieces of an entablature not only cause the supports to look too much as if built up of fragments, but call attention still more forcibly to the inconsistency of the two systems of architecture by exhibiting the horizontal members, which columns were originally intended to support, so mutilated as to destroy all idea of connection in a horizontal direction. We may therefore so far allow that Bramante proceeded upon rational principles, and likewise that he consulted effect no less than propriety, the mode adopted by him being more satisfactory to the eye as well as to the judgment. In the façade of the same building, which has two orders of pilasters above a lofty rusticated basement, he was not so happy, and he either did not aim at the character of the antique or else failed in his attempt. In proportion to the building the orders are too minute to assist the idea of magnitude otherwise than at the expense of their own importance. There is magnitude in the general mass, but not in the constituent features. The arrangement of the pilasters again is more unusual than agreeable, for they cannot be said to be coupled, but distributed so as to form wider and narrower intercolumns alternately; in the former are placed the windows, while the others are left blank, a mode which, without possessing the richness of coupled columns or pilasters, is equally if

not still more objectionable than they are. Another circumstance which does not contribute greatly to beauty is that the windows of the principal floor as those of the basement are arched, although crowned by a horizontal cornice, owing to which they have a heavy look in themselves, and also appear squat and depressed in comparison with the range above them. Nearly the same peculiarities, which may be taken as in some degree characteristic of Bramante's style in buildings of this class, prevail also in the façade of a palace begun although not finished by him, in the street called Via Borgo Nuovo. This mansion, now called the Palazzo Giraud, has, like the Cancellaria, two orders of pilasters, forming narrow and wide intercolumns alternately, and arched windows to the first order, crowned by a horizontal frieze and cornice, but with these differences, that the lesser intercolumns are narrower than in the other instance, although still of too great width to allow the pilasters to be termed "coupled," and the arched windows are there wider and loftier than the others.

Rusticated Masonry.

It is an error to suppose that rusticated work is incompatible with elegance and elaborate finish. It is true that it admits of great rudeness and severity of character, but it also admits of the most studied and elaborate finish. So far, too, from requiring less care and accuracy than usual, the arrangement of the courses and rustics so as to combine them in perfect symmetry with arches, windows, &c., is a work of more thought and labour than would suffice for designing half a dozen Grecian porticoes. Much of the beauty of rusticated fronts depends upon the form and proportions of the arches or openings, and on the arrangement, &c., of the rustics which form the voussoirs either to arched or straight-headed windows. Occasionally moulded archivolts are substituted for radiating voussoirs, but the effect is not good, because they cut the horizontal joints of the courses very disagreeably, which, it may be observed, is likewise the case where the voussoirs form an extrados either concentric with the arch or making a more elevated curve, as in most of the Florentine examples. It is far better to make the voussoirs elbowed, so as to unite with the horizontal courses, whereby the whole looks firmly bonded together. Sometimes impost's to arches are omitted altogether, or if there be such member it is usually a mere plat-band, although occasionally it is moulded. In arches the keystone may either be similar or distinguished from the other voussoirs, which last may be done in a variety of ways, although the most usual one is to cut it into the form of a console, or else enrich it with a mask sculptured upon it, of which kind are the keystones to the arches of the Strand front of Somerset House, representing the nine principal rivers of England personified as old men. "Bossages" is a term more particularly applied to rusticated cinctures on the shafts of columns, which may be either square or cylindrical, but should not greatly exceed the diameter of the shaft itself, more especially in the former case. Columns of this kind ought invariably to be engaged, and the wall behind them of course rusticated also. In such case the cinctures serve as ligatures to bind and incorporate them with the rest, whereas insulated columns with blocks upon their shafts are equally unmeaning and uncouth. The same remark applies to rustic blocks stuck at intervals upon the architraves of doors and windows, as, for instance, those of St. Martin's Church, London, although there is no rustication in that building. Of columns with bossages or rusticated cinctures, the two arches within the court of Somerset House are a tastefully-designed and well-executed example.

Alderman Boydell.

John Boydell was designed for the profession of his father, that of a land surveyor, to which for some time he attended; but having, it is said, accidentally seen a volume of views of country seats by Baddeley, his taste was developed, and he resolved to become an engraver. He accordingly proceeded to London, where, though at the age of twenty-one, he bound himself for seven years to Tomms, the engraver, for the purpose of learning the art. At the expiration of his apprenticeship he published by subscription, in 1746, a volume of his own engravings, consisting of one hundred and fifty-two views in England and Wales, price five guineas. They are now interesting chiefly as an indication of the imperfect state of the art in England at that period as compared with the improvement effected afterwards by his own exertions. Indeed he never himself excelled as an artist, a fact which his judgment and candour induced him often to acknowledge. These humble specimens served, however, to commence a very long and continuous course of prosperity, for with the profits of this publication he entered into business for himself as a printseller, and by the adoption of a very liberal policy in employing and amply remunerating the best artists of the time, he gradually extended his speculations, and acquired a large income and a great reputation as an enterprising and generous patron of genius. He engaged Woollett to engrave the celebrated pictures of *Niobe* and *Phaeton*, paying for the former 100

guineas and for the latter 120. They were sold by Boydell at 5s. each, but have since at auctions produced 10 and 11 guineas. In short, he contrived to employ every aspirant to distinction whose energies wanted encouragement. When Boydell began business there were no very eminent English engravers, and they were generally inferior to those of the Continent. Our foreign commerce in this department consisted wholly in importations, and the cabinets of collectors were principally furnished by the artists of France. But when, after many years of persevering exertions, Boydell succeeded in forming an English school of engraving, the circumstances were reversed, for the importation of prints was almost entirely discontinued, and a large exportation ensued. Holland, Flanders and Germany were the principal markets in which the engravings of Boydell were in demand. The complete success of his patronage in the province of engraving, and his indignation at the opprobrium which foreigners cast upon his countrymen for the deficiency of their taste in other departments of the fine arts, led him to attempt a similar improvement in the art of painting. For the accomplishment of this design he secured the services of all the first artists in the kingdom, and selected for illustration the works of Shakespeare, as supplying the most appropriate subjects for eliciting and displaying the abilities of each individual. An English school of historical painting was thus established. West, Opie, Reynolds, Northcote and others were all employed. Spacious premises were purchased in Pall Mall, where, in the famous Shakespeare Gallery, those paintings were exhibited for several years. The beautiful plates which, under the liberal patronage of Boydell, were engraved from these numerous paintings, form a magnificent volume in royal elephant folio. In 1804 at the advanced age of eighty-five, and having, in consequence of the commercial obstacles occasioned by the wars of the French Revolution, become involved in unavoidable difficulties, he obtained an Act of Parliament enabling him to dispose of the paintings of his Shakespeare Gallery by a lottery. In the memorial of his situation he states that his enthusiasm for the promotion of the arts induced him to lay nothing by, but to employ continually the whole of his gains in further engagements with unemployed artists; that the sums he had laid out with his brethren in the advancement of this object amounted to 350,000*l.*, and that he had accumulated a stock of copper-plates which all the printsellers in Europe would together be unable to purchase. He lived only until the last ticket of his lottery was sold. The affair was finally decided subsequent to his death on December 12, 1804.

The Greek Painters and Perspective.

That painting in Homer's time was still in its infancy is not only supported by the authority of Pliny and other writers, but is grounded upon the decisive proof afforded by the works of art enumerated by the ancients, that many centuries later art had not advanced much further, and that the paintings of a Polygnotus, for instance, would be far from able to sustain the test which Pope believes the pictures in Homer's "Shield of Achilles" are capable of undergoing. The two large pieces of this master at Delphi, of which Pausanias has left us so minute a description, are plainly devoid of all perspective. The ancients possessed no knowledge of this branch of art, and what Pope adduces to show that Homer had some idea of it only proves that his own ideas of it were of the most imperfect nature. "That Homer," he says, "was not a stranger to aerial perspective appears in his expressly marking the distance of object from object; he tells us, for instance, that the two spies lay a little remote from the other figures, and that the oak under which was spread the banquet of the reapers stood apart. What he says of the valley sprinkled all over with cottages and flocks appears to be a description of a large country in perspective. And indeed a general argument for this may be drawn from the numbers of figures on the shield, which could not be all expressed in their full magnitude, and this is therefore a sort of proof that the art of lessening them according to perspective was known at that time." Mere observance of the law, derived from optical experience, that a distant object appears less than a neighbouring one is far from constituting perspective in a picture. Perspective requires a single point of view, a definite, natural horizon, and it was in this that the ancient paintings were deficient. The ground in the pictures of Polygnotus was not horizontal, but was so excessively raised at the back that the figures which ought to have stood behind appeared to be above one another. And if this position of different figures and of groups of them was universal, as seems to be shown by the ancient bas-reliefs, where the hindmost figures always stand higher than and overlook the foremost, it is natural to assume that it is employed in Homer's description, and that those of his designs which in accordance with this practice can be combined in a single picture are not needlessly separated. Consequently the twofold scene in the peaceful town, through the streets of which a joyous wedding procession moves, whilst a weighty lawsuit is being decided in the market-

place, does not necessarily involve two pictures. Homer certainly might easily think of them as one, since he pictured the whole town from so high a point of view that he could obtain an uninterrupted view of the streets and market-place at the same time. Real perspective in painting was discovered, as it were, experimentally by means of scene-painting, and even when this last had reached perfection it must have been still far from easy to apply its rules to a picture painted on a single surface. At any rate, in the paintings of a later period among the antiquities of Herculaneum such numerous and manifold offences against perspective are to be found as would not be pardoned even in a novice.

Metrical Repetition.

There is one source of pleasure in all the arts, concerning which much doubt may arise whether it is to be classed among the pleasures of sense or above them. This is the beauty of equal-timed or equal-spaced repetition. It applies equally to the eye and the ear, substituting space in the former case for time in the latter. The unmixed operation of the principle is seen in children placing objects in a line at regular distances, or repeating a set of unmeaning syllables over and over again to weariness. Yet the same principle is carried into the highest arts, and leads to the rhythm of poetry or the equal spacing of the windows of a palace. In examining its nature it may be urged, on the one hand, that as isochronism in vibrations, whether of sound or light, pleases the organ of sense and not the mind (since it cannot possibly follow or distinguish such rapid pulsations), so we may infer that the same property in these far less frequent repetitions pleases us in the same manner, and is therefore not to be classed above more sensuous beauties. On the other hand, it is remarkable that the beauty of a line of equidistant objects (a colonnade, for instance) is universally admitted to be increased when it is seen obliquely, that is, when the perspective images formed in the eye are not equidistant. Thus it would seem they are not so pleasing when seen to be equidistant by the eye as when they are only perceived to be equidistant by the mind; and this would lead us to rank this source of beauty among intellectual ones, for we have something like a reason to advance on this side of the question against a mere analogy on the other side. The chief charm of this quality in architecture is to be traced to its expression of courtesy and consideration for the spectator. For everyone must perceive that in a modern complex building the openings cannot be equally spaced, and at the same time made to suit the internal requirements without a great deal of thought and contrivance, not a particle of which is thrown away, but always leaves its stamp on the work, and the quantity of which constitutes the value of every work of art. Nothing is more essential, therefore, to the first aim of architecture than this equal spacing; every deviation from it, without any reason appearing externally, is an obvious sacrifice of the spectator to the idol self, and hence a breach of courtesy, and if very glaring, an insult.

Mediæval Seals.

The age of English Mediæval seals, which are never dated, may be approximately discovered from the style of lettering of the marginal inscriptions or legends. From about 1066 to 1175 Roman capitals were used; from 1175 to 1215, rude Lombardic capitals; from 1215 to 1350, good Lombardic; from 1350 to 1425, bold black letter; from 1425 to 1500, fine, close black letter; and from 1500, Roman capitals.

Architecture and Imitation.

Architecture is in the strict sense of the word the art and science of raising complicated and handsome buildings, and the Germans are quite right in calling it *Baukunst*. The mere construction of a building is for the most part, if not entirely, a work of science; but in ordering the disposition of parts which make it a handsome building there is an opportunity of showing taste and exercising artistic discrimination, and it is thus that architecture assumes the dignity of an art. So far the architect has drawn no inspiration from nature. The formation of his ground-plan, his elevation, his roof, his gables has nothing to do with nature. They may be geometrically shaped for scientific reasons, but the different parts are constructed by science to suit necessity or convenience, and architecture, as an art, has nothing to do but to group and arrange them tastefully and judiciously. It is plain therefore that architecture proper has not for its object, like sculpture and painting, the imitation of forms external to itself. The ornamentation of buildings involves an appeal necessarily to the sister art of sculpture, and frequently, if not necessarily, to that of painting. As Professor Donaldson, president of the Institute, observed, architecture cannot very well exist without the other arts. But as soon as the architect shapes a moulding in a doorway to obviate the bareness of the splay, he invokes the aid of sculpture, and the imitation introduced in this and any other ornament belongs to the art that brings it in, and not to architecture proper.

NOTES AND COMMENTS.

THERE is no country in which a stronger affection for ancient graveyards is exhibited than in Ireland. It must be allowed that the affection is not of much account in upholding the amenity of the burial-places, which are generally left in a most neglected condition. But the island abounds in anomalies. When the graveyard is attached to an old abbey or church, as is generally the case, the interments interfere with the preservation of the ruins. A case of the kind is now under the consideration of the Local Government Board. At Sligo a part of an ancient monastery has survived which includes three sides of the cloisters, the walls of the church, with a fine east window. The place was recently made over to the Irish Board of Works in order to preserve the ruins, under the Ancient Monuments Act. Sir THOMAS N. DEANE, R.H.A., reported on the condition of the ruins, which are neglected, and are likely to suffer grievous injury from the use of the grounds as a cemetery. The cloisters are now almost concealed, owing to the elevation of the soil and the height attained by the weeds. The Commissioners of Works can expend money in upholding the masonry, but they have no power to interfere with interments. Expenditure on conservation would, therefore, be wasted, for as long as the present system of burial continues the walls are in danger. A great many of the inhabitants are opposed to interference with the graveyard, while the medical officer of health considers that if there is not a change it will become a public danger. The Corporation of Sligo have no authority to undertake the care of the place, the power of the Commissioners of Works does not extend beyond the remains of the buildings, and the Local Government Board must be inactive because the ground is not a cemetery duly placed under official control. In the embroglio, it is to be hoped the ruins will not suffer.

THE parliamentary committee of the Manchester City Council have made several suggestions with respect to the adoption of the principle of "betterment." One is that the person appointed by the Local Government Board, prior to the commencement of the improvement, to make the valuation of the properties, is to hear all parties interested, and their expenses, as fixed by the Local Government Board, are to be paid by the Corporation, in addition to the cost of the valuation. Another is that the betterment assessment is to be made by the Corporation not sooner than twelve months nor later than three years after the completion of the improvement. Any person objecting to the assessment may claim to have it determined by a jury instead of by the arbitrator. The costs of the arbitration or the inquiry before a jury are to be paid by the Corporation, unless the award be for the same amount of betterment as that assessed by the Corporation or a greater amount, in which case each party shall pay their own costs and one-half the costs of the arbitrator or jury. Another amendment of the Bill is that an owner or lessee upon whom the betterment assessment is made may claim to set off any worsenment arising from the improvement in respect to other property of his in the immediate neighbourhood. The determination of this question devolves upon the arbitrator. Provision is introduced by which the betterment charge may be redeemed at thirty-three years' purchase. Another addition is that the owner, or a lessee having not less than twenty-one years' unexpired, has the right of notifying to the Corporation his requirement that they should purchase the property comprised in the betterment charge at the price stated in the initial valuation. The Corporation must then determine whether they will purchase the property or abandon the betterment charge upon payment of the expenses incurred.

A FEW alterations have been made in the prescribed work for obtaining art master's certificates under the Science and Art Department. In group 1, subject 8, an outline of the figure from the cast, it is said "the drawing should be a careful and accurate rendering of the contour of the figure and of such of the forms within the contour as can be rendered, or in some measure expressed, by a line." For subjects 14 and 22 will be required "a study, in colour, of a growing plant from nature, not pictorially represented

(i.e. with accidents of light and shade), but simply and directly drawn, with details (separately if required) selected by the student as being characteristic of its growth and suggestive of ornament, together with three designs based upon the plant. These designs must occupy, in a decorative way, a square, a circle and an oblong. One of them must be in monochrome, one in two colours, and one in polychrome. In each case the plant must be not merely composed into the given space, but treated in accordance with decorative conditions." Among the works required in group 11 are "a set of fifteen studies of ornamental design, showing the treatment of diapers, friezes, borders, panels, pilasters, &c., from original examples in colour or relief, either in the South Kensington Museum or elsewhere. The date, style and local origin of the example must be given on each sketch, and the series should analytically illustrate modifications evolved during various periods." Also "a drawing of a flowering plant, with three distinctly different designs for patterns based on the plant. Each of these three different designs must be suited to the technical requirements of one of three different processes of manufacture; such, for instance, as embroidery, inlay, printing, wrought metal, weaving, painting, &c. The process and material for which it is intended must be named on each design. One at least of these designs must be executed in body colour or tempera." Another, and for some a more difficult, test awaits the candidate in group 3. He will have, besides other drawings and paintings, to prepare "two drawings in outline of the same antique figure or living model, or of one or two photographs from nude figures by M. ANGELO in the Sistine Chapel; within one outline the bones of the figures are to be indicated, and within the other the muscles," besides "a design, drawn or painted, of ornament and human figures as applied to decorative or industrial art. This design should be not less than 15 inches in its longest direction. It is essential that human figure should form an important feature of the ornament designed." In all these exercises it is evident that candidates who have not mastered principles are not likely to succeed.

IN England few but those who have a personal interest in processes retain much faith in sewage utilisation. The aim seems to be now to discover the least costly means of getting rid of sewage. In America people appear to be more sanguine. Mr. G. E. WARING, C.E., who has a reputation as a specialist, in his "Modern Methods of Sewage Disposal" (SAMPSON LOW, MARSTON & CO.) says that "the possibilities of a large return from sewage cultivation are great, and it cannot be doubted that they may sometimes be so developed, in continued practice, as to constitute a source of considerable income." But he does not give any balance-sheets. The superintendent of a lunatic asylum informs Mr. WARING (who planned the arrangements) that last year they raised a crop worth 170*l.* on a field of four acres, but the nature of the crop and its cost are not stated. It is quite possible that there may be places where profit is obtainable, but the best way to deal with the problem of sewage disposal is to seek for a process which will entail a minimum loss. Mr. WARING evidently prefers the utilising of sewage as a manure to any conversion of it into cement, bricks or other things which will confer a sort of permanent character on it, and English experience favours that view. He shows much respect for English investigations, but in this country the parts which describe the American inquiries are likely to receive most attention, and especially those which were undertaken for the Massachusetts State Board of Health.

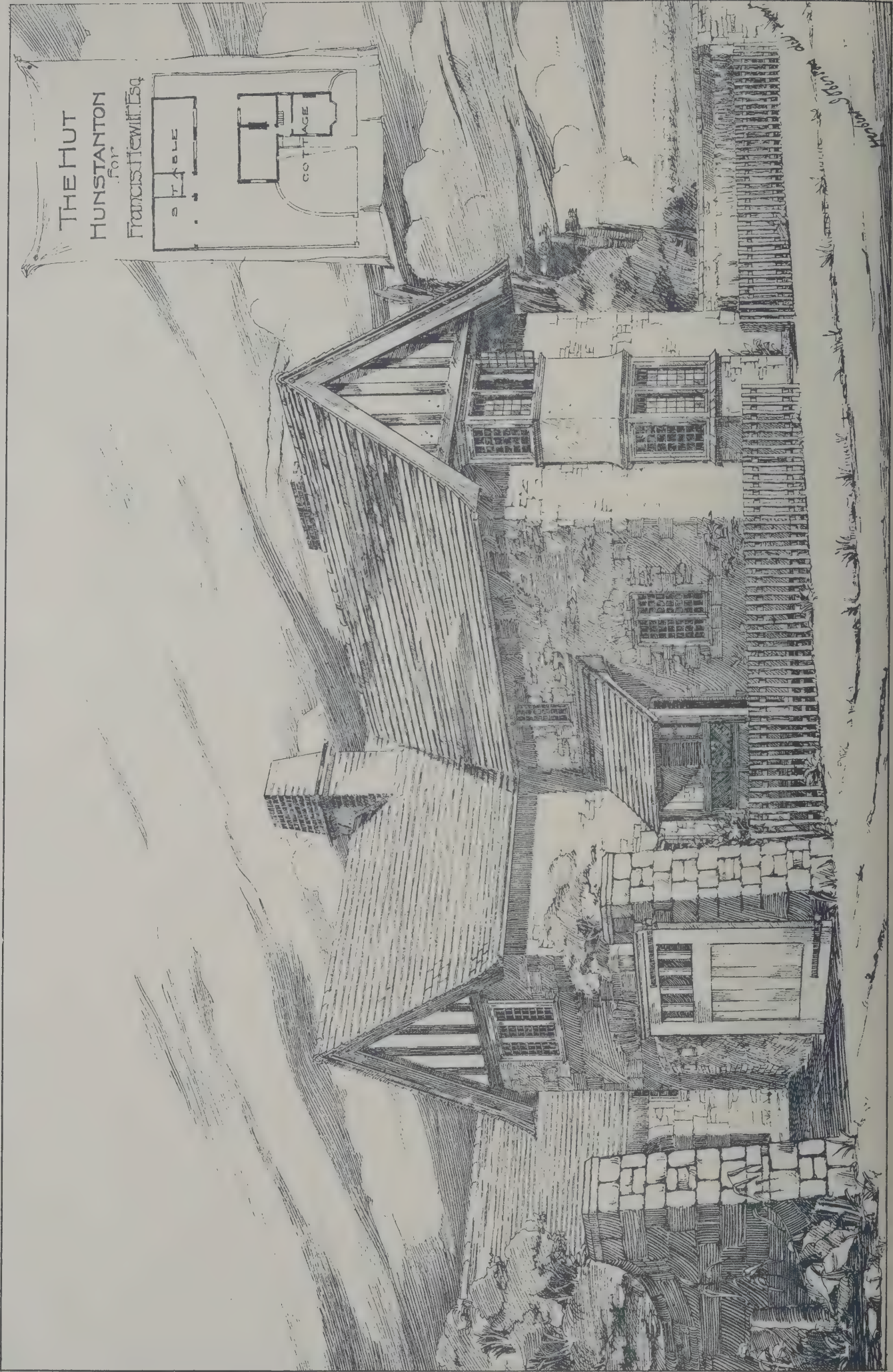
IN Belfast we expect to see shrewdness and economy exhibited in all transactions, and the new additions to the Art Gallery of the city exemplify those qualities. Some members of the committee lately visited the continent in order to purchase examples of various sorts to increase the collections. They wisely took care to obtain about seven hundred photographs of buildings ranging from the early days of Christianity to the end of the eighteenth century. Details as well as general views were obtained. The collection is likely to be permanently attractive, and it would be impossible to lay out a small sum of money on educational objects to more advantage.



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THE OLD GATEWAY AT SAN REMO.

Drawn by WILLIAM THOMSON.





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STATUES OF SOME WELSH SAINTS.

W. CLARKE, Sculptor.
G. E. HALLIDAY, Architect.



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INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

A TITLE PAGE.
By EDGAR H. TURNER.



GARDEN ENTRANCE.
By R. W. BEDINGFIELD.

ILLUSTRATIONS.

STATUES OF SOME WELSH SAINTS.

THE figures in our illustration represent the patron saints of several old Glamorganshire parish churches which have recently undergone reparation. The churches dedicated to St. CYNWYD, St. GEINOR, St. DAVID and St. NICHOLAS have been restored by Miss OLIVE TALBOT, of Margam Park, at a cost of about 15,000*l.* The figures are carved in Portland stone, and were executed by Mr. W. CLARKE, sculptor, of Llandaff. The various restorations were entrusted to Mr. G. E. HALLIDAY, architect, of Llandaff and Cardiff.

COTTAGE AND STABLE AT HUNSTANTON, NORFOLK.

THE local stone known as "Car," a stone of rich brown colour and coarse texture, has been laid in thin undressed blocks, the mortar being brushed out and kept well back from the surface. The roof is covered with quick weathering tiles, made by Messrs. BARDELL, of Lynn, and considerable projection is given to eaves and gables. This is an attempt to revert to the traditional method of building in the district, now almost entirely superseded, popular taste being apparently best pleased by cold-looking slate roofs innocent of eaves, and walls dressed as smooth as the nature of the stone will permit them to be. Mr. WILLIAM SOUTHGATE, late of Hunstanton, was the contractor, and Mr. HERBERT IBBERTSON, of 5 Adelaide Place, London Bridge, was the architect.

A TITLE PAGE.

THE drawing which has been reproduced in this illustration was exhibited this year at the Royal Academy. In style it recalls some Renaissance examples. The designer is Mr. E. H. TURNER.

OLD GATEWAY, SAN REMO.

THE illustration is taken from a drawing by Mr. W. THOMSON, which was in the exhibition of the Royal Academy.

GARDEN ENTRANCE.

THE original drawing was prepared by Mr. R. W. BEDINGFIELD, of Leicester, and was among those in the Architectural Room of the Royal Academy.

THE LIVERPOOL AUTUMN EXHIBITION.

THE twenty-fourth autumn exhibition of modern pictures held under the auspices of the Liverpool Corporation is now open in the Walker Art Gallery. There are 1,367 oil-paintings, water-colour drawings, etchings and pieces of sculpture, as against 1,242 last year, the increased accommodation being provided by hanging a little higher. The Royal Academicians represented include the President, G. F. Watts, F. Goodall, W. P. Frith, T. Sidney Cooper, L. Alma-Tadema, T. Brock, J. B. Burgess, Sir J. E. Millais, J. Macwhirter, Henry Moore, J. Pettie, C. Val Prinsep, W. W. Ouless, James Sant, Briton Riviere, W. F. Yeames, W. L. Wyllie, W. H. Thornycroft and H. T. Wells; while the A.R.A.s with pictures in the exhibition comprise A. C. Gow, F. Bramley, R. W. Macbeth, David Murray, G. H. Boughton, J. S. Sargent, J. W. Waterhouse, A. Stanhope Forbes, E. Onslow Ford, G. J. Frampton, A. Hacker and W. B. Richmond.

Mr. Wyke Bayliss, P.R.B.A., one of the hangers, has been interviewed by a representative of the *Liverpool Courier*, and gave the following replies:—"I don't quite know what to say about Liverpool art. I have been so busy choosing and hanging pictures that there has scarcely been time to inquire who has painted this or that. I know Mr. Fowler, and much admire his fertile imagination. I know, too, Mr. Follen Bishop, Mr. Talbot Kelly and Mr. Brockbank, for they are members of the R.B.A. Putting aside men of long standing, such as Carl Haag, Birket Foster, &c., I think that in the work of my three young friends you have the very choicest examples of the delicacy of atmospheric effect, with lovely composition and exquisite workmanship." Mr. Bayliss here selected Mr. Bishop's principal water-colour drawing, and illustrated at length its fine qualities, drawing attention to the subtle charms of composition, of sound landscape anatomy, and all the other factors which make a finished picture by a competent and conscientious artist a thing which to possess is an enduring joy.

By way of contrast he turned to a similar and apparently attractive composition by another well known artist, and laid bare faults which betrayed the painter's sad lack of knowledge or conscientiousness. Our representative suggested that this other artist's inferiority to Mr. Bishop was due to his not having the advantage of being a Liverpool man, but Mr. Bayliss waved such an idea aside.

"Look, too," he said, "at this drawing by my friend and fellow-labourer, Mr. Richard Hartley. I see" (looking round) "he is not within hearing, so I may say without hesitation that this is a work worthy of being placed among the best pictures of the land. Still, I can't pretend to a complete knowledge of Liverpool artists such as would enable me to pronounce a generalised opinion with confidence. Your painters seem to be particularly strong in aquarelle, and to carry their work very far. I don't find that there is any marked characteristic such as one recognises in Newlyn or Glasgow—you are less ambitious. Apart from Mr. Fowler you don't seem to produce much that is notable in the way of imagination. Such pictures as that, for example," added Mr. Bayliss, pointing to a large work which occupies the principal centre in the large water-colour room.

"I am afraid," said our representative, "that your illustration rather spoils your argument, for that picture is by a young Liverpool artist."

"I am glad to be so corrected," said Mr. Bayliss. "I consider it comes first among the works of imagination in water-colour, which is all the more praiseworthy as the water-colour section of the exhibition is remarkably strong. But, you see, you must not ask me to be dogmatic about Liverpool art. In fact, the question of locality does not greatly interest me. All true art is cosmopolitan, and what is interesting in an artist, as in a letter, is not the address, but the contents. I may say, however, I have noticed that you have some very capable portrait painters. There are two portraits of elderly ladies in the Grosvenor Room which I admire very much."

"You seem to approve of works of imagination, of so-called literary pictures, Mr. Bayliss. The dogmatists of the Artists' Club won't hear of such things. 'Put an idea into your picture,' say they, 'and it is ruined.'"

"That is all nonsense—why should we not bring literature into art? I say, bring everything into art. Art is a Kosmos, and should receive brain, passion, heart, judgment, knowledge, taste, courage, physical power, craftsmanship, poetry—everything of which heart and soul and body is made. Without, a picture is nothing—mere paint and canvas. Look at this picture of *The Finding of St. George*, by Mr. Gere, for instance." (We had passed into the oil-colour section.) "It is of very high quality, both in treatment and technique; but what distinguishes it chiefly is that it is highly poetical in conception. It is strongly reminiscent in style of Mr. Holman Hunt; in fact, it looks like a pre-Raphaelite work, done, not in the studio, but direct from nature."

"By the way," continued Mr. Bayliss, "while we are at this end of the galleries I want you to look at what I consider the strongest piece of craftsmanship in the exhibition. This picture, by Mr. Gordon, stands almost alone in splendour of technique. In what does the splendour consist? Why, because its workmanship is the farthest from fumbling, because of the magisterial adaptation of means to the end, because in it is the best brush-work—that is to say, the best possible touch put in the right place, with absolute knowledge."

"But let us go to what you call the Grosvenor Room. I want you to look at the splendid picture by our great Watts. It is one which can only be understood fully by those who know his great series illustrating the transition from chaos through evolution, giving the painter's idea of the record of Creation, as if it were another chapter of the Book of Genesis."

"Now, consider the picture as colour. It is a custom in heraldry for common people to have their coats of arms painted; nobles have theirs executed in metal; those of kings are made in jewels; of emperors by the constellations. Now, it seems to me that this old heraldic tradition applies to painting. Some artists paint with paint—you look at the picture and the pigment clamours for notice. Some, again, paint with precious materials. If, after you have looked at Mr. Watts's picture, one were to ask you, 'What blue is in the sky?' you would instinctively reply, 'Lapis lazuli.' It is not always so," added Mr. Bayliss with a significant glance aside, "sometimes it is Reckitt's."

"Leaving the jewel-like wonder of colour, let us consider the conception. A comparison will help us. Mrs. Normand's *Venus* is a goddess, not a woman. Mr. Draper's is a sea-nymph, not a woman. Yet both of them are more like woman than Mr. Watts's, which is yet entitled, *She shall be called Woman*. I take that to be the meaning of the abstract in art. Mrs. Normand's goddess would pass as a surpassingly beautiful woman if she appeared in muslin in a ball-room; Mr. Draper's creation might also if she were educated, but Mr. Hunt's is too typical to become an individual. It is a type, and not even a physical type."

"How charming," continued Mr. Bayliss, "Mrs. Normand's picture is, and how well it illustrates the difference between a man's idea of female beauty and a woman's. I admire greatly Mr. Draper's work which, though so strong, is still extremely subtle—subtle not only in form (it is splendidly drawn and modelled), but in colour and in tone. How subtle also the thought and design. For instance, the nymph is caught in a net, but you see she is not the only one who is caught—he, the lover, you see it in his face. Note again—all the strong men are stretching out their hands, some pointing, some working; his hands, too, are outstretched, but see how one of them is clasped back on his breast, where the wound lies. It is beautiful to note that, whether intentionally or not, Mr. Draper has lifted him out of the group of men by a perceptible difference in delicacy of complexion, marking his youth and creating physical sympathy between him and the maiden. The picture is infinitely richer and more valuable because of the literary suggestion it contains. As I said before, nothing good is amiss in art—put all in.

"Now let us look at these three landscapes by Mr. Terrick Williams, Mr. Julius Ollsen and Mr. Priestman. These three represent the forward movement in art in its best aspect. Their subjects are respectively sunlight, moonlight, mist. Alike they are free from eccentricity, but utterly daring, and in each case choosing some kind of beauty as its desire. They have no relation to that strange craze in art whose aim seems to be the apotheosis of ugliness. Beauty is the centre round which these creations have been evolved by hands possessed of full power of technique."

"What do you think of the exhibition as a whole, and do you consider that exhibitions of this kind are for the good of art?"

"I think it a very fine exhibition," said Mr. Bayliss, "very fine indeed; and I have been much struck by your permanent collection, which seems to have been formed on quite the right lines. You seem so often to have contrived to buy a painter's work just when he was at his best. No one who has been in the gallery could fail in talking of it to say, 'Have you seen Hunt's *Triumph of the Innocents*?' and it would be impossible to improve on the examples of, say, Mr. Yeames, Mr. Yeend King, Mr. Solomon Rossetti—to name the first few that occur—and your Segantini, certainly the finest thing of his seen in this country, shows his best characteristics in excess, especially his sense of the preciousness of material. He is one of the painters who do not paint paint, and so, too, is Mr. Hornel, who is certainly among the lapis lazuli painters. You understand what I mean? Yes, I certainly accept the Glasgow school—even Mr. Hornel—and I look for great things in that quarter.

"I won't say, beyond what I have already said, anything as to what I consider the best picture in the exhibition, and my function here precludes my indicating which I think the worst. The level of quality seems high, and the very bad among the rejected were certainly not over the average in number. Of course there are always a few terrors in every exhibition which serve as occasional refreshment to jaded hangers, but I would prefer not to describe them.

"You asked if such exhibitions do good," added Mr. Bayliss, looking at his watch. "Certainly they do. But dealers detest them, you say. Certainly, that is the best proof. They do good because they furnish to the public some guide as to what artists (who are the only competent judges) think of pictures. The hanging cannot be absolutely just; time would not allow of altering and altering again till the thing was perfect; but an exhibition such as this represents a severe, though rough, attempt to place the best pictures in the best places."

"You say," said our representative, "that artists are the only competent judges of pictures. We critics hold the reverse, namely, that artists are seldom capable of catholic judgment."

"We had better each abide by his own opinion," rejoined Mr. Bayliss; "only pray accept my apology for mine."

"Why is it good that the public should know what artists think of pictures? Because what the artists think to-day the amateur will think to-morrow, and the general public next day. It must be interesting to know what you are going to think."

"But pray, Mr. Bayliss, how does this fit in with the fact that the Royal Academicians, those high-priests who serve in the choir of your artistic cathedral, would have nothing to do with the pre-Raphaelites until the amateur had discovered them, until even the stupid public had begun to see there was something in the new idea?"

"Ah, that is a hard charge to answer," said Mr. Bayliss thoughtfully, looking as if some one had just called "check," "but I don't think that could happen now. Men were not so tolerant then. The art sin of this age, whatever it may be, is not narrowness. Indeed, the tendency now seems rather like the seeking after and being content with eccentricity, simply because it is eccentric. It is, I suppose, a revolt against feebleness, which, after all, is in any form the poorest, meanest thing of all in art."

ARCHITECTURE AND LITERATURE.*

WHILE every other art is living and progressive, architecture is by common consent stationary, if it be not actually retrograde. In every other art the artists have their eyes on the future. They do not doubt that the greatest achievements of their arts are before them and not behind—"That which they have done but earnest of the things that they shall do."

In architecture alone men look back upon the masterpieces of the past not as points of departure but as ultimate attainments, content, for their own part, if by recombining the elements and reproducing the forms of these monuments they can win from an esoteric circle of archæologists the praise of producing some reflex of their impressiveness. This process has gone so far that architects have expected and received praise for erecting for modern purposes literal copies of ancient buildings, or where the materials for exact reproduction were wanting, of ingenious restorations of those buildings. In architecture alone does an archæological study pass for a work of art. The literature of every modern nation is an express image of the mind and spirit of the nation. The architecture of every modern nation, like the dress of every modern nation, is coming more and more to lose its distinctiveness and to reflect the fashion of Paris. It was not always so. The architecture of Greece and Rome tells us as much as antique literature tells of Greek and Roman life. Mediæval architecture tells us so much more of Mediæval life than all other documents of that life that they become insignificant in the comparison, and that from their monuments alone the modern man can succeed in penetrating into the spirit of the Middle Ages. Nay, in our own time the architecture of every country outside the pale of European civilisation is a perfectly adequate and a perfectly accurate reflex of the life of that country.

I have spoken of the analogy between architecture and literature. It seems to me that it is not fantastic, and that if we follow it it may lead us to a comprehension of the very different state of the two arts to-day. Nobody pretends that modern literature is not an exact reflex of modern civilisation. If we find fault with the condition of it in any country we are not regarding it as a separate product which could be improved by the introduction of different methods. We are simply arraigning the civilisation of the country, thus completely expressed. If we find one literature pedantic, another frivolous and another dull, we without hesitation impute these defects as the results of national traits. The notion that any modern literature is not a complete expression of the national life no more occurs to us than the notion that any modern architecture is such an expression.

Now modern architecture, like modern literature, had its origin in the revival of learning. The Italian Renaissance in architecture was inextricably connected with that awakening of the human spirit which was the beginning of modern civilisation. It is not that Classic models have been discarded or neglected in the one art and retained in the other, for down to our own generation at least a liberal education, a literary education, has been a classical education. Whatever the baccalaureate degree is coming to mean now, for several centuries it has meant a knowledge of the masterpieces of Greek and Roman letters, as the education of an architect has during the same time implied a knowledge of the masterpieces of Greek and Roman building. A main difference has been that in literature the classical models have been used, and in architecture they have been copied. If writers had hesitated, even while Latin was the universal language in Europe, to use locutions "that would have made Quintilian stare and gasp," it seems to me quite certain that there could have been no literary progress, while it seems to be almost a tenet of the architectural schools, and at any rate it is a fair deduction from modern academic architecture, that no architectural progress is possible. There, alone in the work of mankind, the great works of the past are not alone useful for doctrine, for reproof, for correction, for instruction, are not even models in the sense in which we use the word in reference to other arts, but are "orders" to be carried out as literally as the conditions will allow, are fetiches to be ignorantly worshipped and invested with mysterious powers.

At the time of the revival of learning the purists were as strenuous in literature as they are even yet in architecture, and for a time as prevailing. The literary classics were to them what the architectural classics still are to the practitioners of official architecture, and the vocabulary of the ancients as sacred a repertory of words as the orders of the ancients a repertory of forms, to which nothing could be added without offence. To them it was not requisite that a writer should express his mind fully; it was not even necessary that he should have anything to say, but it was necessary that his

* From the Butterfield Lecture delivered at Union College, Schenectady, New York, by Mr. Montgomery Schuyler, and published in the *Architectural Record*.

Latinity should be unimpeachable. So long and so far as it was enforced, the restriction to the ancient vocabulary had as deadening an effect upon literature as the like restriction still has upon architecture. Lord Bacon has given an excellent account in a few sentences of the consequence of this "more exquisite travail in the languages original" upon the progress of literature and the advancement of learning. "Men began to hunt more after words than matter; more after the choiceness of the phrase and the round and clean composition of the sentence, and the sweet falling of the clauses . . . than after the weight of matter, worth of subject, soundness of argument, life of invention, or depth of judgment." The literary purists of the Renaissance were inevitably impatient of men who were preoccupied with what they had to say rather than with their way of saying it, and were especially incensed against the school philosophers "whose writings," to quote Bacon again, "were altogether in a different style and form, taking liberty to coin and frame new terms of art to express their own sense, and to avoid circuit of speech, without regard to the pureness, pleasantness, and, as I may call it, lawfulness of the phrase or word." Substitute "form" for "phrase or word," and you have here an exact statement of the respective positions of the progressive architect, and of the architectural purist, and of the reason why it is out of the question that architecture should advance when the teaching and the practice and the judgment of it are confided to the architectural purists.

In literature the restriction did not last long. If it could have lasted it would have arrested the literature and the civilisation of Europe, for a demand that nothing should be expressed in new words was in effect a demand that nothing new should be expressed. Such a restriction, when the human spirit had once been aroused, it could not accept. The instinct of self-preservation forbade its acceptance. Men who had something to say insisted upon saying it, saying it at first in barbarous Latin, to the pain of the purists who had nothing to say and did not see why anybody else should have anything to say that could not be expressed in the classical vocabulary; saying it afterwards in "the noble vulgar speech" which at first, and until it had been developed and chastened and refined by literary use, seemed cruder and more barbarous still. The progress of mankind being at stake, the purists in literature were overwhelmed. Only the progress of architecture being at stake in the other case, the purists have prevailed and architecture has been sacrificed with only local and sporadic revolts, and these for the most part within our own century, in place of the literary revolution that was triumphantly accomplished four centuries ago.

It was not accomplished without a struggle. The "more exquisite travail in the languages original," when there was no other but classical literature, had induced in scholars the belief that the masterpieces of that literature would never be equalled. It is, I believe, still questioned by scholars whether the Classic masterpieces have been equalled even yet, while it is the opinion of scholars that the languages in which they were composed are still the most perfect orders of speech that have existed. It was natural, then, that men who had nothing in particular to say, or at any rate felt no urgent need of expressing themselves, should have deemed that Classic literature was complete as well as impeccable, and that its limitations could not be transcended. Fortunately for us all, there were other men who felt, with Browning, that—

It were better youth
Should strive, through acts uncouth,
Toward making, than repose on aught found made,

and these men were the greatest scholars as well as the greatest thinkers of the age. Politian, of whom it has been said by a critic of our own time that he "showed how the taste and learning of the classical scholar could be grafted on the stock of the vernacular," ridiculed the purists in better Latin than their own. "Unless the book is at hand from which they copy," he said, "they cannot put three words together. I entreat you not to be fettered by that superstition. As nobody can run who is intent upon putting his feet in the footsteps of another, so nobody can write well who does not dare to depart from what is already written." And while the Italian scholar was deriding the Italian pedants, the Dutch scholar, who did not even look forward to a time when the vernacular should supplant Latin, yet protested against the imposition of Classic forms as shackles upon modern thought. "Hereafter," said Erasmus, "we must not call bishops reverend fathers, nor date our letters from the birth of Christ, because Cicero never did so. What could be more senseless, when the whole age is new, religion, government, culture, manners, than not to dare to speak otherwise than Cicero spoke. If Cicero himself should come to life, he would laugh at this race of Ciceronians."

It would be as presumptuous in me as it is far from my intention to disparage academic training, in architecture or in literature. The men who have done most towards building up these great literatures, that are at once the records and the

trophies of modern civilisation, have for the most part been classical scholars, and classical scholarship stood them in particularly good stead when they worked in the vernacular, especially during the formative periods of these literatures, when there were as yet no standards or models but those of antiquity. Perhaps what seems to us the most autochthonous of our literature owed more to this culture than we are apt to suppose. "I always said," Dr. Johnson observes, "that Shakespeare had enough Latin to grammaticise his English." These writers derived from their classical studies a literary tact that could have been imparted so well in no other way. Certainly the same thing is true of the classically trained architects. Whether they are working in the official style that has been the language of their schools, or have attempted the idiomatic and vernacular treatment of more extended and varied methods of construction than the very simple construction of Greece, which was expressed with consummate art, and the more ambitious and complicated construction of the Romans, which yet is simple compared with our modern constructions, and which cannot be said to have attained its artistic expression; in either case there is equally in their work this tact, this measure and propriety that bespeak professional training. It is not the training that I am deprecating, but the resting in the training as not a preparation but an attainment. There is another pregnant saying of Bacon that would well recur to us when we see the attempt to meet modern requirements without departing from antique forms, and to carry out academic exercises in Classic architecture into actual buildings:—"Studies teach not their own use, but that is a wisdom without them and above them, won by observation." It is as if an educated man in our day should confine his literary efforts to Latin composition. Very curious and admirable essays have been made even in modern Latin and even in our own time. To see how near one can come to expressing modern ideas in classical language is an interesting and useful exercise, by the very force of the extreme difficulty of even suggesting them and the impossibility of really expressing them. When the modern Latinist has finished this circuitous and approximative progress he has produced what—a poem? No, but only an ingenious toy for the amusement of scholars—a "Classic design." If he devoted his whole literary life to the production of such things we should be entitled to pronounce decisively that he had nothing to say, or he would take the most direct way of saying it. It would be evident that he was preoccupied with the expression and not with the thing to be expressed, not with the idea but "with the pureness, pleasantness and, as I may call it, lawfulness of the phrase or word."

A living and progressive Classic poetry in our day we all perceive to be merely a contradiction in terms. Classicism is the exclusion of life and progress, and a living and progressive Classic architecture is, in fact, equally a contradiction in terms. Forms are the language of the art of building, and architectural forms are the results and the expression of construction. This is true of the architecture of the world before the Renaissance, excepting the Roman imitations of Greek architecture. It is true even now of the architecture of all that part of the world which lies outside the pale of European civilisation. It is only since the Renaissance and in Europe and America that Classic forms have been used as an envelope of constructions not Classic, and that the attempt to develop building into architecture has been abandoned in favour of the attempt to cover and conceal building with architecture. This attempt is beset with difficulties by reason of the modern requirements that cannot be concealed. I have heard of a Classic architect saying that it was impossible to do good work nowadays on account of the windows. This is an extreme instance, doubtless, but the practitioner of Classic architecture must often be as much annoyed by the intrusion of his building into his design, and the impossibility of ignoring or of keeping it out altogether, as the modern Latin poet by the number of things of which the Classic authors never heard that he has to find words for out of the Classic authors. The versifier does not venture to complain in public, because everybody would laugh at him and ask him why he did not write English. But the Classic architect is not afraid to make his moan, and to complain of the intractability of modern architectural problems, or to excuse himself from attempting a solution of them upon the ground that they do not fit the Classic forms. He is not likely to find sympathy in his complaint of the oppressiveness of shackles which, in this country at least, he has voluntarily assumed. Why should we not laugh at him also? He, too, may be recommended to write English, which in his case means to give the most direct expression possible to his construction in his forms, and to use his training to make this expression forcible, "elegant" and scholarly; poetical if the gods have made him poetical; at any rate, "to grammaticise his English" instead of confining himself to an expression that is avowedly indirect, circuitous, conventional and Classic—a polite "language" like the Latin of modern versifiers. "Si revivisceret ipse Cicero, rideret hoc Ciceronianorum genus."

The repertory of the architectural forms of the past is the vocabulary of the architect. But there is this difference between his vocabulary and that of the poet, that a word is a conventional symbol, while a true architectural form is the direct expression of a mechanical fact. Any structural arrangement is susceptible, we must believe, of an artistic and effective expression. Historical architecture contains precedents, to be acquainted with which is a part of professional education, for many if not for most of the constructions commonly used in modern building. But Classic architecture does not contain them. The Greek construction is the simplest possible. The more complicated Roman construction was not artistically developed and expressed by the Romans themselves, and the literary revivalists of Classic architecture of the fifteenth century restricted themselves and their successors to the Roman expression without very clearly understanding what it was. They were more royalist than the king, more Ciceronian than Cicero. If we are to accept the statement of Viollet-le-Duc, Vitruvius himself, if he had submitted his own design, as he describes it, for the basilica of Fano, in a competition of the Ecole des Beaux-Arts at the beginning of this century, would have been ruled out of the competition for his ignorance of Roman architecture. But, in any case, the classical building embraces but a small part of the range of constructions that are available to the modern builder. To confine one's self to Classic forms means, therefore, to ignore and reject, or else to cloak and dissemble, the constructions of which the Classic builders were ignorant, or which they left undeveloped, to be developed by the barbarians.

And here comes in another restricting tenet of the schools, that you must not confuse historical styles. No matter how complete an expression of an applicable construction may have been attained, if it does not come within the limits of the historic style that you have proposed to yourself, it is inadmissible. This is not a tenet of the official schools exclusively. It is imposed wherever architecture is practised archaeologically. In the early days of the Gothic revival in England, Gothic building was divided and classified more or less arbitrarily, and it would fatally have discredited an architect to mix Early English and Middle Pointed, or to introduce any detail for which he had not historical precedent, and this without regard to the artistic success of his work, but only to its historical accuracy. It was not until the architects of the revival outgrew this superstition that their work had much other than an archaeological interest. Any arbitrary restriction upon the freedom of the artist is a hindrance to the life and progress of his art. While it is no doubt more difficult to attain unity by the use of constructions that have been employed and expressed in different ages and countries than by renouncing all but such as have been employed together before, and have been analysed and classified in the schools, the artist is entitled to be judged by the success of his attempts and not to be prevented from making them.

THE PLANNING OF HOSPITALS.*

ONE cannot speak properly of the planning of hospitals without including much that does not strictly belong to the province of the student of architecture. You will pardon me, therefore, if I open these remarks with statements and explanations bearing upon the subject which are derived from such medical authorities in hospital science as are well known to fame in this connection.

What follows is not said to undervalue the work which has been done by the medical specialists, but to awaken thought in a new direction for the benefit of our own profession, to whom the business of designing all kinds of buildings legitimately belongs.

One of the objects of this lecture is to suggest to the young minds before me the possibility of an improvement in hospital building, which would spring up if the architect should so fit himself by early and careful training for the special work of designing and constructing hospitals. Granted that a hospital is a machine, if you will, it seems reasonable that it may be and ought to be an agreeable looking machine, and there is nothing in nature or art to prevent the architect from understanding and producing it.

Whether working with a specialist, or as a specialist, it becomes the architect, who must remain the authorised interpreter to the workmen of all drawings and specifications, to know the value of and the reason for every line and every word that they contain. Furthermore, he is often called upon to be accountable, and sometimes the accounting head, in carrying on the works. Over and above all these points, he has the artist's responsibility in the case, to give the building or group of buildings whatever of artistic character may be possible, or

under the most unfavourable circumstances to see that the result shall not develop as a blot or an eyesore.

The history of hospitals up to recent times is rather mythical; Egypt, India, Greece and Rome are all said to have had something of the kind. While the subject is one of great interest, there is too much of uncertainty and mere conjecture surrounding it to yield much profit to the general student.

Hospital.

The English word "hospital" has been and still is used in a double sense, viz. "As a place of medical treatment, and also as a retreat for the poor, the infirm, &c."—"Encyclopædia Britannica." Burdett in his great book uses two terms; the title is "Hospitals and Asylums of the World."

The late Dr. Kirkbride deviated from the English nomenclature with regard to establishments for the care of the insane; these in England are usually called "asylums." Following Dr. Kirkbride, the term "Hospital for the Insane" is generally used in this country to indicate that the institution is for the purpose of treatment of insanity as a disease with a view to its cure, and not as a mere shelter for its inmates.

What I have now in mind to speak of more particularly is the hospital for the treatment of the sick and wounded.

Originally the word hospital meant, as the word asylum now means, a place of shelter for the poor and helpless only; now it has the included meaning of treatment and restoration. The inmate of an asylum may or may not be a patient, the inmate of a hospital proper is always a patient, and the rich as well as the poor avail themselves of the benefits of hospital treatment. There is good reason to believe that in many cases, especially those of a surgical character, a well-organised hospital possesses great advantages over the best equipped private house. All difficult and dangerous operations can be there performed under conditions more favourable than at home. So that the hospital manager, the doctor and the architect must work together to improve this life-saving and life-lengthening apparatus, and the best equipped man for the work ought to be the architect.

Hôtel Dieu.

It is only within comparatively recent years that scientific progress has been made in the organisation of hospital management and the construction of hospital buildings. France appears to have taken the lead, but England and America are now well abreast, if not ahead. The old Hôtel Dieu at times during the last century held five thousand patients. As many as six people were laid in one bed. The buildings occupied only a little over three English acres, so that each inmate of this "house of God" was allotted only about thirty square feet of the earth's surface whereon to live and breathe. You will better appreciate the extent of this crowding when told that each inhabitant of the city of Paris has 430 square feet, and of the city of London about double this area, or over 800 square feet. There is some satisfaction in knowing that the present Hôtel Dieu gives each patient 311 square feet, although this is a very short allowance according to the present advanced idea of the proper ratio.

The earliest record of hospital building in England states that in the eleventh century two were founded by the Archbishop of Canterbury, Lanfranc by name.

About fifty important hospitals were founded in England, Ireland and Scotland during the eighteenth century, which shows a wonderful movement in the intentions of benevolence. The earliest hospital in North America is the Hôtel du Précieux Sang, built in 1638, and the next in order of time the Pennsylvania Hospital in Philadelphia, the east wing of which was built in 1755.

Before the Revolution of 1789 the French had begun to devise special plans, but that terrible event intervened, and no tangible improvement grew out of their thought and invention until the La Riboissière was begun in the reign of Louis Philippe. Singularly enough, the Revolution of 1848 interfered with the building of that, and it was not completed until the year 1854.

The Episcopal Hospital.

When the Episcopal Hospital in Philadelphia was designed in 1859, the La Riboissière was considered by its projectors as the best existing model to be followed. I may say it was not strictly followed, but in all essential features it is probably the best hospital building which was erected at or before that period. Its benefits came into full play in our Civil War.

The Johns Hopkins.

The plans of Johns Hopkins Hospital in Baltimore, recently published by Dr. Billings, illustrate more fully than any other yet built the thorough study of the subject which is being given in modern times. It is in effect, from the medical point of view, an ideal hospital. No thought, time, trouble or expense was spared to make it so; to carry into practice the most advanced ideas of hospital design and construction. I shall refer to this frequently as it is a convenient landmark and object lesson. There can be no objection to doing so, as the plans

* A lecture delivered before the Architectural Department of the University of Pennsylvania, by Mr. Addison Hutton, architect.

by their publication have become common property. If a copy of Dr. Billings's book is not already in your library, it ought to be placed there.

In the Johns Hopkins Hospital, beyond the administration and pay wards, it is difficult to discover the touch of the artist. Architecture as an art seems to have been subordinated to the demands of hospital science, and any thought of architectural beauty in the treatment of the external appearance of the common wards, particularly ignored. I wish to suggest the point that there are no compelling requisites of size, proportion or detail in hospital plans that may not be softened and rounded by artistic care, so as to give token of regard for beauty.

Passing by the collateral needs, all of which enter into the planning of hospitals, such as the departments for administration, for clinical teaching, for training of nurses, for out-patient service, for isolating purposes, for the pathological work, for cooking and washing, our present business will be with the arrangement and construction of a proper hospital ward, with its inseparable adjuncts.

Terms.

A room furnished with a bed or beds to receive patients is called a ward. For many reasons it has been found satisfactory within economic limits to place from ten to thirty patients in one room, and this room is called the main ward, and if the hospital contains more than one, they are numbered 1, 2, 3, &c. They are also spoken of by the attending physicians and nurses as medical wards, surgical ward, &c., according to the use. But it is not necessary to make this distinction in connection with planning. The needs of a surgical ward are the most exacting; if we plan properly for that we shall cover the ground for all requirements, except for cases where special isolation is required. In the Massachusetts General the Bradlee Ward is designed on isolating principles, a special ward for abdominal and cerebral cases.

But I wish to confine your attention just now to that unit of a hospital which is, or should be in emergency, a complete hospital in itself and is called, for convenience, a pavilion. This consists of two parts, the main ward and the head-house, as well separated from each other as the nature of their relations will permit. Under certain regulations it is now conceded that another ward and head-house may be superimposed, making a two-storey pavilion. There has been much discussion as to the advantages and disadvantages of two-storey building pavilions. There was a period when the authorities told us that the one-storey only could be the proper thing. The Johns Hopkins built some of each, and, it may be supposed, is now making a record of comparative results.

Area.

We will consider now the main ward. Its floor area should have a minimum of 100 square feet per bed, and it is believed that no ward ought to have over thirty beds. If we fix the clear height at 12 feet, which is probably the minimum that should be allowed, we have 1,200 cubic feet per patient. That is a fair standard of practice in the climate of Philadelphia, provided reasonable attention is given to the means of winter ventilation. The glass surface for the windows should not vary much from 20 square feet per patient, although this may be considerably decreased in more northern latitudes and on stormy exposures.

Form.

The usual form of the ward is an oblong parallelogram of about 25 feet in width; this is enough when 8 feet length per bed is allowed. Some have been made of greater width; the Johns Hopkins wards are 28 feet wide, with 7 feet wall length per bed. The wards in the Episcopal Hospital are, I believe, fully 30 feet wide in the clear, but this width in a long ward is now considered excessive.

Some of the modern English hospitals have very pretty circular wards with ventilating stacks in the middle, and it is a matter of some surprise that octagonal wards, such as one built in the Johns Hopkins, have not been more usually adopted. In the Massachusetts General, built in or about 1820, the wards are nearly equal sided, with a great chimney-stack in the middle. A modification of this, except that the sides are extended and the corners are cut away to form an irregular octagon, may be seen in the new wards of the Pennsylvania Hospital.

These wider wards with the central chimney, whether square, round or octagonal, present some marked advantages in the matter of ventilation, and are especially desirable when there is a superimposed ward. Later on I hope to recur to this.

Site and Orientation.

In choosing a hospital site, the quality of the soil, the facility of water-supply and drainage should be carefully attended to. But an important care and duty of the architect is to regulate the orientation of the wards. These invariably ought to be placed on the south side of the connecting corridor, and, when oblong, should have the axis as nearly on the meridian as possible.

Thus every day of the year in which the sun shines, at least three walls of a rectangular ward will be bathed in sunshine. This is good for the patients, good for the building, good for warmth and good for ventilation.

Spacing of Wards.

With the orientation just described, the interval between wards may be smaller than in any other. Thus, if a one-storey ward be 14 feet from the first floor to the eaves, the space between wards may be 28 feet; if there is a superimposed ward, this interval should be much greater.

Head-House.

As the ward is the essential part of the hospital, it has claimed our attention thus far. But food, clothing, water and drainage are important and must be available in a hospital as elsewhere. A section of the pavilion is isolated as nearly as possible from the ward by the cross-corridor, through which, as often and as long as possible, fresh outside air is allowed to pass. On the north side of the corridor, supposing the orientation to be regular, is placed the head-house containing the numerous adjuncts which go to make each pavilion a complete hospital in itself.

Here are placed the stairs, the service-room through which is served all food (which comes, in a large hospital, from a remote kitchen, by way of the basement corridor), the clothing-room, the linen-room, the nurses' duty-room, the bath-room, the water-closets, and if practicable, one or more special rooms or wards for single beds.

Ventilation.

All the water fixtures are arranged for special artificial ventilation separate from the ward ventilation. Keep fairly in mind that the governing thought, difficult to put into execution in our climate, is primarily to isolate the ward by means of air currents from the head-house and each pavilion from its neighbours as much as possible, and that inside of the head-house (or outside of it, as you may sometimes find it necessary) the drainage fixtures must be further isolated by a well-formed air-passage flushed as frequently and as much as possible with fresh external air. Another help in natural ventilation is the peculiar window which has a transom at 2 feet from the top, the sash of which is hinged at bottom to open inward to admit fresh air at the top, which is thus admitted and impelled in mild weather into the room toward the ceiling without danger of too much draught on the patient.

You may find under some conditions that it will be necessary to control the ventilation, especially in winter, by fan pressure, but this should not happen in a new enterprise where the conditions of the selection of site and orientation can be controlled or regulated. But you will be called sometimes to enlarge, alter or extend existing hospitals, and you will then be glad to draw on all resources within your reach.

Aspirating Flue.

It will generally be found best to construct a large single ventilating flue for each ward, with openings into it at floor and ceiling. This is rendered active by a coil of pipe heated with steam all the year round. Such a flue cannot be placed within the lines of the long narrow ward, but may be placed in the head-house or lobby, as in the Johns Hopkins. It involves long ducts both under and over the ward, and places a serious difficulty in the way of a second-storey ward. Owing to the great length of the horizontal ducts and branches it would seem that the effective draught would differ much between the near and distant parts of the ward.

In the wider ward having a central stack such as the octagonal wards of the Johns Hopkins, the square wards of the Massachusetts General and the wide Memorial wards of the Pennsylvania, the central ventilating-stack will undoubtedly perform more thorough work in a more economical manner. The steam-pipes and coils are made accessible by means of a ladder from the basement to the attic.

A separate flue of the same description, in which steam, water and drain pipes are placed, ventilates the water-closets; the other parts of the head-house are ventilated by flues, collected into a separate common head, having steam coils like the rest.

Warming.

Volumes have been written on warming in connection with the subject of ventilation. Merchants, manufacturers, doctors, lawyers and engineers from time to time have burdened the world with new books. It is nearly safe to say that nobody in a northern climate has ever been thoroughly and continuously satisfied with his warming apparatus. So I will not startle you by saying that such a hospital or such a house has a thoroughly satisfactory apparatus. What is to be brought forth hereafter in electrical invention no one can safely predict; nothing yet has appeared to supersede the appliances through which steam for fifty or sixty years past has been found clumsily effective.

At the Johns Hopkins both steam and hot-water appliances are put in. This has been to solve experimentally the question

as to which is better. In the other hospitals within my knowledge steam alone is applied.

Almost invariably cast-iron radiators, which now largely take the place of the pipe coils, are placed in the basement at the bottom of the hot-air flues. Fresh air brought from the outside at least 6 feet from the ground passes over these radiators, and becoming warmed is discharged through metal-lined flues into the ward or wards above. The area of these flues is reckoned for this latitude at about 100 square inches per patient, and the area for ventilation by the means already referred to should not be materially different. An important feature in any method of warming is the management of the admitted air. Whether the winter weather be cold or mild, the inflow of air to the ward should be kept as nearly as possible to the same volume.

This is done by a mixing damper, so placed that by a single movement the flow of hot air is diminished, the flow of cold air increased; the two volumes thus thrown together, mixed and tempered, are delivered into the ward. By means of an actuating chain or rod this movement of the damper is performed by the nurse without leaving the ward.

With this tempering arrangement for inflow and proper openings for outflow at floor and ceiling—those at floor are always open, those at ceiling controlled by registers so that the air may be changed and the temperature promptly lowered on occasion—extraordinary care is not required to keep the ward at the proper temperature.

I ought to mention that the inlets for warm air are better placed under the windows; the windows are the coldest points in the room, and as the greatest space between beds is opposite the windows, the danger of draughts on the beds is thus minimised.

Construction.

In speaking of the construction of the hospital I will refer only to such features as are especially important in this class of building. Of course hospital construction in most particulars may be, and usually is, the same as in other buildings of the better class.

The foundations should be laid with stone and cement, and there should be a damp-proof course of asphaltum or slate at the ground-line. In some soils the foundations should be drained with tiles; in those of sand or gravel this is not necessary.

So far as is ascertained there is no better material for walls than brick. All interior partition walls ought to be brick. The weather-barriers should be formed of two 9-inch walls with 2-inch air-space, well bonded at all jambs and corners. An excellent alternative is an 18-inch solid wall with hollow lining of terra-cotta, whereon the wall plaster is laid. Either of these devices will insure dryness of the internal wall surface.

A principle to be followed as carefully as possible in hospital building is to leave as few cavities in the construction as consistent with the conditions of integrity and endurance.

Every surface should be solid and smooth as practicable, and thus easily and freely cleansed and kept clean.

When floors are constructed in the usual manner the intervals between joists may be filled with mineral wool. This helps to deaden sound, leaves no harbour for rodents or any other offensive thing. Still better, where the appropriation of funds will permit it the floor should have beams of iron or steel filled in with bricks; the nailings of the surface floor will thus rest on a bed of iron and burnt clay. Again the mineral wool comes into play between the railings or sleepers. The surface floors must be hard wood; nothing is better than the southern yellow or pitch-pine, which, when cut and dressed to show the edge grain, makes a handsome and most serviceable floor. A good, tight, smooth, well-finished floor is most important; paraffin and soluble glass are recommended as coatings. The joining to the wall is best with a neat wooden core, the usual high wooden bare skirting being omitted. In fact, only such inside woodwork as is absolutely necessary is recommended in the best hospital construction. The window jambs and heads may be rounded or chamfered in plaster, and the window sills rubbed slate.

The floor and parts of the walls of the water-rooms are lined with pottery tiles, and all angles give place to curves, concave or convex.

It is best that stairs shall have iron construction, and if slate-treads come within the appropriation they are to be preferred to wood.

The plastering of the walls and ceilings should have great care bestowed upon it. The surface should be left with what is known as hard-finish, composed of lime, sand and much labour. Where lath are commonly needed, such as on ceilings, &c., stiffened wire netting should be substituted.

At all internal points, and in all materials, whether stone, brick, wood, pottery, plaster or metal, constant attention should be given to the avoidance of open joints, sharp corners, quirks and creases. The exclusion from the interior of the ward of all architectural decoration may be a part of the reason why in

recent times there has been a disposition to exclude the architect himself.

If I have seemed to take up much time in dwelling on what might be called the peculiarities of hospital building, I assure you I have done so with the general purpose of outlining the subject, as it were, by simply touching on some of the details in a way that may attract your attention, with the thought that some of you might in the future take up the designing of hospitals as a specialty. Be assured that the subject is a large one; thousands of volumes have been written upon it; new discoveries in medical and surgical science are modifying the older theories, so that one needs to keep abreast with daily progress. For those who have a certain combination of mechanical with artistic genius, it would certainly prove exceedingly interesting and possibly profitable in fame and money.

The increase of material wealth of the people of this country, the inevitable poverty and suffering which travel on foot alongside of the chariot of wealth, are the two factors which will more and more conduce to the founding of institutions for the charitable care of the sick and suffering. Then as science prospers and proves what it is capable of in healing and minimising pain, the rich and well-to-do will patronise such establishments in which they can be better relieved and cured than in their own homes, and will add liberally to the means of supporting them.

I am the more moved to speak as I do, because some of the medical advisers have strongly intimated their disregard for architectural beauty, as if it were not worth an effort. I plead that the skill of the architect can modify the appearance of almost anything having walls, windows and roof, so as to render it a thing inoffensive, and, with perhaps a slight addition to the expense, a thing of beauty.

M. Tollet, a French writer on hospitals, thinks that the ogival or Gothic form of architecture was adopted in the Middle Ages as much for sanitary as for architectural reasons. Whether he be correct or not (it appears to be a conjecture only), this writer sees no objection to its use, except that it does not seem to lend itself so readily to the rigid conditions imposed by modern sanitary science.

But there is one point worth noting in regard to this. Doctors, for a wonder, do not differ in their recommendations for top ventilation; in one-storey wards this easily becomes what is termed ridge ventilation. In all wards it is very desirable to slope the ceiling upwards from the sides to the middle. So that we have in the ceiling of any ward, especially of the one-storey ward, a hint of Gothic which might well be followed in the external architecture of the building.

If one were requested to design a hospital group in the Gothic style, he should not seriously resist the pressure to do so. It is possible to do it without trespassing on the code of hospital science so far as I know it. One should be allowed and should take much freedom in such an instance; he would be glad, of course, if the state of the treasury would admit of stone as a material for external walls.

But if you ask what type of architecture appears best suited or most adaptable to beautifying the hospital, I am obliged to answer, a modified Renaissance or some derivative of Classic; that is, so far as detail is concerned. There can scarcely be such a thing as perfectly regular or symmetrical handling of the voids and solids, as is necessary to give the best developed results in Renaissance.

You are obliged to submit to certain irregularities of plans and arrangement of openings, because the wants of the interior are dominant, and interfere with the symmetry required in the perfection of the Renaissance.

The combination in the same view of the wards, which are large, with the rooms of the head-house, which are small in plan, but for working reasons must be high in storey, adds to the difficulty of designing a building to show the regular and symmetrical beauties of Renaissance work.

The solution of the question as to what is best can, perhaps, be nearly reached by recognising the difficulty fairly, and approaching it in the most direct way.

In a hospital group there are some parts, notably the administration building and the pay wards, the requirements of which do not suffer by compromise with the demands of external symmetry. These and certain portions of the wards and head-houses may have regularity of design. (It seems unfortunate that the most satisfactory storey heights for sick wards are not sufficient to permit mezzanines in the head-houses.) For the rest, you perforate the walls at such points as you must, and rely on horizontal courses and minor details of the cornices and windows for such effects as will make harmony with the richer parts of the design.

It does not seem good judgment to leave the walls of the wards and head-houses so bare and devoid of architectural interest as those of the Johns Hopkins are, especially as they front and are seen from a beautiful park, and every ward is visible from its neighbour. It seems to me that the patients and nurses should have something more interesting to look at

than naked walls, which might be, for any external sign that they give, those of a warehouse, and chimneys which might be those of a chemical laboratory.

But I must close. I feel that I have only hinted at the thoughts and things which enter into this very interesting sort of building. But if I have awakened in some of you the desire to know more of the subject, I have accomplished all that could be expected within the allotted hour.

I will name three books (I might name ten or twenty; but naming the three, you will have a guide to all the others) in which you can find the book knowledge upon which you can start the structure of your equipment for hospital work:—Burdett's "Hospitals and Asylums of the World," "Encyclopædia Britannica," "The Johns Hopkins Hospital."

The Middle Ages were the cathedral building centuries. The nineteenth century is the era of railroads and high buildings. The twentieth century, with the growing tendency of the strong to help the weak and unfortunate, coupled with the ability to help them, may prove to be the age of scientific healing, and more universal, enlightened, benevolent and charitable work than has ever before been seen in the world. Along with this will undoubtedly grow the love of all beautiful things in nature and art.

I can think of no nobler work for you to engage in, those of you who may feel drawn in this direction, than that of preparing to take a part in bringing about this great consummation. If any of you do, I trust it will be with high aims, and with the feeling that this is something better than a railroad building, shall I say better than the Crusades or cathedral building, or any other demonstration of enthusiastic building that ever took place for the good of man or the glory of God?

Every work that is done, in the spirit that is now abroad, for the amelioration and relief of human pain, is a step towards the millennium. The hospital, which was once a pest-house, and, in a measure, a curse, although founded on the best instinct of humanity, will in the course of the future become without doubt an unmitigated blessing, a veritable Hôtel Dieu, a "house or hostelry of God."

THE BAPTISTERY.

THE word "baptistry" is derived from the Greek word for a large vase, labrum or piscina of the frigidarium. When it was decided to erect baptisteries in which the rite of baptism could be performed on many converts, a site near a church was selected. The form adopted was generally hexagonal, and it is very probable that the form of these buildings was imitated from some apartment in a Roman bath.

The most celebrated existing baptisteries are those of Rome, Florence and Pisa; the most ancient is the baptistry of St. Giovanni in Fonte, near the church of St. Giovanni Laterano, at Rome, commonly said to have been erected by Constantine the Great. The plan of this building is an octagon, with a small portico at the entrance; the interior is decorated with eight most beautiful porphyry columns, the finest of the kind in Rome. These columns, unequal in diameter, support an architrave, over which eight small white marble columns are placed; above this second order there is an attic decorated with pilasters, and this is crowned with a dome. The walls are adorned with frescoes, consisting of subjects from the Gospel and the principal events of the reign of Constantine. In the centre of the building there is an octangular basin, 3 feet deep, lined and paved with marble. A modern font now stands in the centre of this basin, raised on steps of marble. The diameter of this structure is about 75 feet (according to the measurement of Noli), and it appears to have been constructed with the materials of other buildings. Eustace calls this structure a chapel, and informs us that in it "only, and upon the eves of Easter and Pentecost, was public baptism administered in Rome; many magnificent ceremonies, which occupied the whole night, accompanied this solemnity."

The Baptistry of Florence, which is also octangular, with a diameter of about 100 feet, stands opposite to the principal entrance of the cathedral. The date of its first construction is unknown; the Florentines pretend that it was originally a temple to Mars. In the internal arrangement sixteen large granite columns are employed to support a gallery, which is carried nearly all round the interior; the vaulting is decorated with mosaics by Andrea Tafi, the scholar of Cimabue; on the pavement is a large circle of copper, with numerical figures and signs of the zodiac upon it; and in the centre of this stood originally a very fine octagonal basin. The external façades are built of black and white marble, and designed in that peculiar style of Florentine architecture of which Giotto was the father. Possibly this edifice may have been erected after his designs. The three great bronze doors are celebrated for the beauty of their bas-reliefs, and for the marble and bronze figures above them. The valves of the doors are divided into panels, on which are represented the principal events of the

life of St. John, "the cardinal and theological virtues," and subjects from the Old and New Testament; and so important was the subject considered, that learned men were engaged to select subjects for the sculptor. These individuals were Nicolo da Uzzano and Leonardo d'Arezzo. One of these doors was executed as early as 1330, and in after times eulogised by Michel Angelo in the highest style of panegyric. The most celebrated of these doors was made by Lorenzo Ghiberti. Another was made under his direction, assisted by many other artificers. Fifty years were employed in making and completing them. The most ancient was made by Andrea of Pisa.

The Baptistry of Pisa, erected between the years 1152 and 1160, by Diotisalvi, is of a singular design. The plan is circular, with a diameter of 116 feet; the walls are 8 feet thick; the building is raised on three steps and surmounted with a dome in the shape of a pear. The external elevation is divided into three storeys; in the basement the columns, twenty in number, are engaged, and have arches springing from column to column, with a bold cornice above; in the first storey the columns are smaller, stand out in relief, and are placed closer together, and the order is surmounted with pinnacles and high pediments, placed at equal distances: the terminations of these parts are crowned with statues. Above this is an attic storey, decorated with other high pediments, pinnacles and statues. The dome, which is covered with lead, is intersected by long lines of very prominent fretwork; all the lines meet in a little cornice near the top, and terminate in another dome, above which is a statue of St. John. The interior is much admired for its proportions: eight granite columns, placed between four piers decorated with pilasters, are arranged round the basement storey, which support a second order of piers, arranged in a similar manner, on which the dome rests, which is famous for its echo, as the sides produce the well-known effect of whispering-galleries. In the plan drawn by J. and F. de Milanis, preserved in the British Museum, columns are not shown in the interior. In the middle of the baptistry is a large octagonal basin of marble, raised on three steps. Within the basin there are four circular places hollowed out for water, and round the centre of the basin, which is occupied by a pedestal, is a place likewise hollowed out for the priest, who was thus enabled to turn from one basin to the other. By this means confusion was prevented, which would otherwise have occurred from the crowd pressing to one side of the font only. The city of Ravenna and the episcopal cities of Tuscany have also their baptisteries.

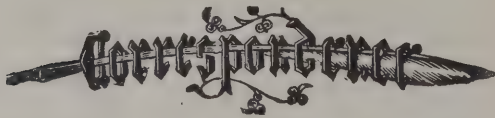
The largest known baptistry ever erected was that belonging to the church of St. Sophia at Constantinople, which is said to have been so spacious as to have once served for the habitation of the Emperor Basil; and in it also a very numerous body of persons once assembled in council.

The multangular edifices placed at the sides of cathedrals, which are called chapter-houses, are very similar in plan to the ancient baptistry. It is possible that they were originally used for that purpose. Bede mentions a wooden oratory built in haste at York for the express purpose of baptizing Edwin, King of Northumberland, on Easter Day, A.D. 627, from which circumstance it would seem that baptisteries were formerly erected in England. The baptismal font is not synonymous with baptistry, but should be applied only to the large stone vessel placed in the centre of the baptistry. At the close of the sixth century the baptismal fonts belonging to baptisteries began to be placed in churches. At a font placed in a church the French king Clovis received baptism at the hands of St. Remis, archbishop of Rheims.

CHURCH BUILDING AND RESTORATION.

Berwick Church, Shrewsbury.—This interesting old church, which stands in a charming situation in Berwick Park, has been built at different periods, the older portions of the nave dating back probably to the sixteenth century. Until recently it consisted of a nave, tower and porch. The tower was built about the year 1672 by Sir Samuel Jones, who endowed the church and built and endowed the adjoining almshouses and hospitals. The church has recently been enlarged by Mr. James Watson, for many years M.P. for Shrewsbury, by the erection of a new chancel, south chancel aisle, organ-chamber, clergy and choir vestries and north and south porches, which were consecrated by the Bishop of Lichfield on the 28th ult. The buildings are of Grinshill stone in the Classical style of the buildings of the seventeenth century. The semicircular chancel arch is the full height of the nave, so as to afford an uninterrupted view of the east end. There are four mullioned windows lighting the chancel and organ-chamber. The ceilings are semicircular vaults panelled with moulded ribs. The east window has been filled with richly stained-glass by Messrs. Comere & Capronnier, of Brussels, representing "Christ Blessing Little Children." The other windows are in geometrical patterns, by Messrs. Camm

Bros., of Smethwick. The handsome seventeenth-century wrought-iron altar railings have been restored and refixed. The chancel is paved with encaustic tiles from Messrs. Godwin's Lugwardine Tileries, Hereford. The south chancel aisle contains oak seats for the inmates of the adjoining almshouses. The ancient oak pulpit has been restored and refixed. The oak choir seats, prayer desk and eagle lectern have been made by Messrs. Jones & Willis, from designs prepared by the architect. The two-manual organ has been erected by Messrs. Walker & Sons, of Francis Street, Tottenham Court Road, and is a very fine and powerful instrument. The whole of the walls of nave and chancel from floor to ceiling have been panelled in oak with carved cornices, the east end having emblematical carvings by Mr. T. Catley, of Kennington, London. The hot-water heating, gas-fittings and ironwork are by Lea, Sons & Co., of Shrewsbury. The whole of the works have been carried out from the designs and under the superintendence of Mr. F. B. Osborn, architect, of Birmingham, the contractors being Messrs. W. Bowdler & Sons, of St. Julian's Friars, Shrewsbury, Mr. James Thornclow having been clerk of the works.



Ventilation and Flushing of Sewers.

SIR,—Having for some time been watching the development of sewer ventilation and its effect on public health, I read with considerable interest your extracts from the report of Dr. Clark on the above subject in a recent number.

The fact of the deposit of soil on the highly-glazed ware of the syphons attached to the modern wash-down closet is patent to all, as is also the fact that it does not appear to be affected by the periodic flush of water, but requires something with a greater abrasive power than water to effect its removal. This deposit takes place to a much greater extent in the rougher sewer-pipes, and it is undoubtedly by the decomposition of the lining so deposited that the disease germs are evolved, more than by the decomposition of the sewage as it is flowing to the outfall. While, therefore, the copious and periodic flushing of sewers is undoubtedly a potent factor for the good of the public health it is by no means all that is required.

Except, perhaps, after heavy rains, when a quantity of abrasive matter has been carried through the drains, this decomposing lining is always present in the sewers and evolving the gases so noxious to health, and the wisdom of providing such ample and ready means for those gases to escape into the streets certainly admits of question.

Beckenham, it is stated, has ventilators at every 82 yards, and is admirably sewered, but my own experience is that from these ventilators very strong and evil-smelling gases emanate. Are these gases, on account of being diluted with air, altogether innocuous? The instances quoted in the case of Woolwich and Plumstead seem conclusively to prove that they are not innocuous, and that being so, would it not be infinitely better to confine these gases as much as possible in the sewers, rather than to dissipate them into the air in our streets, where they are liable to be inhaled with more or less dangerous results to the persons so inhaling them?

The advisability of ventilating our sewers so that the danger through inhaling any gases which may by any chance be forced out of them would be minimised is unquestionable, and of course it is necessary to provide means to equalise the atmospheric and sewer-air pressures, so that by no chance could the sewer gases be forced past the syphons and traps into the houses.

Are not both these points sufficiently provided for, by constantly circulating a smaller quantity of air through the sewers by means of ventilators, which by heat or other means render the gases passing through them quite innocuous so far as their power to produce disease is concerned? There are several such ventilators; it has been objected to them that they are expensive to maintain in working order, and that the gases after passing through them are not devoid of smell. With regard to the expense, has not the mistake been made of providing too many of them? With regard to the other objection, any one encountering the gases emitted from the ventilators would know that beyond the fact of the smell being disagreeable there was no harm, and would be saved the involuntary shudder often experienced now when unexpected, by inhaling some of the gases which the authorities have been at such trouble to convey to us direct from the sewers.

Where the sewer gases are delivered into the outer atmosphere without treatment of any kind, the higher from the streets such outlets are the better, but the disfigurement caused by these tall ventilating shafts is very great and unfortunately is very much in evidence in some of our most beautiful towns.

Often the tops of these shafts are to be seen level with and at no great distance from bedroom windows, and it does not seem too much to suppose that by their means the disease germs in the gases find their way into the bedrooms.

The shafts at Beckenham are not unsightly, but they are certainly not high enough to dissipate the sewer gases without offence and perhaps danger to the public.

They would be amply tall enough, however, if the gases were first rendered innocuous, and this at the present time, when appearance justly counts for so much, is another strong argument in favour of these germ-destroying ventilators.

Again, these ventilators, when heat is the destroying element, induce a strong upward current through them, and with them there is much less likelihood of finding that the surface gratings act as outlets for the sewer gases, as is too often the case where tall shafts are in use.

I am strongly of the opinion, and think that Dr. Clark's report fully supports me in this, that it is not in the absolute confinement of the gases in sewers nor in the free dissipation of them in our streets that the greatest safety to the public health is to be found, but in a happy medium where the gases are fairly diluted in the sewers and at the same time the gases withdrawn from them are rendered innocuous before people are given the chance of breathing them.—Yours faithfully,
ENGINEER.

GENERAL.

Forty-two Sets of Designs were sent in for the proposed market in Weston-super-Mare. The winners of premiums are Messrs. Price & Wooller, Weston-super-Mare; Messrs. Wilde & Bryan, Weston-super-Mare; and Mr. Daniel Arkell, Birmingham.

Mr. H. L. Hammack, architect and surveyor, who died recently during a tour in Germany, was one of the oldest members of the Corporation of London, for he was elected to the Court of Common Council in 1865, and was annually re-appointed down to this year. In 1881 he was made deputy-alderman of the ward of Bishopsgate. He was one of the lieutenants for the City and the Tower Hamlets, and a Justice of the Peace for the county of London. Mr. Hammack was in his sixty-eighth year.

The Duke of York will lay the foundation-stone of the new Birmingham Hospital to-morrow. The cost of the building will be 200,000*l.*, or about 360*l.* per bed, of which sum the committee have raised about three-fourths.

A New Hotel containing forty-five bedrooms is about to be erected at Hunstanton, by Mr. Thomas Rose, of Norwich.

Mr. J. G. O'Sullivan has been elected sanitary engineer for Dublin. The other selected candidates were Mr. Lawless, C.E., Mr. MacDermott, Mr. Sutter, C.E., and Mr. Petit Wardrop.

The Cleethorpes Hall Competition has been decided. The first prize has been awarded to Mr. John R. Withers, Shrewsbury; the second to Mr. Solomon Ford, Queen Street, Cheapside; and the third to Mr. J. Mitchell Bottomley, Middlesbrough.

Mr. D. H. S. Cranage, M.A., will deliver a course of twelve University Extension lectures in Newcastle-upon-Tyne, on "Gothic Architecture," commencing on the 20th inst.

An Urgent Appeal is being made, says the *City Press*, to the charitable public for the sum of 5,000*l.* to defray the cost of the extension of the Central London Throat, Nose, and Ear Hospital, Gray's Inn Road, which is rendered necessary by the overcrowding of patients.

The London Tramways Company are having cars on their Streatham Hill route fitted with the incandescent lamps.

The Directors of the French School of Archaeology at Athens propose to excavate the site of the Temple of Athene Alea at Tegae. The sculptures of this most important building were by Scopas, and a few fragments brought years ago to Athens are the best data possessed for judging of the style of that sculptor. A committee has been appointed to consider a scheme of excavation.

The Employés of the firm of Messrs. S. Pearson & Son, engaged in the construction of the Blackwall and East Greenwich Tunnel, recently presented Sir W. and Lady Pearson with a testimonial in the form of a sterling silver model of the caisson used in the boring of the tunnel, and which was executed by Messrs. Mappin Bros., of Cheapside.

Sir F. de Winton has informed the Mayor of Leeds that the Duke and Duchess of York will open the new buildings at the Yorkshire College on Friday, October 5.

The Liverpool School Board have decided to purchase for 5,000*l.* 1,505 square yards of land at the corner of Pleasant Street and Clarence Street for the erection of a new pupil-teachers' college.

The Architect.

THE WEEK.

ANCIENT Egypt will always have a fascination for one class of students. There is a mystery about it which gives a piquancy to investigation that is not afforded by any other region. The late BRUGSCH PASHA, who died in the pleasant suburb of Charlottenberg, near Berlin, on Sunday, was one of those fortunate students who can indulge their hobbies in official positions. Forty years ago Professor BRUGSCH was sent to Egypt by FREDERICK WILLIAM IV. On his return he was appointed keeper of the Egyptian Museum in Berlin, and if he is to be credited with the systematic arrangement of the contents he merited the thanks of all Egyptologists. He brought out a noble work on the Egyptian monuments. The years 1857 and 1858 were spent by the Professor in Egypt. In 1860 he was attached to the Prussian Embassy in Persia, and after the death of the Baron VON MINUTOLI he became its director. He travelled through the greater part of Persia, and in 1861 he wrote an account of the mission. Professor BRUGSCH became Prussian Consul in Cairo in 1864. After four years he returned home, and was appointed Professor of Egyptology in Göttingen. Two years afterwards he went back to Egypt as director of the Ecole d'Egyptologie in Cairo. He aided in organising the Egyptian departments in the Universal Exhibitions in Vienna and Philadelphia. The downfall of the Khedive ISMAIL ended his official connection with Egypt, and once more he returned to the Fatherland. He was a perfect type of the Prussian official and professor. BRUGSCH possessed the deepest knowledge of Egyptian antiquities, but he was also an organiser and man of business. The duties of every office to which he was appointed were performed with military precision.

As long as the Metropolitan Building Acts are in operation it is not wise for contractors to evade the provisions. The operations which were explained in a case that was heard a few days ago at the North London Police Court by Mr. HADEN CORSER cannot, we are sure, have the approbation of any builders' society. Messrs. SILK were summoned by Mr. LEGG, the district surveyor of Hackney, "for that they did, contrary to the Metropolitan Building Act, cut into the party-wall between Nos. 413 and 415 Mare Street, Hackney, by inserting a rain-water pipe without previously giving notice to the district surveyor." The builders were also charged with omitting to reopen the work for the inspection of the surveyor. The charge relating to the notice was withdrawn on technical grounds. Mr. LEGG stated that on June 14 he saw defendants inserting drain-pipes in a party-wall, for which notice was not given. Afterwards notice was sent. When he next visited the wall Mr. LEGG found the bricks were reinstated. The defendants declined to open the wall for inspection until they obtained the owner's consent. The surveyor was then informed that the consent would not be given. For the defendants it was pleaded that they had left the premises, and according to the judgment of the Queen's Bench, when reversing a decision of Mr. CORSER's in a similar case, that rendered them safe from liability. The magistrate considered he was bound by that case. The Queen's Bench Division had decided that if the work had been completed the district surveyor had no remedy. In his opinion the judgment placed a premium on law-breaking. All that a builder had to do where there was an irregularity was to keep quiet until the work was completed and then the district surveyor had no remedy. The summons was therefore dismissed. The duties of district surveyors are not always agreeable to builders, but as they are not creations of those officials there can be no advantage gained in putting them to inconvenience. In the present case Mr. LEGG has suffered for being lenient. He should have enforced the Acts forthwith. The result must cause other surveyors to be more exacting, and in that way the building trade will not gain much by the temporary success of one firm.

A MANSION has been constructed in the Avenue Hoche, Paris, from the plans of M. RICARD, containing thirty-five

sets of apartments. For some a rent of 24,000 francs a year is demanded. One of the features of the building is a gorgeous salon which is at the disposition of the tenants in succession. It will accommodate over six hundred visitors comfortably. In addition there are small salons on every floor. It has been calculated that if an income of 1,000 francs a day can be derived from the building, the proprietors will not gain more than 3 per cent. on the outlay.

ON Wednesday Mr. JAMES TAYLOR died near Liverpool. He might be associated with Mr. JOHN LAIRD as one of the creators of Birkenhead. According to the *Liverpool Courier*, Mr. TAYLOR belonged to Glasgow, where he was born in 1817. For some time he was connected with the firm of Messrs. FOX, HENDERSON & Co., of London and Birmingham, but in 1852 he came to Birkenhead and established the Britannia Works, which quickly became one of the most important concerns of its kind in the country. He was the inventor and builder of many of the largest steam cranes now in use in the United Kingdom, and at the time of his death he was busily engaged in perfecting these marvellous pieces of engineering skill. Mr. TAYLOR was also the inventor of the floating graving-dock. He was one of the most skilful as well as one of the most courageous pioneers of engineering works.

THE following resolution was adopted at the meeting of the Associated Chambers of Commerce on Wednesday:—"That it is desirable that an authoritative standard of measurement of foreign-imported balk timber be established for all purposes, and that the measuring authority mark the ship's initials, the number and the contents upon each place in the most unmistakable characters (the authority measuring for the purpose of payment of sea freight appears to be the best and most convenient one), and that the executive be asked to take the necessary steps to bring about such an enactment." The arrangement is already adopted in some ports, and has worked well. There would be an advantage if it could be adopted generally.

THE inquiry into the character of Roman fortified lines, under General VON SARWEY and Professor HETTNER, is likely to produce information in Britain as well as in Germany. The examination in the North of England of HADRIAN'S wall has been in progress until the end of August, and will be resumed during next summer. From the cuttings which were made at Lanercost, Greatchesters, Whiteloss and Brunstock, in Cumberland, it is concluded that the defence was constructed on the system which prevails in railways, or, in other words, the embankment or mound was made out of the cutting of the central ditch. It was revealed that near the wall was an excellent-paved footpath as well as a military road. A turret and walls of other buildings were met with at Greatchesters. The German excavations have been very successful this year. At Hofheim, between Wiesbaden and Frankfurt, the remains of a fort about 600 feet square were discovered, which from its position was intended for the observation of the Rhine Valley. The fort at Zugmantel was ascertained to be an enlargement of a more ancient structure. Several ditches and mounds which remain are supposed by Herr JACOBY to have been intended to serve as fixed points for the Roman surveyors when laying out camps and boundaries.

FORTUNE was not kind to the French in their explorations on the site of the Temple of Apollo at Delphi. M. HOMOLLE, the director, is compelled to own that it is remarkable to find in the course of excavations so extensive so small a number of architectural fragments, while there has been a total absence of examples of decorative sculpture. He believes the Roman emperors removed piece by piece the two groups which PAUSANIAS described, as well as the metopes. M. HOMOLLE believes there were only six columns in the façade of the temple. The sides were very long, but the number of columns cannot be stated with accuracy at present. The unearthing of the temple and the sacred inscriptions are a recompense for all the trouble and expense. Since he prepared his report we understand M. HOMOLLE has been rewarded by the discovery of two archaic statues at Delphi.

POLYGNOTUS THE WALL-PAINTER.—II.

IF we can suppose that POLYGNOTUS was the friend of CIMON, and stood on the same footing as PHIDIAS with PERICLES, the painter was not likely to have remained in Athens after the banishment of his patron, which took place about the year B.C. 457. His painting of *The Slaughter of the Suitors by Ulysses*, in the Temple of Minerva at Platea, his works for the Thespians, and his two immense wall-paintings in the Lesche, at Delphi, might then be considered as the productions of his voluntary exile. With no less reason it can be supposed that those works were executed prior to the appearance of the painter in Athens. On what grounds he was selected by CIMON cannot be determined. As there is no mention of wall-painting by POLYGNOTUS in any part of Thasos, his early reputation may have been gained by portable works which were of a character that made them suitable for presentation in temples. Was it possible for CIMON to conclude from seeing them that the artist was competent to produce wall-paintings on a grand scale that would be worthy of Athens, as the capital of confederated Greece? Some speculators have hesitated to accept that conclusion. They believe it is more reasonable to assume an earlier practice in wall-painting by POLYGNOTUS, and that his works in the Lesche, at Delphi, were of prior date to those in the Athenian Stoa. The difficulty is only evaded by that reasoning, and is not overcome. The people of Delphi must have had some evidence of his competence before they entrusted a building to his operations, and they were probably as fastidious critics as the Athenians. Although the French explorers are disappointed by the result of their recent excavations, they do not suggest that the wealth of the city was exaggerated. Repeatedly Delphi was subjected to plunder, for it was the most favoured of all the Grecian shrines. The presents of devotees made of it an unparalleled museum, and with the most beautiful examples before their eyes the people were not likely to encourage unskilful painters. CIMON's influence was strong enough to gain at least temporary tolerance for defective work in Athens, but in Delphi there was an oligarchy with severe views about what was worthy to be submitted to their eyes. On the whole, therefore, it seems more reasonable to believe that when POLYGNOTUS arrived with the intention of embellishing one of the buildings of the sacred city, his reputation as a mural painter was established by his work in Athens.

Whether his paintings in the Delphian Lesche surpassed those in the Poecile Stoa is never likely to be revealed. It is certain, however, that the two in the Lesche are the most carefully described of all his works; indeed, there were no ancient examples which were favoured with such long notices by PAUSANIAS. Unfortunately, with all his elaboration it is not possible from what he says to comprehend the arrangement of either of the paintings. No canons which are now respected will apply to them.

Painters are expected to have a definite point of view when treating a subject, and they are also supposed to limit themselves to the action of a moment. As we stated last week, the works of POLYGNOTUS suggest that he insisted on more liberty. In what way he exercised it we have no means of knowing. He may have separated the various scenes which made up his pictures by definite bordering lines to prevent confusion. On the other hand, we know from the Parthenon Marbles that Greek artists were not rigorously bound by ordinary laws of fitness, for figures of deities who are supposed to be seated on Olympus are introduced among the people who take part in the Panathenaic procession, regardless of their incongruity. In some sculpture, like the frieze of the Lysicrates Monument, which has survived, it is also evident that synchronism is not respected. The architectural requirements enforced more or less regularity and symmetry in sculpture. In treating a large wall there was more opportunity for license, and if POLYGNOTUS introduced intervals between his scenes, it is not clear how they could avoid the appearance of a sort of irregular patchwork.

The Lesche was a place of public shelter in which the Delphians could discuss theological, philosophical, political, domestic or other subjects at their ease, while enjoying the spectacle of one of the finest landscapes in all Greece. It was apparently more architectural in character than the

Stoa in Athens, which ZENO and his disciples honoured by their presence. As a consequence, the wall-paintings by POLYGNOTUS remained longer in a perfect state than his works in Athens. He undertook the painting of the two side walls, which were the longer. The subjects selected related to the Downfall of Ilium and the Visit of ULYSSES to the Shades. Both were Homeric, but the scenes did not exactly correspond with those described in the "Iliad" and "Odyssey."

On the right-hand side as one enters, says PAUSANIAS, one sees that Ilium is captured and the Greeks are about to depart. A modern painter would be likely to represent that scene by placing the sable ships in front with the sailors busy, a crowd of troops and captives in the middle distance and the ruins of Troy in the background. The Greeks could not appreciate that sort of arrangement. They may not have been adepts in perspective, but if they were it would not be of much use to them in historical pictures. It is only necessary to study a photograph of a large group to realise the difficulty of compelling subjects to become subservient to the needs of composition. All the elements have an equally strong desire to excite attention. In Greece the desire was not quite so selfish, for what was sought was recognition of the importance of the representatives of a family or a town or a district. According to SPENSER, the Irish bards were ready to extol a young outlaw for the share of a stolen cow, and "then waxeth he most insolent and half-mad with the love of himself and of his own lewd deeds; and as for words to set forth such lewdness, it is not hard for them to give a goodly and painted show thereunto, borrowed even from the praises which are proper to virtue itself." It is evident that in HOMER's day there was no less eager a desire to have a goodly and painted show made of deeds that were as immoral as those of the Munster rapparees, though in course of time they were supposed to be sublime. HOMER tried hard to earn a reward by liberality in awarding praises, but the demands were more than he could manage, and he settled accounts with the surplus by his Catalogue of Ships. A liberal patron found one of his ancestors performed a heroic act; a stingy one could not expect more than to see the name of his native village mentioned in the Catalogue of Ships, without even the distinction of a characteristic adjective. In art we see evidence of a spirit no less exacting. It shows itself in the employment of one plane for subjects, and in the care which was taken in the pictures of POLYGNOTUS at Delphi to arrange the groups in such a way that the characters could be identified, an end which was further secured by inscribing names near the figures, which was also a common practice in vase-painting. How far the selection of subjects was inspired by local interest in men and women must be left to surmise, and it is not impossible that some figures were introduced to cause dissatisfaction to enemies of the Delphians.

From the incidents which were represented the spectator saw that Troy was conquered, some of them taking place within the town and others outside. If the painter wished to suggest that war does not in reality come to an end as promptly as it does on a stage, he could not have adopted a more effective way. The first pictures of the series which met the eyes of visitors were those which suggested the attainment of that end which "the princes orgulous, their high blood chaf'd," sought when they set out from Greece. HELEN, it would be seen, was about to return to Sparta, and was depicted as seated. She was guarded by DIOMEDE, and accompanied by BRISEIS and other women, who seemed to be fascinated by that fatal beauty which brought woe to them as to many others. Preparations for her departure were in progress. Men were removing the two tents of MENELAUS, and on board his ship the sailors were engaged, under the direction of PHRONTIS, who, according to HOMER, was "a mariner past all expert, whom none in steering matched when tempests roared." The three pictures formed the climax of the series.

But for the triumph of the Greeks the Trojans were compelled to suffer, and the remaining paintings were devoted to representations of the last effects of the contest. HELENUS, the wise son of PRIAM, was seen in a dejected state, clad in sad purple, and near him were three wounded chiefs. Two figures recalled one of the consequences of

ancient warfare. *ÆTHRA*, *PITTHEUS*'s daughter, the mother of *THESEUS*, was a prisoner in Troy attending on *HELEN*, but there was no league formed to accomplish her rescue. The woman escaped, and in the picture she was seen appealing to *DEMOPHON*—who was her grandson—for her liberty, to his apparent confusion. Then came *ANDROMACHE* and some of *PRIAM*'s daughters, and in front of *HECTOR*'s wife was a boy. Two other groups of captive women were shown in this part of the picture, and as four of them were seated on a couch, it is not unreasonable to assume that the three groups were not supposed to be outside the walls; and if that could be allowed it would help us towards determining the arrangement.

NESTOR was introduced as holding a spear and wearing a pileus instead of a helmet. He must have been represented as standing or seated on the shore, for beside him was a horse which was about to roll itself in the sand; and, moreover, *PAUSANIAS* refers to the pebbles which were in front. *POLYGNOTUS* may have intended to contrast the success of the old hero, symbolised by the possession of one of the famous Trojan steeds, with the fate of *PRIAM*, whose corpse was seen in another part of the picture. *PAUSANIAS* next refers to the nude figure of *EPEIUS*, who appeared to be engaged on the demolition of the Trojan wall, that was further indicated by the introduction of the wooden horse, which he constructed.

Another group, one of several figures, follows in the description of *PAUSANIAS*. It represented the declaration upon oath of *AJAX OILEUS*. That warrior was alleged to have outraged *CASSANDRA* in the Temple of *Athene*, and in consequence he and the other Greeks were storm-tossed after leaving Troy. In the painting, says *PAUSANIAS*, *CASSANDRA* is seated on the ground holding the figure of the goddess, which she retained when dragged away. *AJAX* with a shield stands near an altar. The witnesses were *AGAMEMNON* and *MENELAUS*, *ULYSSES* and others. Another crime of the Greeks was also depicted. *NEOPTOLEMUS* having slain *ELASUS*, appeared as killing the wounded *ASTYNOUS*.

Several single figures and groups of two are mentioned. A boy was shown clinging to another altar on which a cuirass was placed, and beside it was *LAODICE*, the most beautiful of all *PRIAM*'s daughters. There was also a bronze basin on a stone base which was held by *MEDUSA*, another of *PRIAM*'s daughters. Near her was an old woman holding a child that was in terror. Then came figures of slain warriors, who were lying on the ground, old *PRIAM* being among them. *SINON*, a companion of *ULYSSES*, was seen carrying the body of *LAOMEDON* to burial. In the last place appeared *ANTENOR* and his family, on whose house was hung a panther's skin, which was a sign the place was to be respected by the Greeks as a return for his hospitality. The prince and his children appear as if about to depart from Troy, and thus the two extremities of the series were marked by preparations for a journey, but under very different conditions.

PAUSANIAS was only human, and his attention may not have been concentrated with equal force on every part of the paintings. In our time it would be impossible to realise the contents of a wall in a picture exhibition from the descriptions in the journals. Some works are passed over, in others only the principal figures are noticed. What happens constantly in London and Paris might be excused in Delphi. It is also a fact, every modern guide-book is incomplete in its description of galleries, and *PAUSANIAS* was compelled in his day to consider the limited curiosity of his readers. If he were exhaustive they would be bored, and he evidently was not troubled about the desire for information by people who were to live in *Ultima Thule* eighteen hundred years afterwards. On that account the utmost caution should be exercised in all attempts to realise the decoration of the Lesche.

Let us assume, however, that the descriptions are complete. What must first strike a restorer is the difference between the groups which arises from the number of the figures. While only two figures are mentioned in some cases, in others there are seven. Pictures with single figures like *EPEIUS*, who we are to imagine was able without other aid to throw down the walls of Troy, and *NEPTUNE* with his tumbling horse, are also puzzles. Scholars were satisfied when they were able to imagine or to indicate by

feeble sketches a few scenes that seemed to correspond with the descriptions. But can we imagine that Greeks were able to consider a wall was decorative which in the remotest way corresponded with the realisation which the two *RIEPENHAUSEN* attempted in their "Erläuterung des Polygnotischen Gemählde auf der rechten Seite der Lesche zu Delphi"? To powder a wall irregularly with conventional ornament in Japanese style is not unsatisfactory if there is not over-much affectation apparent, but it is different when the powdering is made up of elaborate groups of warriors and long-robed women, mixed with single figures standing or supine. It is not sufficient to arrange the compositions in several rows, for if horizontal order is obtained the vertical disorder becomes more astounding.

If we are to take the descriptions of *PAUSANIAS* as exact, we are compelled to conclude that he adapted his paintings to suit wall space that was cut up by a variety of dividing lines. Where there were broad spaces available he made use of subjects like the Swearing of *AJAX*, while in limited spaces he introduced groups of two or three figures or single figures. That, we consider, is the most rational way of considering the subject, but as generally little thought is bestowed on the character of the wall space in the Lesche, it is no wonder that the attempted restorations of the pictures are suggestive of works that are semi-barbarous.

On the opposite wall *POLYGNOTUS* attempted what was the most difficult of all subjects. When *ULYSSES* was told by *CIRCE* that he must visit *Hades* in order to consult the blind *TIRESIAS*, he confessed that his courage failed him, and he spent the day in weeping. To the Greeks there was nothing unmanly in his fears, for what could be more awful to so active a race than life in the dreariest of regions? All that was enjoyable was absent from it, and *ACHILLES* expressed the general belief in saying it was preferable to be a hind in Greece than to reign in the shades. *POLYGNOTUS* did not extenuate any of the horrors. *DANTE* and *MICHEL ANGELO* would have been in an ecstasy if they saw the pictures. He represented in one of them *CHARON* conveying a party across *Acheron*, and among the crowd in the boat was a priestess of *CERES*, in *Thasos*. On the shore could be seen a father strangling an ungrateful son, and a fury (*LESSING* says a Greek never painted one) torturing a man who committed sacrilege. The figure of *EURYNOMUS*, the god of vampires and vultures, was, according to *PAUSANIAS*, a wonderful bit of painting, for his flesh was blue and black like the big flies that are to be seen alighting on meat. Another painting represented the scene in the eleventh book of the "Odyssey," where *ULYSSES* on his knees guards the hollow which contains the blood of the victims, a draught of which enabled the ghosts to recognise mortal visitors. The figures of *TIRESIAS*, the seer, *ELPINOR* and others, including the mother of *ULYSSES*, appear anxious to regain memory on any terms. There are also ghosts who were doomed to fearful sufferings, such as *CENEUS*, who afforded a perpetual meal for an ass; *TITYUS*, whose liver was inexhaustible for a vulture; *PHEDRE*, whose hanging was continuous; *SISYPHUS*, *TANTALUS* and others. The Homeric heroes suffered in their minds if their bodies escaped. *HECTOR* appeared seated and clasping his knees, a sort of statue of hopelessness. *AJAX OILEUS* had still the foam of the waves upon him. *AGAMEMNON* could not escape from his paternal, imperishable, golden-studded sceptre, and must have appeared as an ancient Commissioner *PORDAGE*. If *POLYGNOTUS* was not a pessimist, he did his best to convince others of the vanity of eternity as well as time. Happily the Greeks were able to take the doctrines as if they added a zest to life, and as they tried to enjoy all around them they may have often smiled before the *Halls* in the Lesche. An artist's talent is only adapted to express beauty; the exciting of terror is beyond him. Hence it is so many paintings of the same class as the *Hades*, which are found in Christian churches, have become incumbrances, and tourists are not afraid to make mockery of the great work of the Florentine.

What became of *POLYGNOTUS* is among the unknowable events. As an artist he may have prepared the way for *PHIDIAS* as for *APELLES*; but successful men like them rarely care to acknowledge indebtedness to predecessors. As has happened with many another painter, nothing has

survived to enable a later age to judge of the value of his works, and his merits must be taken on extrinsic evidence. But POLYGNOTUS will at least always remain as a tantalising object, and the descriptions of his works will be an endless puzzle.

GLASGOW ARCHITECTURAL ASSOCIATION.

THE monthly meetings of this Association have just been resumed. Mr. Alexander N. Paterson, M.A., delivered the presidential address. He first reviewed the work of the past decade, and found in the record of its meetings, visits, designing competitions and publications reason for congratulation. The average roll during the period has been over 100, between 60 and 70 of whom are architectural draughtsmen and pupils, yet after all that is less than a half of those employed in the different offices. Mutual benefit would result from their becoming members. The President further spoke on the propriety of the three architectural bodies in Glasgow consolidating. The second part of the address was devoted to a consideration of how far style in architecture may be followed, while yet preserving the individuality of the designer and having regard to national characteristics. History proves that no abiding style had ever been of forced growth; the outcome of express desire for an architectural change, and the mere introduction of new materials is not sufficient; glass and iron have not altered the essentials of style. Revived Classic—the architecture of the Renaissance—was incontestably the architecture of modern civilisation; its adaptability was established, and its restraints are no curb to true originality, as all may see who study the work of the early Italian architects. A terrible monotony in this cosmopolitan style is obviated by national characteristics of material and social customs, and of these Scotland has her share. The remainder of the address was the elaboration of this idea, that the Scottish phase of the Renaissance is worthy of study, and should be fostered. The vote of thanks was moved by Mr. Conner, vice-president, and supported by Mr. Campbell Douglas, hon. treasurer. The meeting resolved to forward a memorial to the Town Council regarding the Tron Steeple, urging that it be left as it is at present. Attention was also directed to repairs in progress at the cathedral of indifferent character, and it was remitted to a committee to investigate and report.

THE STORY OF A BAS-RELIEF.

A CORRESPONDENT of the *Glasgow Herald* furnishes the following record of the adventures of a representation of one of the corporate worthies or Nicol Jarvies of the last century, the Provost Archibald Ingram:—There is, as far as known, no picture of Provost Ingram—at least none could be heard of for "Old Glasgow"—but the provost appears in a bas-relief which is fixed above the fireplace in the directors' room of the Merchants' Hall. In this bas-relief he forms the centre of a group; he kneels to receive a civic crown at the hands of the Genius of Glasgow; the geniuses of commerce, architecture and civic rule stand behind him and smile on the function. The provost's figure is evidently from nature; the others, I believe, are ideal. The bas-relief has a history.

At a meeting of the Merchants' House on June 13, 1809, Mr. John M'Caul intimated that Mr. Robert Ingram, of London, a grandson of the late Provost Ingram, had sent down a monument to be placed in one of our public halls in memory of his grandfather; further, that Mr. Gilchrist, of Edinburgh, a near relation of the provost's, had requested that the monument should be placed in the Merchants' Hall. The House thereon agreed to Mr. Gilchrist's request, and appointed Dean of Guild John Hamilton, of Northpark, and three others a committee to carry the same into execution. From whatever cause, Northpark and his three colleagues did not carry the same into execution, and Provost Ingram and the geniuses vanished for over half a century. It is uncertain exactly how they spent the interval; the Merchants themselves spent it mostly on the tramp.

In 1809, when Mr. M'Caul intimated the receipt of the bas-relief, the Merchants were housed in their hall in the Briggate, built, or rather rebuilt (as M'Ure tells us), "in a most stately manner in the year 1659, Sir John Bell being dean of guild and Sir William Bruce architect, a magnificent structure of length from east to west 72 feet; the steeple thereof hath three battlements of curious architecture above one another, and a curious clock of molten brass, the spire whereof is mounted with a ship of copper, finely gilded, in place of a weathercock." But in 1817 the Merchants resolved to move from the Briggate to a "genteel and central part of the town," and sold the magnificent structure to a builder, who pulled it down forthwith, and on the site built "Guildry Court." In the sale the steeple was "retained entire as an ornament to the city, with a servitude of access." A tasteless Merchant wished to bind the builder

to a building plan that should show off the steeple from its base; the House promptly sat on him. The whole "beauty of the steeple was in the upper part above the clock;" the lower part was thoroughly unclassic, Scotch in fact, "a naked square tower, which had better be hid," and effectually Guildry Court hides Sir William Bruce's rude old structure. After evicting themselves from the Briggate the Merchants were a long time of having another homestead of their own. They had long debate over a new hall; it was to be much above the scale anno 1659; it was to be in a genteel and central part of the town. Where was the money to come from? Where was the hall to be? They had no need to hurry over the matter. By the kindness of the town they were lodged in the Town Hall at the Cross, comfortably and cheaply; they paid for some cleaning and painting, but they paid no rent. They saw their way first to the ways and means for their new hall; they were worse put to it to choose among various sites offered them in Queen Street, in Virginia Street, and elsewhere; at last they fixed on a site in Hutcheson Street, Eastside, and in 1843 they took possession thereof of Hall III. They were not allowed to rest there long. In 1869 they were evicted (per Act of Parliament) by the Court-House Commissioners, and left to shift as best they could. They again found friendly shelter. The Chamber of Commerce was then quartered in the Bible Society's Rooms at the corner of Virginia Street and Wilson Street, on the present site of the Law Life Insurance Society, and it made room there for the Merchants. Neither Chamber nor House is in constant session, and the two chummed on a Box and Cox arrangement, and got on so well that they have chummed so ever since. At last, in 1877, just two generations after their flitting from Hall II. in the Briggate, the Merchants installed themselves, surely this time for good and all, in Hall IV. in George Square. Part of Hall III. became the Sheriff's Small Debt Court, and is so now; part of it which became the City Chamberlain's office has been empty ever since the opening of the new City Chambers, and has now the forlorn dilapidated look of a Plan of Campaign homestead.

The Ingram bas-relief has meantime had many wanderings, but it has wandered home at last. The early moves can only be traced by conjecture. In Old Glasgow storage (nowadays only too plentiful) was scarce, and too much advantage was taken of the ample capacity (72 feet from east to west) of the Merchants' Hall in the Briggate. To check the abuse the House in 1778 decreed that "goods, barrels, timber, or other articles (unless removed on distress of fire or damage by water) should not in future be lodged or stored in the Merchants' Hall or garret above the same." In spite of this decree the Ingram bas-relief was, I fear, lodged and stored in the garret of the Merchants' Hall, and lay there till the Merchants' flitting in 1817. It was then, no doubt, stowed away somewhere about the Town Hall at the Cross. Its next move is certain—it was to Merchants' Hall III., in Hutcheson Street, Eastside, and there in 1859, fifty years after the receipt of it from Mr. Robert Ingram, of London, it was discovered. Its discovery is one of the many good offices we owe to Sir Michael Connal. Nowadays, for the comparatively small sum of one pound one anybody can read about the Ingram bas-relief in the "History of the Merchants' House," but in 1859 this monument of the liberality of Dean of Guild Archibald Orr Ewing and the learning of Collector William Henry Hill did not exist. The manuscript minutes of the House did, however, exist, and Andrew Scott, late of H.M. Customs, had devoted much of his blessed leisure to extracting them. Michael Connal (he was not Sir Michael then), "always roaming with a hungry heart" through Old Glasgow, its records and its relics, came on his old friend's extracts, and hunting through them, caught scent of the Ingram bas-relief. Where was it? No one knew. Since June 13, 1809, there was not a trace of it; its very existence had been forgotten, let alone its whereabouts. But Michael Connal was one of those curious persons one meets every now and again, who positively like trouble, revel in it; and after a long chase he ran the bas-relief to earth in the cellar of Hall III. There it quietly lay in the case in which it had come down from London in 1809; the very straw still wrapped it round. One can see the twinkle in Michael's eyes as they prised off the lid, and the provost and the geniuses leapt to light. The provost, on unpacking, was found a little the worse for wear, but quite mendable; his companions had taken no harm from all their knocking about. They bore the group reverently upstairs to the directors' room, and at their next meeting on June 14, 1859, on the motion of ex-Dean of Guild James Hannan, the directors resolved to make what amends they could for long neglect. At a cost of 14*l.* 10*s.* they had the group "sorted" by Mossman the sculptor, and they set it up above the fireplace in their own room. The ancient request of Mr. Ingram, of London, and Mr. Gilchrist, of Edinburgh, was at last fulfilled, but too late for either of them to know.

Here the provost and his companions rested for ten years, but with the eviction of the Merchants in 1869 their wanderings began afresh. The flitting of the Merchants was a big job—

"muckle ado when burghers ride." As far back as their Briggate days they owned various treasures. They had pictures, many of which look down on us now from the walls of "Old Glasgow," effigies of ancient worthies who had done the House good service in life, or had swelled its funds at death; they had "the gilded broads with the names, designations and sums mortified for the use of the poor old members of the merchant rank . . . likewise a large written broad with Scripture directions how to buy and sell with a safe conscience;" and they had two antique bas-reliefs "all purely cut out of freestone," one of them figuring "three old men resembling the decayed members of the merchant rank," and the other, "a ship with full sails with the arms of the city," relics perhaps of that earliest "almous Hous biggit in the Briggait," which the magnificent structure of 1659 replaced. Besides these Briggate properties, the House now owned the Ingram bas-relief and other treasures that it had accumulated in two generations. On leaving Hutcheson Street they disposed variously of them. They hung the pictures in their new quarters in Virginia Street; they stored the broads (so far as forthcoming) with Bailie Morrison in Sauchiehall Street; the three bas-reliefs (which had been specially exempted from the conveyance to the Court House Commissioners) they sent to Mossman's yard to keep each other company and compare notes as to their adventures. Finally, when they broke up their bivouac in Virginia Street and marched to their permanent camp in George Square, they gathered round them all their treasures. They hung the pictures in the Hall itself and the broads in the Collector's office, and they built the bas-reliefs solidly into the walls. The three old men and the ship with full sails resumed the position they had held in the Briggate:—"The entry to the [Merchants'] Hall is very fine and splendid; above the top thereof are the two bas-reliefs." So M'Ure tells us; and so it has since been done. In Hall III. the two old bas-reliefs were fixed at the entry, and at the entry to Hall IV., very fine and splendid, Kirkman Finlay faces us in his marble toga, and the two old bas-reliefs are fixed right and left on the stair behind him, where one can pretty well make them out on a fine day in June. The Ingram bas-relief is visible every day of the year above the fireplace in the directors' room; the relief is cut deep and sharp in white marble; it has a modern frame of yellow marble, in keeping with the modern chimneypiece, and it bears the inscription:—

ARCHIBALD INGRAM, DEAN OF GUILD

1757-8—1761-2,

LORD PROVOST 1762-3.

Some years later Michael Connal, in hopes of a further find, hunted through the steeple in the Briggate, and, with some risk to life and limb, cleared the rickety ladders to the very top. I am sorry to say he drew the covert blank.

Of Archibald Ingram himself very little is known, surprisingly little for one so notable in his own day. I think he was not Glasgow born—there is no record of his family here, and Ingram is not a Glasgow name. He married Rebecca Glassford, sister of the great Virginian John Glassford, of Douglaston. The Glassfords were bien Paisley folk, and Ingram probably came from the suburb. Only one personal trait is recorded of him—"He was notorious for his niggardly disposition." So says Senex, but Senex's tongue was no scandal. Whatever he was personally, Archibald Ingram was one of those men who have given Glasgow a distinct lift up. He was the father of our printing trade. In 1742 he formed, in conjunction with his brother-in-law Douglaston and other leading merchants, the Pollokshaws Printfield Company, and under that firm founded our first printfield. He chose its site in a triangle of Nether Pollok estate lying between the White Cart, the Auld House (sometimes misnamed the Aloes) Burn and the Main Street of the 'Shaws, then a country road. Here he began in a small way and under many difficulties. He had to spin his yarns and weave his cloth, he had to train his bleacher and his colour mixer, and he had to steal his patterns. For years the company lost money, but Ingram persevered and extended and improved. First and last he feued from Nether Pollok nearly thirty acres Scotch, he changed the course of the burn and formed "reservoir, canals and rivulets"; he levelled and turfed a great bleaching green; he built "printing shops of hewn stonework covered with slate, copper-houses, boiling-houses, drying-shades, callendar;" he went on from the wooden block to the copper-plate, from the copper-plate to the copper cylinder; and he ended with a large and profitable business throughout Great Britain, Virginia, Maryland and the West Indies. Others followed his lead, and before the end of the century there were over thirty printfields in and around Glasgow. Outwith his printing business, Archibald Ingram was one of the founders of the Glasgow Arms Bank in 1750; he was Dean of Guild in 1757 and again in 1761; Bailie in 1753 and again in 1758; finally, in 1762 they made him Lord Provost. He died in 1770, leaving 20*l.* to the Merchants' House, 20*l.* more than he would have left them if he had known how they were to treat his effigy. Happily others

thought better of him. In 1781 the Town Council carried out the greatest town's improvement that had yet been attempted. They made the narrow, crooked Back Cow Lane into a fine street, wide and straight as the Trongate, and they called it "Ingram Street;" eleven years after his death they had not forgotten the father of our printing trade.

Scarce anything is known of Archibald Ingram's family. Rebecca Glassford survived him till 1774. I wish it had been till 1781. William Ingram, of the well-known firm of "Campbell & Ingram," insurance brokers, back of the Exchange; also, I think, of "Jack, Ingram & Co., broadcloth shop, Exchange No. 127," was probably the provost's son; Robert Ingram, of London, was certainly his grandson—*ceteri desunt*. None of his family seem to have carried on his own business, and in 1789 the Pollokshaws Printfield, reservoir, canals, rivulets and all, was brought to the hammer. The triangle it occupied has long since been broken up and turned to various uses. In the days when cotton was our rising industry a slice of it, the middle cut, seven acres of it, was bought for a cotton mill by John Monteith, of Anderston, son of old James Monteith, and Robert Dunmore, of Kelvinside, no doubt the moneyed partner. From them the 'Shaws Mill passed successively to John Monteith alone, to his brother Henry Monteith, of Carstairs, to W. & M. Hunter & Co., to J. & R. Cogan, all well-known men in their day. It now belongs to Lowndes, Macdonald & Co., manufacturers. It was in this mill that the powerloom was first used on any considerable scale. John Monteith ran 200 powerlooms there to good account. Thus the same triangle of Nether Pollok, which had given a start to our printing, gave a start to our manufacturing.

Not long before his death Provost Ingram undertook a difficult duty. On October 12, 1769, it was moved in the Merchants' House that the price of coals was lately risen to an excessive rate. The motion was carried *nem. con.*, and Provost Ingram and others were named a committee to consider and report "how the price of coals could best be lowered, and the inhabitants served with this necessary article on reasonable terms." Unfortunately the committee's report is not on record; it would be very handy just at present to know how to be served with this necessary article on reasonable terms. Yet I fear that the relief would at best be temporary. It is not easy to thwart the divine order by which supply and demand control prices—all prices, the price of coals and the price of winning coals; few provosts can do it; it is "aboon their micht;" nay, it taxes the powers of a Chisholm Robertson.

TESSERÆ.

Imitation of Greek Models.

DO we show our appreciation of the Greeks most wisely in attempting the mechanical reproduction of their forms, or by endeavouring to comprehend the thoughtful spirit of full-grown manhood in which they wrought, to kindle ourselves by the emulation of it, and to bring it to bear with all its plastic force upon our wholly new conditions of life and thought? It seems to us that the question is answered by the fact, patent in the history of all the fine arts, that every attempt at reproducing a bygone excellence by external imitation of it, or even by applying the rules which analytic criticism has formulated from the study of it, has resulted in producing the artificial and not the artistic. That most subtle of all essences in physical organisation, which eludes chemist, anatomist and microscopist, the life, is in æsthetics not less shy of the critic, and will not come forth in obedience to his most learned spells, for the very good reason that it cannot, because in all works of art it is the joint product of the artist and of the time. Faust may believe he is gazing on "the face that launched a thousand ships," but Mephistopheles knows very well that it is only shadows that he has the skill to conjure. He is not merely the spirit that ever denies, but the spirit also of discontent with the present—that material in which every man shall work who will achieve realities and not their hollow semblance. It is one of the marvels of the human mind, this sorcery which the fiend of technical education weaves about his victims, giving a phantasmal Helen to their arms and making an image of the brain seem substance. It is the grace of the Greeks, their sense of proportion, their distaste for the exaggerated—it is these that we should endeavour to assimilate without the loss of our own individuality. We should quicken our sense of form by intelligent sympathy with theirs, and not stiffen it into formalism by a servile surrender of what is genuine in us to what was genuine in them. "A pure form," says Schiller, "helps and sustains, an impure one hinders and shatters." But we should remember that the spirit of the age must enter as a modifying principle not only into ideas, but into the best manner of their expression. The old bottles will not always serve for the new wine. A principle of life is the first requirement of all art, but can only be communicated by the touch of the time and a simple faith in it; all else is circumstantial and secondary.

English Tapestry.

The introduction of tapestry-weaving into England is usually attributed to a gentleman named Sheldon, late in the reign of Henry VIII. Lady Wilton mentions indeed an intimation by Walpole of its origin as early as the time of Edward III.; but if any attempt was made to introduce the art at that time, it does not appear to have produced any important result. According to her "Art of Needlework," Sheldon allowed an artist, named Robert Hicks, to use his manor-house at Burcheston in Warwickshire for the practice of the art, and mentioned him in his will which was dated 1570, as "the only auter and beginner of tapistry and arras within this realme." At Burcheston were worked in tapestry on a large scale maps of Oxfordshire, Worcestershire, Warwickshire and Gloucestershire, some fragments of which were, it is stated, in Walpole's collection at Strawberry Hill. Little more is known of this establishment. James I. endeavoured to revive the manufacture of tapestry by encouraging and assisting in the formation of an establishment at Mortlake about 1619, under the management of Sir Francis Crane. James I. gave 2,000*l.* towards the formation of this establishment, which appears to have been originally supplied with designs from abroad, but subsequently by an artist named Francis Cleyne or Klein, a native of Rostock in the duchy of Mecklenburg, who was engaged for the purpose. This undertaking was a favourite hobby both with James and his successor, who regarded Cleyne so favourably that he bestowed upon him in 1625 an annuity of 100*l.* which he enjoyed until the civil war. In the same year Charles I. granted 2,000*l.* a year for ten years to Sir Francis Crane, in lieu of an annual payment of 1,000*l.* which he had previously covenanted to pay for that term as the grant recites, "towards the furtherance, upholding and maintenance of the worke of tapestries, latelie brought into this our kingdome by the said Sir Francis Crane, and now by him and his workmen practised and put in use at Mortlake in our countie of Surrey," and of a further sum of 6,000*l.* due to the establishment for three suits of gold tapestries. After the death of Sir Francis Crane, his brother Sir Richard sold the premises to the king, and during the civil war they were seized as royal property. After the Restoration Charles II. endeavoured to revive the manufacture and employed Verrio to make designs for it, but the attempt was unsuccessful. Lady Wilton, however, conceives that although languishing, the work was not altogether extinct, "for," she observes, "in Evelyn's very scarce tract entitled 'Mundus Muliebris,' printed in 1690, some of this manufacture is amongst the articles to be furnished by a gallant to his mistress." During its period of prosperity this manufacture produced the most superb hangings after the designs of celebrated painters, with which the palaces of Windsor Castle, Hampton Court, Whitehall, St. James's, Nonsuch, Greenwich, &c., and many of the mansions of the nobility were adorned. Five at least of the cartoons of Raphael, which appear to have been bought by Charles I. for that purpose, were worked in tapestry at Mortlake. These celebrated works were designed for the purpose of being copied in tapestry and were originally worked in Flanders. An Act of Parliament was passed in 1663 to encourage the linen and tapestry manufactures of England and to restrain the great importation of foreign linen and tapestry.

Walter Stukeley, the Archæologist.

No antiquarian ever had so lively, not to say licentious a fancy as Stukeley; the idea of the obscure remote past inflamed him like a passion; most even of his descriptions are rather visions than sober relations of what would be perceived by an ordinary eye; and never before or since were such broad continuous webs of speculation woven out of little more than moonshine. He possessed, however, a great deal of real ingenuity as well as learning, and all his works contain many things that are most curious and valuable, some of them much that would by this time have been irrecoverably lost but for his record of it, although few if any of either his theories or his histories are to be received throughout with implicit faith. His first antiquarian work was "An Account of a Roman Temple (the celebrated Arthur's Oven) and other antiquities near Graham's Dike in Scotland," 4to, London, 1720. This was followed by his "Itinerarium Curiosum, or an Account of the Antiquities and Remarkable Curiosities in Nature or Art observed in Travels through Great Britain," illustrated with copper plates, fol., 1724. A second volume, or "Centuria," as it is designated, was added to this work from the papers and drawings he left at his death ready for the press, and was given to the world, along with a reprint of the former volume, in 1776. It is of all Stukeley's works the one that is now most sought after. His next publications were his two works on the great druidical or supposed druidical remains in the West of England—the first entitled "Stonehenge and Abury, two Temples restored to the British Druids," fol., 1740; the second, "Abury, a Temple of the British Druids," fol., 1743. In 1743 also appeared his

"Palæographia Britannica," 4to. He produced nothing more except some communications to the "Archæologia" and the "Philosophical Transactions," till in 1757 he printed, in a separate tract, his account with extracts of the work of Richard of Cirencester, "De Situ Britannia," sent to him as having been recently discovered at Copenhagen, by J. C. Bertram; but a more extended account of this work is given in the second or posthumous Centuria of his "Itinerarium Curiosum," already noticed. In 1759 appeared, in a quarto volume, one of his most remarkable works, entitled "Some Account of the Medalllic History of Marcus Aurelius Valerius Carausius, Emperor of Britain."

Early German Æsthetics.

The word *æsthetik* was first used by Baumgarten, who considered beauty as a given property of objects, of which we are becoming sensible. We perceive beauty, says Baumgarten, wherever we meet with perfection manifested in reality, and a thing is perfect if it is adequate to its notion; beauty, accordingly, is the perfectness of an object manifested in its appearance. The impulse to a deeper research into the essence of beauty was given by Winckelmann, who, without embodying his views in a regular system, developed them chiefly in reviewing and appreciating the remains of ancient sculpture. He adopted neither Baumgarten's "adequateness of an object to its notion," nor the sensual principle which had been proposed by Edmund Burke as the criterion of beauty; but considered the idea of beauty as dwelling in the divine mind, and as passing over from that source into individual objects. Kant denied the possibility of a strict science of beauty, inasmuch as beauty, according to him, is not a property of objects, but has its origin in the disposition of our mental faculties. We pre-suppose, says he, that some notion is contained in the apparent object, though we are unable abstractedly to express that notion; we assume that a tendency towards some purpose has presided over the formation of the manifold variety displayed before us, though we cannot precisely define that purpose, and this supposition or assumption forms the basis of our perception of beauty. Schelling's view of beauty and art it is difficult to state concisely. His "system of transcendental idealism" establishes the principle that mind and nature, or conscious and unconscious existence, are primarily identical; that the laws discoverable in nature must accordingly be traceable to the laws of consciousness, whilst, *vice versa*, the laws of consciousness must admit of being recognised as being likewise the laws of nature; in the divine mind both exist in absolute identity. The artist is to produce in his mind an intellectual intuition analogous to this identity and the expression which he gives to the identity thus arrived at is the work of art. Beauty, according to Schelling, is that manifestation of the principle of art where the infinite appears contained in, or represented by the finite, or where, in the very object, the difference between the conscious and the unconscious (mind and nature) is annulled.

Variety in Roman Planning.

With the exception of the Erechtheum Greek temples were simple parallelograms, differing from each other as to plan only in the number and disposition of the columns around the cella. By the adoption of the circular form in their plans the Romans introduced an important element of variety into architectural design. Polygonal forms of plan were sometimes employed, of which there is an instance in what is called the Temple of Minerva Medica at Rome, which is circular on the exterior, but internally decagonal, with nine of its sides occupied by as many recesses, and the other by the doorway, a remarkable peculiarity, it being very unusual to enclose a polygon within a cylindrical structure, although not the contrary, nor to erect a cylinder upon a square or polygonal basement. Octagonal plans were by no means uncommon; such forms were frequently made use of for the saloons of public baths, and there is an instance of an octagonal temple, supposed to have been dedicated to Jupiter, in one of the courts of Diocletian's Palace at Spalato. Of hexagonal structures there is no example, but a court with six sides occurs in the remains of the Temple of Baalbec, not, however, a regular hexagon, but of elongated figure, two of the sides being 110 and the remaining four 88 feet each. In the later periods of Roman architecture, circular and polygonal structures became more frequent, and those of the first-mentioned kind deviated considerably from the original simple rotundas and circular temples. An inner peristyle of columns was introduced so as to make a spacious circular or ring-shaped ambulatory around the centre, which was much loftier than the colonnade, being covered by a dome raised upon a cylindrical wall over the columns. What is now called San Stefano Rotondo at Rome, supposed by some to have been originally a temple dedicated, first to Faunus, and afterwards to the Emperor Claudius, and by others to have been a public market, is a structure planned according to the arrangement just mentioned, with a circular Ionic colonnade of twenty columns and two piers. The church of Santa Costanza,

traditionally reported to have been a Temple of Bacchus, but now generally supposed to have been erected by Constantine as a baptistery, and afterwards converted by him into a funeral chapel to his daughter Constantina, is a remarkable example, owing to the columns being not only coupled, but unusually disposed, and to there being arches springing from their entablature—that is, there are twenty-four columns (with composite capitals) placed in pairs, on the radii of the plan, or one behind the other, forming twelve inter-columns and as many arches, and as far as the mere arrangement goes, this interior is strikingly picturesque, but it would be an improvement if the dome were in such case to spring immediately from the imposts of the arches, and the latter to groin into it, or at least were it to spring from the vertex of the arches.

The Irish Round Towers.

In external character all the Irish towers may be said to agree, since there is only one which does not taper, and in that case the tower is cylindrical throughout its entire height. It is nicely faced inside and out with coggle-stones, and filled up with rubble. Though all bear to each other the strongest family likeness, there are many striking differences in the mason-work and in the minor details. The stones in some are truly chiselled and closely and beautifully laid in fine cement. Some are only coarsely hammered, others merely faced, and of various shapes and sizes, but still well fitted to each other. Some towers are built of round coggle-stones. In all the mortar is as hard as the embedded stones. The above and various other little diversities prove that these remarkable structures were erected by various workmen and at divers times, and, as Giraldus Cambrensis says, "according to the manner of the country"; but this clearly implies that the era of their erection must have prevailed through a very long period. Their situation on hill or dale is equally variable, nor does any one circumstance respecting their situations seem to be common to all, except their immediate vicinity to a small and very ancient church, though in some instances this ancient building has been replaced by a more modern fabric. Though most of these round towers were evidently divided into storeys, yet Cashel tower is smooth, and even polished on the inside from top to bottom. That at Ardmore was plastered with a very fine white and durable cement. The divisions are usually formed by projecting ledges for the flooring joists, which, however, in some instances were inserted in square holes in the wall, where the ends were still visible not many years ago. On each floor there is one very small window, and immediately below the conical cap four windows may be traced in the greater number of towers. In one there are five and in a few six windows, and so many as eight appear in one or two of the towers, but this is the largest number hitherto observed. In three or four of these buildings no windows appear in the upper storey—only one small loop-hole—a convincing proof that they could not have been intended for campanili. In most of the towers the doors are at a considerable height above the ground, in one even 24 feet, in several 14, and in others only 8, 7, or 6 feet, but in none of them are there any traces to assist conjecture as to the mode of reaching those doors, except in those where the door is on the ground, or raised from it by a couple of steps. The height of these towers varies greatly, one being only 35 feet, while the loftiest is 120 feet, but the common range is between 80 and 100 feet. Some stand on circular bases, which form one or two deep steps round the tower. Thus Donoughmore has a two-step base, each step or plinth being composed of very large blocks of stone. The basement of Kell's tower is square and the stones are of great size. Kilree and Aghaviller, both in the county of Kilkenny, have circular plinths 14 inches deep, projecting 6 inches, and resting upon a square base formed of great blocks of stone. The tower of Clondalkin, about five miles from Dublin, stands on massive stonework, and St. Columb's tower, at Londonderry, rises from a vaulted crypt. So also does that at Oughterard, in the county of Kilkenny.

Architectural Proportion.

The only kind of proportions in regard to which positive directions can be laid down, and which are therefore prepared for all alike without other study than that included in the usual course of elementary instructions, are those which relate to columns, doors, windows, niches, &c. For all these, certain relations between height and breadth have been established, originating in convenience and fitness, and not in any abstract notions of geometrical harmony or beauty. Were the latter the case, the square and equilateral triangle would recommend themselves as the most perfect forms, the one for windows, the other for pediments. This is so far from being the case, that no kind of square apertures are admissible or capable of being rendered agreeable even where dictated by convenience, except for mezzanine windows, for if a window requires to be made of wide proportions, so as to approach a square, it must be divided into separate upright compartments or apertures, after the manner of what is called a Venetian window; other-

wise, even although its dimensions should not be such as to render a single aperture inconvenient, it would produce a disagreeable effect, and look like a mere glazed gap, or as a Gothic window of wide proportions would do without its mullions. With regard to arches, again, or rather the spaces or openings covered by them, the proportions that are pleasing in some cases are quite unsuitable for others; in spacious apertures of the kind, that is of considerable breadth as regards the other features, the proportions ought to vary little from a double square in height, or two circles inscribed within the aperture of which half of the uppermost one will be the outline of the arch, whereas in narrower apertures of the kind and in arched windows greater proportionate height is allowable. As in almost every other respect, Gothic architecture affords greater freedom and latitude, not only as regards the form of the arch itself, but also the general proportions of the entire voiding covered by it, which may be of lofty proportions in comparison with its breadth; but in the Roman or modern Greco-Roman style (where the arch is adopted together with the Grecian features and detail), other proportions than those above mentioned cannot very well be departed from, because the excess as to height which would produce the grandeur of loftiness would in the same degree occasion the effect of narrowness, narrow and lofty being almost convertible terms as regards proportion. There are cases in which propriety and fitness not only reconcile us to proportions that would else be positively disagreeable, but in which positive admiration is excited by what would in general be termed utter disproportion. Of this we have proof in bridges, where beauty and grandeur are occasioned by proportions that would be absolutely monstrous elsewhere, by arches of prodigious span or width, springing from exceedingly low piers.

The German Canaletto.

An example of the power of heredity is shown by the history of the Quaglio family. How long they have been connected with the arts in Italy is unknown. One member belonged to the school of Tintoretto, and was appreciated as a painter of altar-pieces in Austria. His son Julio was a frescoist. Giovanni Quaglio was engineer and architect in the Imperial service at Vienna. His son Lorenzo designed many buildings in Germany. A son of the latter was an architectural and scene painter. Another of Giovanni's sons, named Domenico, was a historical painter. He left two sons, Julius, an admirable scene painter at Munich (died 1800), and an elder son, Joseph (died 1828), who was even more eminent than his brother, both as a scene painter and in decoration generally. Joseph had four sons, Angelo, Domenico, Lorenzo and Simon. Angelo was also a scene painter of extraordinary genius, and some of his productions are described as having had a most astonishing effect, particularly one representing the illumination of St. Peter's at Rome, after studies made by him on the spot. Domenico, who was called the German Canaletto, was born at Munich in 1786, and began at a very early age to manifest a fondness for art, especially for perspective and architectural painting. With his father for his instructor, and with his own instinctive feeling to urge him on, he not only made rapid proficiency in the above-mentioned studies, but devoted his leisure to drawing from the life model, to landscape and sketches from nature, and to etching and engraving. In fact, he was in some danger of aiming at excellence in too many departments of art, had he not, by the advice of his brother Angelo, determined to devote himself more especially to one. Having imbibed a strong taste for the architecture of the Middle Ages from Angelo's own drawings of the cathedral of Cologne (made for Sulpice Boisserée's splendid work), he resolved to make the buildings of that period the chief subjects of his pencil. With this view he made an architectural tour to Freising and other places, studying their interesting monuments of Gothic architecture. These furnished him with a stock of subjects for paintings on his return, and among the rest for his picture of Regensburg Cathedral, which was purchased by Maximilian, the King of Bavaria, who exhorted the artist to confine himself to the new branch which he had so successfully commenced. Following this advice, which was seconded by that of many other able judges, Quaglio resigned, in 1819, his situation and salary as scene painter at Munich theatre, and thenceforth applied himself solely to architectural painting, in which branch of art he gradually established a reputation throughout Europe, and at the same time was not a little instrumental in promoting by his works that taste for the architecture and arts of the Middle Ages which has of late years taken root in Germany. Independently of their value as portraits of some of the finest productions of German-Gothic architecture, his works are marked by striking picturesque effect. Besides his pictures, which are very numerous, he executed many etchings and lithographic views, and among the latter a series of thirty subjects, entitled "Denkwürdige Gebäude des Deutschen Mittelalters." In 1829 he accompanied Mr. Gally Knight in a tour to Italy as his architectural draughtsman. He died at Hohenschwangau (where he was employed in restoring and improving the castle), of an apopleptic attack, April 9, 1837.

NOTES AND COMMENTS.

A SCHEME of improvement for the slums of the Fountainbridge district, Edinburgh, prepared by the burgh engineer, is now under the consideration of the Town Council. It is proposed to widen several of the streets. The cost of the whole scheme cannot well be estimated at present, but the more important works comprising the removal of the canal and formation of new basins and wharves and loading bank; the utilisation of its site for streets and building plots; the widening of Fountainbridge; the formation of extended and widened Semple Street; the formation of a new street at Port Hamilton from Morrison Street to Fountainbridge; the connection of Gilmore Place and Fountainbridge—including the paving and drainage of such new streets—is estimated to cost 301,008*l*. On the other hand, sites for buildings and workshop yards worth 158,228*l*. would be available without delay, thus leaving the net cost as 142,780*l*. The majority of visitors to Edinburgh are not well acquainted with Fountainbridge, and it could not be recommended to invalids. The long narrow thoroughfare leads to slaughter-houses, manufactories and other places where disagreeable operations are carried on. In all large cities drawbacks of the kind are inevitable, but in Edinburgh they contrast painfully with the general character of the city.

THE competition for the "Owen Jones" Prize has been decided. The prize was instituted in 1878 by the Council of the Society of Arts, as trustees of the sum of 400*l*., presented to them by the Owen Jones Memorial Committee, being the balance of subscriptions to that fund, upon condition of their expending the interest in prizes to "students of the School of Art who, in actual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by OWEN JONES." The prizes are awarded on the results of the annual competition of the Science and Art Department. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of OWEN JONES'S "Principles of Design," and a bronze medal. The following is a list of the successful candidates:—FRED. APPELYARD, School of Art, Scarborough—Design for wall-paper; ERNEST G. GILICK, School of Art, Nottingham—Design for lace curtain; ERNEST G. SLATER, School of Art, Scarborough—Design for a damask; CONSTANCE T. SMITH, School of Art, Glasgow—Design for a printed velvet; EDWIN FRANCIS, School of Art, Durham—Design for a carpet; SAMUEL PALMER, School of Art, Macclesfield—Design for floor tiles. The next award will be made in 1895, when six prizes will be offered for competition.

THE account of his experiences in Ireland which the late W. R. LEFANU published was so mirthful, we are sure every reader desired that the author would benefit the world by relating more of the same sort. Unless he completed a second collection that desire is vain, for Mr. LEFANU has joined the men whose foibles he described. Many an amusing story could have been told at his own expense, but this is not the time. Mr. LEFANU was a pupil of the late Sir JOHN MACNEILL, a civil engineer who held a monopoly of railway work in Ireland. It was his fate to be dethroned by his pupils. LEFANU acquired the work in the south, HEMANS in the west, BARTON in the north, the eastern part was shared between the three. His college professorship was also practically withdrawn from him. Mr. LEFANU became chief engineer to the Great Southern and Western Company. Mr. HEMANS obtained a similar position with the Midland Great Western Company. Each of the companies possessed a merchant for chairman, and one regarded the other as an enemy. Almost every year there was a duel between them in Parliamentary committee-rooms. Between the two main lines of railway there was a large tract of country, and the endeavour was to get possession of part of it. There could be no better arrangement for the advantage of the engineers, although the contests were not profitable to the shareholders. After a time the chairman died; his successors were not belligerent, and applied the *Cui bono?* test to Parliamentary warfare. Mr. LEFANU, finding his occupa-

tion gone, accepted a commissionership of public works, to the amazement of all engineers, for that office was reserved for broken-down military men, surveyors, road-makers, valuers, with an occasional briefless barrister. However, there was one advantage for a gentleman like Mr. LEFANU, the office afforded leisure for fishing. Nor was he left to repose. The edict by which men of the age of sixty-five were supposed to be incapable to enjoy official posts that were originally intended as a solace for old age was applied to Mr. LEFANU, and he was forced to retire from as pleasant a position as is to be found in the Civil Service of any country, and one, too, which afforded abundant materials for a story-teller. He utilised his leisure for the preparation of his admirable book, and it is to be regretted that a writer so competent did not live long enough to exhibit his humour repeatedly. In these dull days his gift was as beneficial as the Samaritan's oil.

IT is sometimes said that if a young architect assaulted a contractor who was faithfully adhering to the specification he would be likely to become a success, but on condition that he was summoned and fined. The next best course would be to assault obnoxious materials and take the chance of a prosecution. For it is not legal to destroy another man's property, and materials which are unsuitable in one place can be turned to account elsewhere. The architect's business is simply to reject materials when he cannot approve of them. A case relating to the subject is now before the New York courts. According to the *American Architect*, Mr. WALTER PARFITT, architect, who has been building a church in Brooklyn, found some stones used in the church which, as he testifies, had already been rejected and condemned, as unfit for use. He made sure of his directions being followed for the future in regard to them by getting a hammer and smashing them. The contractor sued the architect for destroying his property, and a commission allowed him some 1,400 dols. The present suit is brought to have this award set aside, the architect claiming that the stones were destroyed by him in pursuance of his duty in defending the structure against danger, and after due warning to the contractor. The judge left the case for consideration, so that we do not yet know the result; but as the points involved relate to the extent of an architect's powers in compelling compliance by contractors to his directions, the judgment will be looked for with interest. There is a story, whether authentic or not we cannot say, which relates that an owner found that a wall in his new house was being built with bond-courses only every ninth course in height instead of every seventh course, as required by the contract, and knocked it over with a piece of heavy timber, and was sustained by a court in doing so; and if it is lawful for an owner to destroy without warning a wall which is a little less perfectly bonded than the contract requires, it must be still more lawful for him to destroy after due warning stones which constantly menace the whole structure; and if an owner could do so there is certainly ground for claiming that his architect, who is unquestionably his agent for averting obvious peril to his building, not only could but should take in emergency such measures as the case seemed to him to require. Whether the New York court will hold this view remains to be seen, but New York courts have, particularly as compared with those of some of the agricultural States, a very good understanding of the relations of architects to owners and contractors.

A FRENCH painter, M. RICHARD PARAIRE, has returned to Paris after spending a year on the Ivory Coast. He made several explorations, and has brought back a multitude of drawings and sketches. M. PARAIRE is to hold an exhibition of his works in the course of the winter, and, as his countrymen have of late years become interested in Africa, it is likely to be successful. About its novelty there can be no question.

IT is said that an English company contemplate the construction of a hippodrome in Paris. In size it will be as large as the old one, which was recently abandoned. It will have an advantage over its predecessor, as it will be erected in the centre of Paris, and not far from the Opera House.

A street corner in Wokingham.

Chas. Steward Smith. Del.
Jan. 1894.

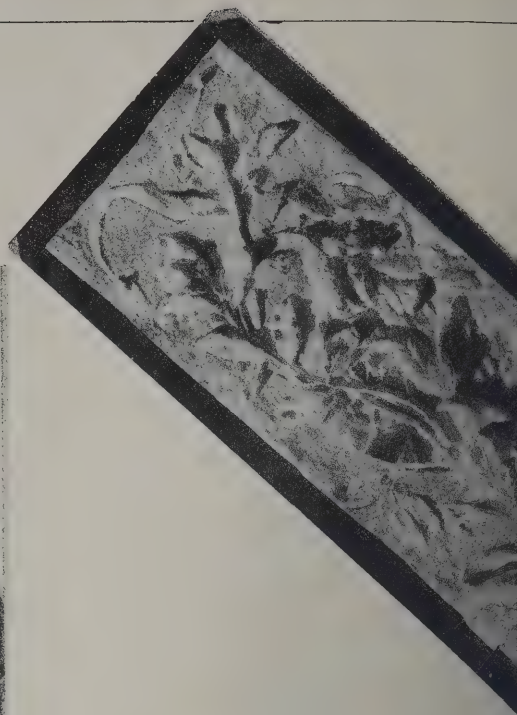








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PAINED AND SCULPTURED DECORATION.
By T. G. CESARE FORMILLI.

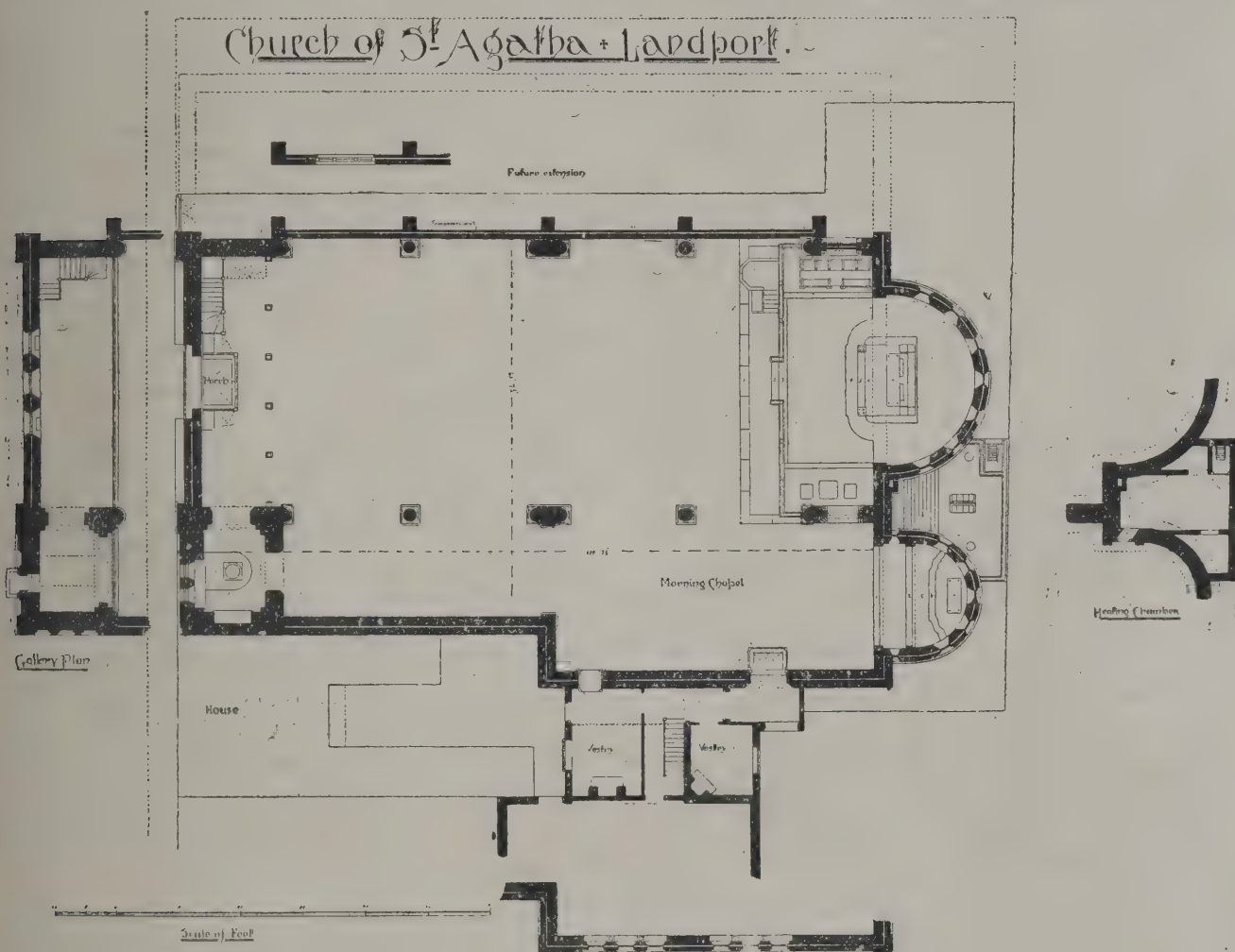
ILLUSTRATIONS.

CHURCH OF ST. AGATHA, FOR THE WINCHESTER COLLEGE MISSION, PORTSMOUTH.

THE drawing which we reproduce in this issue was exhibited in the Royal Academy Exhibition of the current year. The church is in course of erection in a very poor part of Portsmouth, where the Rev. R. R. DOLLING, missionary, has worked for some years. The style adopted is that of the Basilican churches of the Lombard type, which secures uninterrupted view of the altar to a large congregation. The church when completed will seat some 1,250 people. It is proposed at present to complete the nave and south aisle, which will seat about 800, at a cost for the structure of 6,200*l.*, but contracts have been obtained for its completion with all fittings and finishings. The south aisle is arranged as a complete chapel large

JOHN FLAXMAN.

THE father of Flaxman was a modeller and dealer in plaster figures. At the age of fifteen the son became a pupil at the Royal Academy, after having sketched many designs of much merit. While yet a boy, he had the advantage of receiving the kindly aid of many accomplished women of that time, among whom were Mrs. Matthew, Mrs. Chapone, Mrs. Montagu and Mrs. Barbauld. But before he attended as a pupil at the Academy, he had sketched a number of subjects from Homer and other classical writers, which he had heard read at Mrs. Matthew's house; among these were six executed in black chalk:—The Blind *Cædipus* conducted by Antigone to the Temple of the Furies; *Diomedes* and *Ulysses* seizing *Dolon*; the Lamentation of the Trojans over the Body of *Hector*; Alexander taking the Cup from Philip, his Physician; *Alcestis* taking leave of her Children; and *Hercules* releasing *Alcestis*. His first model, in wax, was produced at the Royal Academy in 1770, and from that period he studied and worked fifty-seven years as a sculptor. During the years which passed while and soon after Flaxman studied at the Academy, he was more



enough for daily services. The architect is Mr. J. HENRY BALL, A.R.I.B.A., of London and Southsea, and the contractors Messrs. W. R. LIGHT & SON, of Portsmouth.

STREET CORNER IN WOKINGHAM.

THE double-page illustration given this week is a reproduction of a sketch exhibited at the Royal Academy this year by Messrs. CHARLES SMITH & SON, architects, Reading.

The building was erected some time since at Wokingham, Berks, and is constructed with local grey brick facings and red brick dressings and strings. The stonework is of Box ground Bath. Messrs. SPEAR & KING, of Crowthorne, Berks, were the builders employed to carry out the work.

PAINTED AND SCULPTURED DECORATION.

Mr. L. Collmann, the inspector of furniture at Windsor Castle, has prepared a guide to the building and collections.

noted for his sketches than his models; and he was regarded rather as one who would some day rise to eminence than as one already great. The pecuniary resources of himself and his father were but small, and he found it desirable to accept an offer from the liberal and enlightened Wedgwood, to prepare designs and models for the porcelain which that energetic manufacturer was then bringing into vogue. Flaxman gave to those designs a grace, beauty and classical simplicity which had never before been exhibited in such works in England; and at a much later period, when at the zenith of his fame, he alluded with just pride to those productions of his earlier years. In this kind of employment, and in making sketches and models for employers once now and then, he maintained himself from his twentieth to his twenty-seventh year, employing his evenings in sketching designs (which seems to have been his great delight) from the Bible, "Pilgrim's Progress," Homer, and poets of various countries and ages. During this period he exhibited at the Royal Academy models of Pompey after his defeat of Pharsalia; Agrippina after the death of Germanicus; Hercules with Dejanira's poisoned Shirt; Acis and Galatea; and the Death of Julius Cæsar.

Flaxman went to Rome to study in 1787, being then thirty years of age. He had been partly impelled to this step by a cold and much-criticised remark of Sir Joshua Reynolds

who, hearing that Flaxman had married, said, "Then you are ruined for an artist." Flaxman, who had married a lady in every respect worthy of him, determined to falsify Reynolds's prediction by studying until he had reached a lofty position in art. During the intervening period, before his departure from England, he produced a few works in sculpture. One of these was a monument of Collins the poet for Chichester Cathedral; a second was the monument to Mrs. Morley, in Gloucester Cathedral; another was a monument to the memory of Miss Cromwell. All these exhibited a strongly religious feeling in the conception and treatment of the subjects; and it was one of the guiding principles of Flaxman, often acted on in after-life, that "the Christian religion presents personages and subjects no less favourable to painting and sculpture than the ancient classics." When he was at Rome he saw how vividly the devotional spirit of the Church had drawn out the talents of the Italian artists in productions suitable to the tenets of that Church; and he conceived the opinion that the Protestant doctrines, if treated with taste and discrimination, were no less susceptible of engendering fine works of art.

While at Rome Flaxman divided his time between the pursuit of such studies as should qualify him for the lofty position which his genius marked out for him, and in such works as should in the meantime support him. It was while at Rome that he produced the series of designs which have made his name known throughout Europe, more even than his works in actual sculpture. These designs were from the writings of Homer, Æschylus and Dante, for three English employers—all conceived in a spirit which fitted them to be embodied in marble, though such an embodiment has not yet been accomplished. From the "Iliad" there are thirty-nine illustrations, of which twenty-seven are so chosen as to contain female figures as a means of softening the stern character of other parts of the poem. Mr. Allan Cunningham, in his "Life of Flaxman," describes many of these, and says generally of Flaxman's mode of treating them, "His taste was with the beautiful as well as with the stern—and it was thus he sought to soften down and relieve the scenes of carnage and peril with which the fiery epic abounds. He has varied his illustrations with great skill, and displayed everywhere a fine sense of the harmony of composition. All is grave, severe, simple; he has admitted nothing that is mean or merely ornamental; the beauty of form is subordinate to the sentiment; his heroes have no taint of brutality, nor his beauties of levity." Another set of designs were from Homer's "Odyssey," thirty-four in number, not less masterly in composition than the former. The third series consisted of illustrations of Dante, comprising no fewer than a hundred and nine sketches from the "Divina Commedia" of that poet. The three parts of that extraordinary poem relate respectively to Purgatory, Hell and Paradise; and Flaxman made his designs in about equal numbers from these three sections. These drawings are wonderful productions. The critic lately quoted said concerning them:—"In the illustrations of Homer, Flaxman was guided by ancient works of art as well as by the poet's verse; but the subject now presented to his fancy wanted wholly the former species of emblazonment; its images were as yet unembodied in marble, and the antique character of face would have been manifestly out of keeping with modern princes and poets and warriors. I cannot help, therefore, regarding his Dante as a more original work in every way than his Homer; that it is, on the whole, less popular may be ascribed to the difference of fame in the poems themselves, for all who are intimately acquainted with the subjects will feel that he has come nearer to the illustrious Italian than to the unrivalled Greek."

It frequently happens that the works which bring most fame to an artist after his decease are those for which he is most humbly paid while living, and, as an illustration of this, it may be said that Flaxman received less than a guinea apiece on an average for these original and beautiful sketches. They, however, immediately brought him into note, and he executed various commissions during the seven years spent at Rome. He produced for Mr. Hope a small marble group of *Cephalus and Aurora*. For the Earl of Bristol he sculptured a group from Ovid's "Metamorphoses," relating to the Fury of Athamas, comprising four figures larger than life. From this commission he is supposed to have actually lost money by the insufficient price paid for it.

On his return to England, Flaxman found Banks, Bacon and Nollekens in full and profitable employment. While yet at Rome he had been commissioned to sculpture a monument to Lord Mansfield, now in Westminster Abbey, and this was one of the first works which he completed and exhibited on his return. Soon after this he presented to Mrs. Flaxman, on her birthday, a book full of exquisite original sketches by his own hand, comprising forty designs illustrative of the Christian virtues and their antagonist vices, forming a kind of allegory something like "The Pilgrim's Progress." Mr. Allan Cunningham describes these designs at full, and then says, "To publish an engraved facsimile of this book would be conferring a benefit on mankind."

In 1797 he was elected a Royal Academician, and in the same year exhibited three sketches in bas-relief from the New Testament, comprising the subjects of Christ raising the daughter of Jairus, an embodiment of the words "Comfort and help the weak-hearted," and another, "Feeding the hungry." After producing a bas-relief monument to Sir William Jones and one or two other works, he made a proposal to Government when a grand national pillar was talked about, to make a statue of Britannia 200 feet in height, but the magnificence of the scheme did not meet with a response. This rejection even did not prevent him from being employed in a rapid succession of works. One of these was a monument to the family of Sir Francis Baring, in which the two Christian texts of "Thy Kingdom come" and "Deliver us from evil" are embodied with a loftiness and devotion of feeling which few sculptors seem to have had equal to Flaxman. It was his custom in funeral monuments to embody texts from Scripture in this way. One on a monument to Miss Lushington illustrated the passage "Blessed are they that mourn." Other instances related to "Come, thou blessed," "Lead us not into temptation," and "Faith, Hope and Charity."

In the remaining years of his career he executed many public monuments and statues, such as that to Lord Howe, a statue of Sir Joshua Reynolds, another of Sir John Moore for Glasgow, another of William Pitt for the same city, and others of Joseph Warton, George Stevens, the Rajah of Tanjore, the Missionary Schwartz, Lord Cornwallis, Warren Hastings and the Marquis of Hastings. In the midst of all these labours he pursued what seems to have been the chief delight to him in the domain of art, viz. the embodiment of stories from poets and classical writers, and light sketches fitted for being wrought into bas-relief, but left by Flaxman simply in the state of drawings. We have already named the "Iliad," the "Odyssey" and the Dante series, comprising altogether about two hundred designs, and to these may be added forty designs from "Oberon," thirty-six from Hesiod, others from "The Pilgrim's Progress" and others again from Æschylus; so that there were three ancient poets, Homer, Hesiod and Æschylus, and three modern poets, Dante, Bunyan and Wieland, whose works have been graced by the pencil of Flaxman, besides very numerous passages from the Bible.

Among his principal works in sculpture was a group of the Archangel Michael vanquishing Satan, a fine specimen of expression and grandeur. Another was a figure of Psyche, another Apollo, others statues of Raphael and Michel Angelo.

One of his most original productions, perhaps, was the Shield of Achilles, made for the eminent goldsmiths Messrs. Rundell & Bridge. The application of art to poetry, in respect to this celebrated shield, is highly curious. Achilles, as is pretty well known, is one of the chief heroes of Homer's "Iliad," one of those semi-divine, semi-human personages, whom it is difficult to identify historically with any definite era. In one part of the "Iliad," Homer describes the shield belonging to Achilles; and the description is so wonderfully minute that it is difficult to shake off the idea that a real shield was before him when he wrote; but from the whole circumstances of the case, it seems more likely that he owed to his rich imagination the creation of this work of art. As no pictures or sculptures relating to this shield were left by the ancients, modern artists have no means of forming a conception of it but from Homer's description. Quatremère de Quincy, Pope and Boivin have all sketched a shield, such as they believe would correspond with the minute description given by Homer.

When Flaxman entered upon his task, he examined all that had been done by others, and then formed his own conception of the best mode of embodying the description of the great poet. The result was the production of a magnificent work of art, about 3 feet in diameter; the convexity of the shield is about 6 inches; the number of figures introduced is upward of a hundred, and the degree of relief varies from the smallest visible swell to about half an inch. When the drawing and model were completed, Flaxman received from the enterprising goldsmiths about 600 guineas for his labour. Four copies of this shield, in silver-gilt, valued at 2,000 guineas each, were made for George IV., the Duke of York, the Duke of Northumberland and the Earl of Lonsdale; two casts in bronze were made for the proprietors themselves, and a few casts in plaster were prepared for other parties.

Cunningham sums up Flaxman's talents as a sculptor by saying:—"Of his works there are four kinds—the religious, the poetic, the classic and the historical. In each of these he has left specimens which give him high rank amongst the sons of genius, but in all of them he has not attained the same degree of excellence. In the historical he was embarrassed with the unpoetic costume of these days of buttons and capes; in the classic he was compelled to obey the antique; but in the poetic and the religious he has been surpassed in purity and simplicity by no modern sculptor." The historical series comprise a considerable number of works, but, from the reasons before stated, he did not particularly excel in them. "Generals, with their tassels, tags, orders and epaulettes; aldermen, with their

confirmed gout, corporation buttons and civic wigs; bishops, with their lawn-sleeves, and ladies, with their puckered gowns, spangles and trinkets, suited ill with the poetic Flaxman."

ARCHÆOLOGICAL EXCURSION.

THE members of the Upper Norwood Athenæum have just made their eighth excursion of the eighteenth summer season, when, under the guidance of Mr. W. F. Potter, architect, they proceeded by the South Eastern Railway to Abbey Wood, where, by kind permission of Mr. H. Pease, the scanty remains of Lesness Abbey and the spacious Tithe Barn were visited. The Barn, which is occasionally associated with the name of Wolsey, is quoted by Mr. John Harris as being coeval with the monastery. Its length is 150 feet and its breadth 40 feet; a little wider, but considerably shorter than the splendid specimen still standing at Harmondsworth. Although in 1662 Sir William Boreman is credited with having removed six hundred elms and chestnuts from Lesness to replant in Greenwich Park, the woods still form a picturesque background to the Abbey Farm. From Lesness a walk was taken to Erith Church, where the altar tombs, the brasses to a servitor of the abbey and others, and the mural monument by Chantrey were examined; and then after climbing the hill a pleasant half-hour was spent among the weather-beaten mariners in Belvedere House, where in the mess-room one may still admire the inserted wall-paintings by Angelica Kauffmann. At the Belvedere Hotel, after tea, Mr. Potter read the following interesting paper, which was acknowledged in complimentary speeches by Mr. Wheeler, Mr. Hayward, Mr. Findlay and Mr. Pound, who had previously alluded in tender terms to the death of Mr. Jones, the senior vice-president.

Erith and Lesness Abbey.

Erith, Ærrehythe, is the Anglo-Saxon for Old Haven; this at once denotes the great antiquity of the place. It is situated in a gentle bend of the river Thames, which along here for some considerable distance was embanked up on both sides by the Romans. In it Celt, Roman, Saxon and Norman have, says Mr. John Harris, left traces of occupation—the Celts in their earthworks and probable riparian village. The church was restored in 1877, when part of the south-west wall had become ruinous, exposing the centre or core. It was found to be constructed with rubble embedded in mortar containing pounded tiles, which the late Mr. C. Roach Smith asserted to be Roman. Fragments of Roman tile had been found in the south wall of the church. All this would indicate the existence of a former building. Hasted says Erith in the time of the Saxons was possessed by Azor de Lessneis.

Lambard, the old Kentish historian, thus writes:—"A rich man, anno 970, being owner of Cray, Erith, Ainesford and Woldham, and having none issue of his body, devised the same lands (by his last will, made in the presence of Dunstane and others) to a kinswoman of his owne for life, the remainder of the one halfe thereof, after her death to Christe's Church, at Canterbury, and of the other halfe to Saint Andrewes, of Rochester, for ever: he died, and his wife took one Leofsun to husband, who outliving her retained the land as his own, notwithstanding that by the forme of the devise his interest was determined by the death of his wife; hereupon complaint came to one Wulsie, for that time the Scyremen, or Judge of the countie, before whom bothe Dunstane, the Archbishop, the parties themselves, sundrie other bishops, and a great multitude of the lay people appeared, all by appointment at Earith, and there in the presence of the whole assembly Dunstane, taking a cross in his hand, made a corporal oath upon the booke of the Ecclesiastical Laws, unto the Shyreman (which then tooke it) to the King's use, because Leofsun himself refused to receive it), and affirmed that the rights of these lands was to Christe's Church and to Saint Andrews. For ratification and credit of his oathe a thousand other persons, chosen out of East and West Kent, Eastsex, Middlesex and Sussex took their oathes also upon the crosse after him. And thus by this manner of judgment Christe's Church and Saint Andrews were brought into possession and Leofsun utterly rejected for ever."

William the Conqueror gave Lesness, among other great possessions in this county, to his half-brother Odo, Bishop of Bayeux and Earl of Kent, under the general title of whose lands it is entered in Domesday Book:—"Robert Latin holds of the Bishop (of Baieux) Lesness. The arable land is 17 carucates. In demesne there is one, and 60 villeins, with three borderers, having 15 carucates. There are two servants and three cottages, and three fisheries of four sulings and 30 acres of meadow: wood for the pannage of 20 hogs. In the time of King Edward the Confessor it was worth 20*l.*; when the bishop received it 18*l.*, and now 22*l.*, and yet he who holds it pays 30*l.* This manor was taxed in the time of King Edward the Confessor at ten sulings and now at four sulings. Azor held it."

Upon the disgrace of the Bishop of Bayeux, the king, his brother, seized all his lands, by which means the fee of this manor again became vested in the Crown.

Richard de Lucy, Chief Justice of England, possessed the manor of Erith in the reign of King Henry II. He founded in 1178 an abbey of Canons Regular of the order of St. Augustine at Westwood (now called Abbey Wood) in his village of Lesness.

From the Lucys, the manor of Erith descended to the Earls of Athol. John, Earl of Athol, in the reign of Edward I. being concerned in the death of John Cummin (or Comyn), and the crowning of Robert Bruce, King of Scotland, and being taken in England, he was by Edward I., who was much enraged at that transaction, sentenced to death, November 7, 1305, but in respect of his descent from royal blood, he was not drawn as traitors usually are, but was set on horseback and hanged on a gibbet 50 feet high; his head was fixed on London Bridge and his body burnt. Upon which this manor came into the hands of the Crown, and was given by the king that same year to Margaret, Queen of England.

The manor next passed into possession of the family of Mortimer. Roger Mortimer was executed (for complicity in the murder of King Edward II.) at a place called the Elms, near Smithfield. Edward Mortimer, Earl of March, married Philippa, daughter and heiress of Lionel, Duke of Clarence, third son of King Edward III., from which circumstance his descendants afterwards claimed the Crown.

He died seized of the manor of Erith, with its appurtenances, together with the passage over the river Thames there. Edmund Mortimer, the last Earl of March, of this family, was kept by King Henry IV. in close custody, owing to his having a prior claim to the Crown. Richard Plantagenet, Duke of York, in the third year of Henry VI., on the death of his cousin Edmund Mortimer, the last Earl of March, and without issue, was found to be his heir, and as such became entitled to the "manor of Erythe."

He became the leader of the Yorkist or White Rose party, and gained many advantages in the Wars of the Roses, but was eventually slain in the battle of Wakefield. His head was cut off and fixed on the gates at York, and by order of Queen Margaret of Anjou, a paper crown was placed upon it in derision of his claim to the Crown of England.

His eldest son Edward, however, triumphed at the battle of Barnet, and was crowned King Edward IV.; he was possessed of the manor of Erith, which remained part of the royal revenue till the thirty-sixth year of King Henry VIII., who granted it to Elizabeth, Countess of Shrewsbury, by the description of "the manor of Erith, *alias* Lysnes"; her monument is the principal one in the church. In the fourth year of Queen Elizabeth this countess levied a fine on this manor with the passage over the Thames, and died 1567. The manor next passed into possession of the Lords Compton and other families till 1734, when it passed into that of the Wheatley family, whose memorials may be seen in the lady chapel, now called the Wheatley Chantry.

Henry VIII. granted among other lands "to Thomas Arderne, of Feversham in Kent, all those marshes belonging to the manor of Lyesnes, in the parishes of Lyesnes, Erith, Bexley, Plumstead, Dartford and Crayford."

Early in the reign of Henry VIII. Erith sprang into temporary naval importance as a dockyard, and it has sometimes been said that the great ship *Harry Grace de Dieu* was built here in 1515; this is now disproved by a document relating to the building of the ship, preserved at the Record Office. She was built at Woolwich, 1515, and victualled at Erith.

Erith Church.

In the sixteenth volume of the Transactions of the Kent Archæological Society are two excellent papers on this church; one is written by Mr. F. C. J. Spurrell, and the other by Mr. John Harris, both of Belvedere. Mr. Spurrell says:—"There was a church in Erith in Edward the Confessor's day; it is mentioned in a deed of that king, and also in another of William the Conqueror, but it is not mentioned in Domesday, and it is not mentioned in documents again until Stephen's reign. In this interval the church was doubtless destroyed, and rebuilt at the end of the eleventh or beginning of the twelfth century. This is in accord with the Norman architecture of the chancel. The tower was built in the fourteenth century. There was evidence all over the church of three, or four, or five coats of painting. A rude picture of the Crucifixion in outline was on the eastern pier of the arch on the north side of the chancel; and another like it under the opening into the rood-screen in the church. What remained of the painted glass was utterly destroyed by the gunpowder explosion on October 1, 1864, with much else. Some of the corbel heads are grotesque, but two are not—a queen and an angel. One grotesque is very remarkable; its date is Early English. It represents, projecting into the church, a terrible wolf-like gaping head, with mouth held distended by delicately shaped human arms and hands. The teeth are regular and human, the hair

is strongly waved, and evidently of feminine length. Mr. Spurrell adds:—"Altogether it represents what I understand to be the united characteristics of the northern deities, Heta and Fenis." A stone coffin of Transition or Early English date, and possibly earlier, is now in the lady chapel. On the lid is a cross with plain trefoiled ends. It very likely came from Lesness Abbey.

It was used to form part of the steps which once led down to the church in the south entrance, and very likely was used in repair in the time of Weever, the author of the "Funeral Monuments," who was rector of this church, and probably he secured some of the materials from Lesness Abbey (the founder's vault, &c.) in 1680, at which operation he was "not the hindmost," as he says himself. Another piece of a coffin-lid, containing a floriated cross of the fourteenth century, lies with it. Mr. Spurrell's paper has three illustrations, one showing the north wall of chancel before the new addition was built to it in 1877.

Mr. John Harris's paper is a description of the monumental inscriptions in the church and other objects. Not the least interesting of these are the masons' marks on the jamb of the south door. The old sundial on the exterior of the south wall has two scrolls. One states that the dial was given in 1648 by Nicholas Stone. The other scroll bears an inscription, "Redibo, tu nunquam," filled in by the late vicar, Archdeacon C. J. Smith, who translated it, "I shall come back; thou never." Weever, in his "Funeral Monuments," records many brasses and inscriptions once existing here.

The oldest brass formerly in Erith Church is a small strip with black letter inscription in Norman French, now in the possession of Mr. Spurrell; it runs thus:—" + Felice atte Cok gist icy—Dieu de sa alme eit merci" (Felice atte Cok lies here—God have mercy on her soul). Dr. Thorpe, in his "Monumental Records of Kent," published 1769, gives an inscription of a later date. Mr. John Harris describes all those in the lady chapel, now called the Wheatley Chantry. Here is also the monument to Elizabeth, Countess of Shrewsbury, already alluded to, and it is by far the finest in the church.

The early parish registers were almost all destroyed by fire on February 21, 1877, in the temporary wooden church used during the restoration of the parish church. Fortunately, in the autumn of 1876 copious extracts had been taken for genealogical purposes by Mr. Robert Hovenden, of Croydon, and his friend, Dr. Howard. The baptismal extracts ranged from 1625.

The church is 85 feet long by 70 feet broad, and is dedicated to St. John the Baptist. The chancel, 33 feet by 16 feet, is the oldest part of the building. A new north aisle, 50 feet by 21 feet, was added in 1877, when the old vestry was removed for this. A new porch was built at the south door; the tower, 14 feet square inside and 40 feet high, was almost entirely rebuilt, and a peal of eight bells was completed by the addition of two to the older six. In the church is a flagon, 13½ inches high, inscribed, "The gift of John Wheatley, Esq., to the parish of Erith, in the county of Kent; Easter 1737."

By virtue of a commission of inquiry into the value of church livings, dated March 29, 1650, issuing out of the Court of Chancery, it was returned that "Earith was a parsonage which was an impropriation belonging to Sir Thomas Thynne, Knt., and that there was in the parish a vicarage presentative with cure of souls, and was worth 50*l.* per annum with the glebe land, which was worth 1*0**l.* of the said 50*l.*"

John Weever, the author of the "Funeral Monuments," was possessed of this rectory at the latter end of the reign of Queen Elizabeth.

Archdeacon Charles John Smith, in his charming "History of Erith," published in 1873, says, "The old elm of the churchyard is 22 feet in girth, and the ivy here was 4 feet 9 inches in circumference at its stem."

Lesness Abbey.

This abbey as already stated was founded in 1178 by Richard de Lucy, Lord Chief Justice of England in the reign of Henry II., and during the king's absence in France, Regent of the kingdom. He sided with the king in his quarrel with Archbishop Thomas à Becket, and drew down upon himself a sentence of excommunication from that offended prelate. He died July 14, 1179, and was buried "under a sumptuous monument in the choir of his church here" (in the abbey), according to Hasted. Godfrey de Lucy, a near relative of the founder and Bishop of Winchester (1189), was a great benefactor to this house. It was ultimately suppressed by King Henry VIII., who on February 8 in the seventeenth year of his reign, granted the several suppressed monasteries of Lesness, Tunbridge, Begham (now called Bayham) and Calcote, together with all their manors, lands and possessions whatsoever to Cardinal Wolsey. Four years afterwards all these estates were forfeited to the king. In 1533 he granted to William Brereton all that precinct of the late Abbey of St. Thomas the Martyr of Liesnes, but he being executed in 1542 for engaging in the fatal transaction of Queen Catharine

Howard, the estates again reverted to the Crown. Henry next granted them to Sir Ralph Sadler. They subsequently passed to Sir John Leman, who sold them to Sir John Hippisley, in whose time some workmen digging by his order for stones in the place where the church of this abbey formerly stood, then overgrown with trees and bushes, found several stone coffins and a handsome funeral monument on which, says Hasted, was the full proportion of a man cut in free stone, his sword hanging at his side in a broad belt, upon which the *fleur de lis* or *luce* was engraved in many places, perhaps a device or rebus for the name of Lucy. This figure lay on a flat marble stone which served as a cover or lid to a hollowed tomb of white, smooth, hewn ashlar stone, in which, wrapped in a sheet of lead, lay the remains of an ashy dry body, whole and uninjured, having upon its head something like hair. There can be little doubt that the monument here spoken of by Hasted and quoted from Weever was that of Richard de Lucy, the founder of Lesness. This discovery occurred in 1630. Sir John Hippisley sold the estates to Sir Thomas Gainsford, of Crowhurst in Surrey, who in the reign of Charles I. sold them to Mr. Hows, of London, and he dying without issue, settled them by his last will for ever on the hospital of St. Bartholomew, Smithfield, London, in whose possession they now remain. Archdeacon Smith gives a quaint translation of Richard de Lucy's epitaph as follows:—

Richard de Lucy's light is snatched to shade,
To justice, peace and state his court was paid;
Christ with Thy saints and Thee, his rest he made,
July twice seventh on the world did shine:
The year eleven hundred seventy-nine.

An interesting account of Lesness Abbey, by Dr. Stukeley, was read before the Society of Antiquaries, April 12, 1753, and is published in the first volume of the "Archæologia," with an illustration of the north wall of the abbey church, which, though in ruins, was perfect enough at that time to indicate the architectural style. The lower windows were round-headed and the upper ones pointed, thus showing a transition from the Norman to a later style. The church was about 97 feet long and 40 feet wide, the tower abutting on the north side of the quadrangle at the junction of the nave and chancel, and so forming by its base a single transept. A doorway of the fifteenth century still exists, which seems to have become the principal entrance to the abbey. There are a number of pit dwellings in Abbey Wood, Crayford and Bexley. Lambard says, "There are to be seen as well in the open heath near Crayford, as also in the closed grounds about it, sundry artificial caves or holes in the earth, whereof some have 10, 15 or 20 fathoms in width at the mouth, and thence downward narrow, like to the tunnel of a chimney or passage of a well, but in the bottom are large and of great receipt, inasmuch as some of them have sundry rooms or partitions one within another, strongly vaulted and supported with pillars of chalk." Tacitus says, "They (the Saxons) are accustomed also to open caves underground, and in case of the approach of an enemy the open country is ravaged, but these hidden and excavated places are either unknown or escape from the very circumstance that they must be searched for." I have already described these caves in my former paper on "Charlton-on-Thames."

On Bexley Heath, near here, the London United District of the Ancient Order of Foresters have pitched their tent and built the first wing of an asylum from my plans. The arms of the family of Lucy, founders of Lesness Abbey, used to be in Bexley Church, as described by Mr. E. S. Johnson in the "Summer Excursions" of this Society, 1886. Archdeacon Smith mentions "a Scotch fir in Belvedere Park has reached the height of 70 feet, and is a conspicuous landmark far up and down the river."

I cannot conclude my notice of Erith without mentioning that it was inside the church the barons met in the reign of King John to discuss the provisions of Magna Charta before meeting the king at Runnymede. I have been very kindly furnished by our friend Mr. W. F. Harradence with the following notes on

Belvedere.

The word Belvedere, though used by the French to signify a terrace or turret, is really derived from the Italian, and signifies a beautiful sight. The mansion so named was built by Mr. Hayley, from whom it was purchased by Lord Baltimore, who died there on April 24, 1751. Mr. Gideon then purchased the property, and his son, Sir Sampson Gideon, who in 1790 was created Lord Eardley, rebuilt the greater part of the house, but the drawing-room of the earlier building still remains. In 1794, Maria Marow, the eldest daughter and co-heir of Sampson, Lord Eardley, was married to Gregory William, the eleventh Baron Saye and Sele. On the death of his father-in-law, the baron, complying with a proviso in the indenture of settlement, by royal license assumed the surname and arms of Eardley. In 1844 the baron died, and on the death of his son three years later, the property reverted to Sir

Culling Smith, who assumed the name of Eardley. Mr. Ruegg, writing about that time, told how lapwings, starlings, fieldfares, redwings, blackbirds, thrushes and larks made the district their home, and how even kites, kestrels and sparrow-hawks abounded. Lord Saye and Sele had contemplated introducing black grouse into the park, but his intentions were never carried out. A considerable portion of the estate had been sold by Sir Culling Eardley, and from his son the mansion and the remaining twenty-four acres were purchased in 1860 by Lieutenant Lean, R.N., for 12,148*l*. The very beautiful collection of paintings by Murillo, Teniers, Rubens, Hals, Matsys, Breughel and Van der Weyden was dispersed, and the mansion was converted into the Royal Alfred Institution for Aged Merchant Seamen, of which the Duke of Edinburgh was patron. John Harris conjectured that the bank or ridge commencing at the corner of Bostal Heath, and proceeding by the side of the present Woolwich Road through Abbey Wood and Belvedere Park to Friday Hill, was a Roman road, and that the old iron-smelting furnace near by was used by the Romans. From Belvedere House an extensive panoramic view is seen as of old; but the birds have flown, the trees have been felled, and the site of the beautiful park is crowded with tenements.

There is a very excellent view of Belvedere House in Hasted's "History of Kent." Gwilt, in his "Encyclopædia of Architecture," says:—"Belvedere House was designed by James Stuart, architect, who, in conjunction with Revett, about 1762 published the well-known work, 'Antiquities of Athens,' and thus acquired the sobriquet of 'Athenian Stuart.'" Not having visited this locality for many years, I was unaware till recently of the dispersion of its famous picture gallery, once the finest in Kent, and second only to that at Knole House. We may, however, console ourselves by the reflection that it would seem appropriate and in the fitness of things that Erith, this "Old Haven" and subsequent dockyard, almost the cradle of the English navy, should now find a home for our ancient mariners.

THE GEOLOGICAL SURVEY OF ENGLAND.

THE following record of geological work in England during the past year has been prepared by Sir A. Geikie, the director-general:—While mapping the drift and tracing the outcrop of the Rhaetic beds in the heart of England, Mr. Fox-Strangways has had occasion to revise the mapping of the area of Charnwood Forest. In that district a group of ancient rocks has been long known to exist, regarding the nature and age of which considerable difference of opinion has been expressed. In re-mapping the ground with the advantage of maps on the scale of 6 inches to a mile Mr. Fox-Strangways has ascertained that the overlap of the old rocks by the new red marl is much more extensive than had been supposed, and that in fact more than half of the area hitherto represented as occupied by the old rocks is really covered by the younger formations. The field-work over that interesting area has now been completed, and a large series of specimens collected from it has been placed in the hands of Mr. Watts for determination. Perhaps the most important new facts noticed in the course of the survey have been obtained at Baddon Wood and Garendon, where the contact of the eruptive rocks with the surrounding altered strata has been observed. The re-survey of the ground has likewise shown more clearly than was before known the abrupt topography of the land that sank beneath the waters in which Keuper marls were deposited. The old rocks hardly extend beyond where they are actually visible at the surface, and in many places where they descend steeply beneath the marls they must have risen as craggy or peaked islets out of the Triassic waters.

The so-called Skiddaw slates of the Isle of Man have occupied Mr. Lamplugh during most of the working season. He has found everywhere that they have been folded, faulted and sheared, these proofs of intense mechanical movement being more particularly visible along the coast-section. The complicated structure thus produced has been well brought out by the mapping of the quartzites, which occupy certain areas in the south of the island. The apparent great thickness and order of succession of the strata were found to be deceptive, the quartzites really forming comparatively thin sheets, but reduplicated by constant folding. In consequence of this complexity, no clear idea has yet been formed of the probable stratigraphical succession among the Skiddaw slates of this region, though certain broad zones of slate have been followed into the interior, while other flaggy beds have been traced northwards to Peel, until they are faulted against the Peel sandstone. An interesting feature among the Skiddaw slates of this island is the occurrence of certain coarse and fine breccias of slate fragments, which are considered by Mr. Lamplugh to be friction-breccias, produced by the breaking up of the slates under shearing-strain at the junction between harder and softer strata. He has found some obscure organisms in the slates, but nothing as yet of definite palæontological value. Much time has necessarily been taken up in mapping

the abundant dykes and veins of the Isle of Man to which reference was made in last year's report. It has long been known that these rocks belong to two distinct geological periods, viz. pre-carboniferous and post-carboniferous. The latter Mr. Lamplugh has found abundant on the west coast in the cliffs below Port Erin and Glen Meay. They occur also on the east coast as far northwards as the mapping has extended; but they are rarely exposed at the surface in the interior, although met with in mining. The earlier dykes, of pre-carboniferous age, occur almost everywhere in the Skiddaw slate area. They have generally undergone much shearing; and although they cross the contortions of the sedimentary rocks, they are occasionally themselves contorted. They present great diversity of lithological character. Certain petrographical types among them will not improbably be found to form definite zones. Thus an interesting set of quartz-keratophyre dykes (containing white mica) is found on the west coast between Fleshwick Bay and Lag-ry-Keeley, while between Glen Meay and Peel the dykes are of a totally distinct character (diabase?), and contain much dark mica. North of the Peel sandstone area still another type of dykes and intrusions is to be seen. Numerous specimens of these various rocks have been collected, and are now undergoing microscopical examination. On the west coast of the island, to the north of Peel, certain red sandstones occur, the exact geological age of which is still uncertain. Fossils have been known to occur in them, and Mr. Lamplugh has made an important collection of these organisms, which consist chiefly of rolled corals with some obscure gasteropods, brachiopods and polyzoa. The specimens obtained by him have been submitted to Messrs. Sharman & Newton, Palæontologists to the Survey, who find that though they are hardly specifically determinable, the corals seem to point to an Upper Silurian or Devonian origin.

In the progress of the survey of the Devonian rocks of South Devon the Plymouth area has been brought into connection with those of Newton Abbot and Torquay, and the same sub-divisions have been found to hold good in it as have been established further to the east. Thus the presence of Upper Devonian rocks has been proved by the discovery of the characteristic Entomides near Tor Point on the west or Cornish side of Plymouth Sound, in a series of slates which, developed on the north of the Plymouth Limestone, correspond in lithological character to the Entomis-slates of Torquay and Newton Abbot. The igneous rocks so abundant in the eastern part of the Devonian area have been traced westwards to Plymouth Sound. Those in the Upper Devonian series seem to be, as at Newton Abbot, for the most part intrusive. The Ashprington volcanic series has been traced continuously from the Totnes district, but in irregular and greatly diminished thickness.

The re-survey of the South Welsh coalfield on the maps of the 6-inch scale has made increased progress during the past year, as Mr. Strahan has been joined there by Mr. Gibson. Sheet 249, new series of the 1-inch map, has been completed, and sheets 232 and 263 have been begun. The area which has now been surveyed extends a little west of the Taff Valley, and includes the Caerphilly and Llancaiach basins, in both of which the Mynyddislwyn coal has been extensively worked. These basins are separated by an anticlinal ridge, which forms an important feature in the structure of the coalfield, from the fact that it brings the lower or steam-coals up to within workable distance from the surface. Special attention, therefore, has been paid to tracing out the exact position of the anticlinal and synclinal areas. In the ground outside the limits of the Mynyddislwyn vein (which was referred to last year as affording an excellent horizon) some impersistent coals of little commercial value have supplied the only indication of the structure of the ground. By tracing the crops of these seams Mr. Strahan has ascertained approximately what part of the Pennant Rock forms the surface of the ground over most of the area. The importance of the information thus obtained, and the desirability of tracing the faults that cross the anticline, will be readily understood from the fact that the principal collieries are now, or must in the future be, situated on the line of axis. Mr. Fox-Strangways has continued the survey of the Triassic area of Leicestershire. The chief results of his work have already been noted when referring to the area of Charnwood Forest.

In Staffordshire, Derbyshire and Cheshire, Mr. De Rance's drift survey has mostly lain over areas shown as Trias on the map of the solid geology, but largely covered by drift. Mr. De Rance has made a detailed examination of the sections that were exposed along the sides and in the bed of the Manchester Ship Canal, but which are now covered with water. The exposure of Triassic rocks there displayed seemed to prove that the upper mottled sandstones are much thicker in that district than was originally estimated.

Mr. De Rance makes a special report upon the results of borings which have been in progress for some years past in the Fleetwood and Presall district, and near the southern margin

of the Lancashire coalfield, and the northern margin of the Cheshire coalfield. The Fleetwood and Presall borings made to explore the salt deposits have shown that sandstone precisely similar to the Garstang sandstone underlies the Keuper marl of that area. The Garstang sandstones have hitherto been classed as Permian, but there can now be no doubt that they should be regarded as Triassic. This change brings the red rocks of Lancashire into harmony with those of Cumberland, where the St. Bee's sandstone, formerly classed with the Permian, is now regarded by the Survey as Trias.

The explorations along and beyond the southern border of the visible part of the Lancashire and Cheshire coalfields are significant in another direction. They appear to prove that in both counties the lower mottled sandstone, hitherto taken as the base of the Bunter, belongs to the Permian series, for above it, and below the Bunter pebble beds, lie marls with *schizodus*.

The only member of the staff engaged in mapping the jurassic system in England last year was Mr. Cameron. While carrying on the Drift Survey in Huntingdonshire and the adjacent counties he has revised the lines of the jurassic formations shown on the published map. In so doing, he has found corallian fossils in some new localities in the great clay series of Huntingdonshire and Bedfordshire, but the sections where the organisms occur are so few that it has been found impossible to map the corallian strata separately, and they have accordingly been left coloured as Oxford clay.

Messrs. H. B. Woodward and A. Strahan made an examination and measurement of the jurassic formations in the Dorsetshire cliffs, from near Swanage to near Weymouth, for the purpose of obtaining material for a detailed section. At the same time Mr. Strahan took upwards of seventy photographs of features of geological interest on that coast line, many of which are being prepared for exhibition in the museum, each accompanied by an explanatory sketch. Others were taken with a view of being reproduced in a forthcoming memoir. The most important contribution made by the Survey during the year to jurassic geology is the volume of the "Jurassic Memoir," by Mr. Woodward.

In confirmation of what was said in the last report regarding the advantage of tracing the sub-divisions of the chalk, Mr. Hawkins reports that the middle and lower chalk can be shown to occur in the valley of the Meon in Hampshire nearly as far south as Meon Stoke and Droxford, where they were not previously supposed to be visible. Similar evidence of the value of tracing these sub-divisions has been obtained in Dorsetshire by Mr. Jukes-Browne in ascertaining the continuance of the Melbourne rock and chalk rock through the county. The lower and middle chalk are found to diminish in thickness towards the west; the former also thinning southwards down to 50 feet or less. A bed of smooth chalk appears between the Belemnite marl and the Melbourne rock, and thickens in the same direction in which the lower chalk thins. The chalk rock of Dorset varies much lithologically. In one place (Winterbourne Abbas) two beds of hard brecciated rock were found to be separated by 5 or 6 feet of softer glauconitic chalk containing large grains of quartz. The brecciated material contains small fragments of fine-grained greensand, which, as Dr. Barrois has noted, correspond with varieties of upper greensand, indicating possibly that the upper greensand was undergoing erosion not far from this place during the formation of the chalk rock.

Along the southern strip of Sussex extending from Eastbourne westwards into Hampshire, the sub-divisions of the chalk, which were traced during the Drift Survey of that district, are now shown both on the old and new series of maps. A boring east of the Lincolnshire chalk area near Willoughby proved that the Tealby series there underlies the glacial drift. It seems probable that a long tongue of lower cretaceous rocks runs north-west past Alford to South Thoresby, where these beds are exposed at the surface. This alteration with other minor corrections were made by Messrs. Jukes-Browne and Strahan, and have now been engraved on the map (sheet 84). An account of this boring at Willoughby, with its bearing on the general structure of the district, has been published by Mr. Jukes-Browne. (Quart. Journ. Geol. Soc., vol. 49, p. 467.)

The progress of the mapping of the Eocene deposits in the western part of the London Basin has, during the past year, cleared up the true position of the Ramsdell clay. It appears from Mr. Blake's field work that two distinct beds of clay have been classed together, though one of these really belongs to the London clay, while the other forms part of the Bagshot series. This observation is of some local importance, inasmuch as it removes the trace of what appeared to be an overlap or unconformability between Bagshot sand and the London clay, the outcrop of the latter having been made too narrow at one place on the published map.

The mapping of the Eocene deposits of Hampshire has been carried on by Mr. Clement Reid westwards into Dorset. Several unexpected features have arisen in the course of the work, regarding which it is hoped that some definite information may be given in my next report.

The survey of the superficial deposits has made steady progress during the year, 2,711 miles of boundary lines having been traced. Few observations, however, have been made which seem to call for special mention in this report. Mr. De Rance has noted the character and position of nearly five hundred boulders from 2 to 12 feet in length in East Cheshire, and has supplied information concerning them to the British Association committee on erratic blocks.

In the prosecution of the re-survey of the South Wales coalfield the superficial deposits are mapped simultaneously with the solid geology, and during the past year Mr. Strahan has found that the drift increases in importance towards the west. In the form of mounds of gravel and gravelly clay, it overspreads much of the low ground and runs up all the main valleys. Many additional instances of glaciated rock-surfaces have been observed, showing a southward movement of the ice.

In the course of the survey of the Isle of Man, some interesting information regarding the glacial deposits has been collected by Mr. Lamplugh. He has observed and recorded glacial striæ in some sixty localities, indicating a general movement of the ice along the main axis of the island, although on the lower ground towards the south-west the movement appears to have been nearly in a north and south direction. The drift deposits of the western side of the island south of Kirk Michael are separable into two groups, one of which clings to the high land and consists entirely of local detritus, while the other covers lower ground, is largely made up of material foreign to the island, and generally contains shell-fragments. These two groups seem to dovetail into each other. The drifts in the lower grounds, containing far-derived materials, are generally stratified, sometimes arranged in kame-like mounds and sometimes forming definite platforms. On the foreshore at Kirk Michael some fossiliferous sands lie near the base of the drifts. Striking examples of steam-erosion, hardly explicable under existing topographical conditions, have been observed by Mr. Lamplugh. These and the higher platform gravels of the central valley of the island probably date from the close of the glacial period.

In addition to the ordinary petrographical work, the petrographers occasionally encounter problems which require for their solution a knowledge of the chemical composition of certain rocks. Mr. Teall during the past year has made four analyses of this nature in the laboratory of this institution, and two others have been made for us in the metallurgical laboratory of the Royal School of Mines, for which we are indebted to the courtesy of Professor Roberts-Austen.

The mineral riebeckite is at present known to occur at so few localities that its recognition as a normal constituent of the granophyre of Meall Dearg, near the head of Glen Sligachan, in Skye, seems to be of sufficient importance to deserve mention here, especially as fragments of riebeckite-bearing rocks occur not infrequently in the glacial deposits of our west coasts. The discovery of this mineral in the Skye locality was made by Mr. Teall in the course of his examination of a series of slides made from specimens collected there last year.

The members of the Geological Survey, besides the researches which they may be able to carry on in their own time apart from their official duties, are led in the prosecution of these official duties to make many original observations which, though often of considerable scientific interest and importance, can sometimes hardly be appropriately made known in the publications of the Survey, or must wait for some time until a convenient place can be found for their announcement in any official form. It is not desirable, either in the interests of science or of the able investigators themselves, that these observations should remain indefinitely unpublished. Hence it has been customary to allow the results of research by members of the Survey, after having been submitted to the Director-General, to be made known to the world in anticipation of any subsequent publication of them in an official form. In this manner much good work has been brought without delay before the general body of geologists, and the scientific reputation of the staff of the Geological Survey has been well sustained thereby.

YORKSHIRE ARCHÆOLOGICAL SOCIETY.

THE members of this Society have just paid a visit to Middleham. More than fifty members assembled, and among them was Canon Greenwell, of Durham. Mr. Brown, secretary of the Society, acted as cicerone. The party proceeded in waggons to the ruins of Middleham. This was built probably about the twelfth century, and became the chief residence of the King-maker, Earl of Warwick. From thence he went forth to defeat the Lancastrians at Blore Heath, and here Edward IV. was kept a prisoner, and a very easy sort of imprisonment it was, for he was allowed the privilege of hunting, and one day his horse carried him so far that he never came back again. All this and much more, the *Leeds Mercury* says,

anyone may read for themselves in Bulwer's "Last of the Barons." Simple people go to Middleham Castle with the belief that Richard III. was a very unsavoury character, anything but to be desired. They come away finding him a most popular person, beloved of all his tenants; his badge (the boar) being still the most conspicuous in the town, whereas elsewhere it was defaced and pulled down, the murder of the Earl of Northumberland by Yorkshiremen being inspired by their love for the hump-backed Luke. The architecture of Middleham was explained, and one felt that if Duke Richard daily filled the great dining-room with his neighbours, and used the buttery hatch to distribute the broken victuals to the poor, there would be little to wonder at in his popularity if he had been the hangman himself. From the castle a move was made to the church, once held by a body consisting of a Dean and six Canons, founded by the piety of the aforesaid Richard III. There was little in the church calling for remark beyond two small openings at the east end, which certain benighted people thought were leper windows. "Not at all," says the antiquary, never so delighted as when overthrowing a popular myth; "lepers were kept in the hospital, of which there was one at Middleham, and never came to church at all. The openings were for the ringing of the Sanctus bell, to let people know when the Host was elevated." If there was nothing interesting in the church there was in the statutes of the Canons prescribing their eating and drinking, for it would seem they were allowed to get two butts of wine annually from Duke Richard's bounty. Now, as there were only seven of them to enjoy it, one may see what a liberal allowance this was. Mr. Andrew Lang has been saying lately that if he had to choose when he would like to have lived, he should have chosen the Middle Ages as to time and a monastery as to place. The Canons at Middleham at least seem to have had a good time of it. Leaving Middleham the party drove off to Coverham, where the very name of the abbey shows the wisdom of Mr. Lang's choice. It was a "Premonstratensian," so called because the Virgin herself appeared to the founder, and showed (premonstravit) not only where she would have it built, but also the shape of it, and even what its inmates were to wear. We toil and trouble over plans and sit on committees, and probably fail after all; Saint Noribert simply went to sleep and everything was done. At the dissolution certain charges were made against the Prior, but he cleared himself so successfully that the king granted him a handsome pension. After Coverham the route lay through the racing stables for which the neighbourhood is now famous and which were much too modern for archaeologists to take any interest in, and so no stop was made until the unrestored church of Wensley was reached. Here is a very fine brass of a former vicar, perhaps the best in existence, and the family pew of the Lords of Bolton, which reminds one that if there are no distinctions in the church above, there certainly are in the church below. Here the party listened to a charming address on "Memorial Crosses," by Canon Greenwell, who begged all lovers of what was ancient to preserve them from fracture or desecration, and even going so far as to say that if those who had the care of them would not do so, even when their duty was pointed out to them, then they should be taken and placed where they would be cared for; a sentiment the antiquaries quite agreed with. A short drive back to Leyburn brought an enjoyable excursion to a close.

GLASGOW ARCHÆOLOGICAL SOCIETY.

TO the many pleasant excursions made by this Society to places of archaeological interest in Scotland falls now to be added that to the island of Inchcolm, in the Firth of Forth. There were few of the party, however, who did not, the *Glasgow Herald* remarks, recall the fact that it is only two years ago since Professor Veitch, one of the Society's ex-presidents, had been the Society's valued guide on such another excursion to the archaeological relics of his own Tweedside. Inchcolm Island occupies a position of great beauty, with, as one looks to the sea, Aberdour across the waves to the left, and nearer at hand lie the beautiful woods and grounds of Donibristle; on the right hand, but as it were behind us, are Dalmeny and Barnbogle Castle, and in the distance the grey smoke of Edinburgh, with Arthur's Seat towering aloft. A paper was read by Mr. J. Dalrymple Duncan, F.S.A., one of the hon. secretaries. The island was traditionally a residence of St. Columba while conducting his missionary enterprise in the surrounding district, and at all events was early looked upon as a place of peculiar sanctity. According to Hector Boece, the Danes, after their defeat at Kinghorn, besought of the victors the privilege of burying their dead in the island. In "Macbeth" Shakespeare duly makes Rosse, after he has reported the successful issue of the contest, state that:—

Sveno, the Norways king, craves composition;
Nor would we deign him burial of his men
Till he disbursed, at St. Colme's Inch,
Ten thousand dollars to our general use.

A sculptured hog-back stone still on the island is supposed to

be a Danish monument. The humble cell of a Culdee hermit who succoured King Alexander I. when wrecked there, has now been restored in a simple and satisfactory manner. It is of unique archaeological interest. Although Alexander vowed to erect a monastery on Inchcolm, it owes most to his successor David, the "Sore Sanct." The order established was that of Canons Regular of St. Augustine, who were not absolute recluses, but were allowed to perform the duties of parochial clergy. In 1543 the last abbot surrendered his office and the island ultimately passed to the Earls of Moray. From Inchcolm the Archæological Society proceeded to Aberdour, and after luncheon visited the remains of Aberdour Castle, the keep of which is believed to have been erected about the beginning of the fifteenth century. The double terrace in front of the castle commands a lovely view of the Forth. From Aberdour the party drove to Dalgety Old Church, where the Rev. Mr. Craig, the parish minister, gave an interesting account of this pre-Reformation building and its curious monuments and inscriptions. A short but beautiful drive brought the party to Donibristle, one of the seats of the Earl of Moray. Here Mr. Normand, the Earl's commissioner, and the Rev. Mr. Craig acted as courteous and efficient guides. The central portion of the house was destroyed by fire about forty years ago and has never been rebuilt. The older subterranean passages where the Bonny Earl of Moray was murdered in 1592 are, however, still intact, and were visited with much interest. The situation of Donibristle is one of exceptional beauty, and the grounds are maintained in excellent order, although the noble owner has not for many years been within their gates. On returning to Aberdour the Society dined in the Aberdour Hotel, with Mr. Dalrymple Duncan as chairman and Mr. W. G. Black as croupier, and thereafter returned to Glasgow.



Decoration of Glasgow Municipal Buildings.

SIR,—I suppose there was no painter who read your account of the proposals for the decoration of the Glasgow Town Hall and did not rejoice at the chances which await Glasgow artists, for I hope the commissions will be given to local artists alone. The city is nurturing a school of art that has gained both admiration and patronage abroad. For the school in the present state there could hardly be a more advantageous influence than would be offered by a competition for the adornment of a large public building. At the same time, it will be risky if the Corporation and citizens insist on the completion of the work at once. Let them consider how long the Panthéon in Paris has taken. The spandrel figures by Baron Gros were executed in the early part of the century, and they have had their use, because they made it apparent that a very different style was needed. What it was can hardly be said to be yet settled. When the commissions for the decorations of the lower part of the building were assigned, it was understood that every artist was to follow the style he preferred, or which could be considered most characteristic of his ability. As everybody knows, Meissonier could not make up his mind about the treatment. He made a design, but the colour obstacle daunted him. Yet he was not worried, although all amateurs were more curious about his experiment than any of the others. In the Panthéon M. Puvis de Chavannes demonstrated that decorative work differed from easel work, and although the other painters, including Meissonier, held some notion of the same kind, with all their experience they could not realise what it meant until they saw the panels representing the childhood of St. Geneviève. One of the competitors who was opposed to the style of M. Puvis told me he was greatly grieved because his own work had not been completed before that master's. The treatment which made the panels less obtrusive than the masonry could not well be imitated by other painters in the same buildings. Despairing of an attempt of the kind, several of the painters, as if to show their independence, emphasised their own peculiarities. M. Laurens is more sombre in the Panthéon than is common with him, and he is generally in a tragic mood. M. Cabanel goes beyond his average prettiness, and so of others. But on that account the secularised church gains more interest than if the treatment were uniform. If one man is able to take up the decoration of a building, it may be a question whether it is preferable to compel him to adhere to uniformity, or to allow him to express the growth of his powers. I cannot believe that M. Olivier Merson, if requested to add others to the "two beautiful frescoes, or rather wall-paintings" admired by the Glasgow councillors in the Palais de Justice, would adopt the archaic treatment seen in them, and which he

relished in his youthful days. He has attained an amplitude of style which I fancy he would not, perhaps could not, neglect for the sake of insuring uniformity. In Glasgow it will be wise to allow as many competent artists to co-operate as can be found in the city, but at the same time every allowance should be made for them if they show timidity before grappling with their subjects. An ordinary easel picture we know can be relegated to a cellar or an attic if the possessor has attained a connoisseurship which makes him undervalue it. For a wall-painting there is no escape. It is fixed to one position, and must continue to submit to the criticisms of generations. A painter who remembers the fate of his work should be excused if his fastidiousness occasionally gets the better of him.

For these reasons I hope the Corporation will not adopt the course that is advantageous with constructive works above or below the streets. It is well to assume that works of that kind can be accomplished with as much regularity as if they were the product of machines. But a novel kind of painting that is expected to represent the utmost competence of the great city of the North should be considered in another light, and no estimates made of the quantity that can be produced per month or per year. If the Corporation will take the trouble to consult with painters who propose to attempt the work, trouble will be spared hereafter.—Yours truly,

R. I.

Old St. Paul's.

SIR,—In your issue of the 7th inst. you say, "The geography of the British Isles could not then be taught in schools, because the author has to inform his readers that Portland is in Dorset." Might I add that this information is necessary in many cases nowadays, in spite of all the education of Board and other schools, for hardly a week passes without letters being addressed to me at "Portland, Isle of Wight," "Portland, Devonshire," &c., instead of "Portland, Dorset." A wrong idea concerning the place seems also very prevalent, many people that I have met being under the impression that Portland is a rock, solely inhabited by the convicts and those who have to do with them, and that they quarry the stone, which gets from their hands by some means or the other into the market. Only so recently as September 7 I happened to be returning from town with a lady who had travelled down from the North of England to meet her husband, a captain of a steamer which was calling at the island for coals, and as she had missed one train and there were two hours to wait for the next before she could get to Portland, I suggested she should drive there by cab, and to my astonishment found she was afraid to venture by herself and child in a cab, and upon my inquiring why, she said she was under the impression that the island was solely inhabited by convicts, and she was afraid of molestation. When I assured her she might with perfect complacency drive in, and trust herself to the tender mercies of the driver, whose only object would be to reach the destination as soon as possible and return home with his money and go to bed, she seemed much obliged.—Yours obediently,

Portland, Sept. 8.

F. J. BARNES.

Ventilation and Flushing of Sewers.

SIR,—I have read with much interest "Engineer's" letter on this subject in your last issue, and having been engaged exclusively for the last nine months in studying and experimenting upon the ventilation of sewers, in conjunction with Mr. Caink, Assoc. M.Inst.C.E., our city engineer, I should like, with your permission, to give the results of our work.

Mr. Caink long ago came to the conclusions which Dr. Clark has recently expressed, and which "Engineer" and other authorities now endorse, namely, that the so-called "free ventilation" of sewers is a wholly unnecessary evil; that to encourage or allow air to rush through them is simply to brush the foulness off their walls into the streets, and that ample relief of pressure is all that is needed.

Dr. Clark proposes to relieve by occasional high shafts. "Engineer," rightly objecting to these as only raising the danger from street to bedroom-window level, advocates the use of furnaces to purify the necessarily outgoing sewer air by heat.

Mr. Caink, troubled like most municipal engineers by complaints of smells, has tried in practice both the remedies suggested above. He found it difficult to obtain permission to put up high shafts, costly to erect and maintain them, impossible to render them anything but unsightly, and finally, more dangerous to discharge poisonous gases near bedrooms than at ground-level. Complaints in some cases did cease, but sleepers rarely complain.

The constant expense of gas furnaces is against them; they act only for a limited distance, and if they are called upon to act as inlets (and it must be remembered that about as much air must enter a sewer as leaves it) they are very liable to blow out.

These experiences led Mr. Caink to adopt a system of filtration by cotton wool placed in the existing manhole and lamphole shafts, and kept dry and pervious by a heat-equalising arrangement which prevents that condensation so fatal to previously designed filters. The system, while checking the irresponsible and erratic action of the wind, allows ample ingress and egress for air—"breathing," in fact—and all expirations are rendered harmless by the germ filter.

The manholes on a troublesome and noisome length of sewer here were fitted a year ago with these filters. Fear was at once expressed that we were only "bottling up the stench," which would come out somewhere else instead. To test the truth of this supposition I have taken anemometer readings at the holes (five in number) at various times on upwards of sixty days since the beginning of this year, with the result that I never found all, and scarcely ever even a majority, of the shafts acting as outlets. Manifestly, had there been an accumulation or "bottling up" of pressure, each shaft (the filter therein being temporarily removed to admit the anemometer) would have shown an out-current.

In addition to proving absence of pressure, these long-continued observations have shown—what Mr. Mansergh found in more extensive trials at Beckenham—that the direction of flow of air, to and from sewers is extremely erratic and not to be foretold. Lower the anemometer into a shaft, and it will, perhaps, show a strong in-current. In a few minutes, or seconds even, it will reverse, and a stench of a most unpleasant nature will issue. Then the vanes may remain motionless, then turn one way, then the other—all of which clearly shows that not more ventilation but less is required—less disturbance, less idle rushing through the ever foul tube of air-currents induced by the wind, and more gentle and equable relief.

I enclose chart of observations for your inspection. Each of the 400 odd squares represents the net result—total in and out-current—during a fifteen minutes' reading. Fully a half of them, you will see, show some in and some out-current. Unfortunately it is impossible on so small a scale to record the frequency of the alterations of direction or number of "respirations" in each quarter of an hour.

Since the "Cainks" have been in there has been no nuisance on this length, and we are now fitting other troublesome places with the filter, which is also being tried in other towns. It seems to me exactly to meet "Engineer's" suggestion of allowing for "constantly circulating a smaller quantity of air through the sewers by means of ventilators which, by heat or some other means, render the gases passing out quite innocuous so far as their power to produce disease is concerned."—Yours truly,

W. E. BUCK.

Worcester: September 10, 1894.

GENERAL.

The Marquess of Lansdowne and Sir Charles Tennant have been appointed to succeed Sir A. H. Layard and Viscount Hardinge as trustees of the National Gallery.

The Dean of Lichfield, in speaking about the restoration of the cathedral on Saturday, mentioned that 90 years ago some of the finest stained-glass in the world had been discovered in a barn in Belgium, which had been employed to fill seven of the windows in the lady chapel. Similar glass, about 350 years old, was lately discovered in a cellar in London, and was secured for the cathedral.

The Annual Exhibition of Art which was opened in Berlin last May has been a financial failure, and the committee will have to meet a deficit.

The Abbé Sobaux has had plans prepared for a new church at Montmartre, the walls of which will be constructed of iron and cement. A site has been secured in the Place des Abbesses. If funds admit, mural painting and stained-glass will be largely employed.

The Scheme proposed by Mr. James F. Reade, A.M.I.C.E., London, for the supply of water to Kilkenny has been accepted by the Corporation of that city. Fourteen schemes were submitted, but the names of the other competitors have not been published as the terms of the competition were strictly secret. The estimated cost is 21,500*l*.

The Expenditure on the church at Montmartre, Paris, has reached the sum of 26,960,000 francs. The subscriptions during July amounted to 96,597 francs, making the total receipts 27,594,713 francs.

The Lord Mayor of Manchester on Wednesday distributed the prizes to the successful students of the Manchester Art School.

A new pleasure pier and pavilion is to be constructed at the west end of Morecambe, the plans for which are being prepared.

The Architect.

THE WEEK.

THE eighteenth course of lectures and demonstrations for sanitary officers which will soon commence at the Sanitary Institute will be of a very scientific character, and as the lectures are to be given in the evening they are worth the attention of students of architecture. There will be two lectures on Elementary Physics by Mr. JOHN CASTELL-EVANS, F.I.C. A Practical Demonstration of Examples of Building Construction under the By-laws and Offensive Trades, &c., at Mitcham, conducted by Dr. L. W. DARRA MAIR. Two lectures on Elementary Chemistry by Dr. S. RIDEAL, Public Analyst. One on Elementary Bacteriology by Dr. R. T. HEWLETT. Sir DOUGLAS GALTON will lecture on Ventilation, Warming and Lighting. Mr. H. LAW, C.E., will explain the Principles of Calculating Areas, Cubic Space, &c.; Interpretation of Plans and Sections to Scale. Among the lectures will be Water Supply, Drinking Water, Pollution of Water, by Mr. J. WALLACE PEGGS, C.E.; Sanitary Building Construction by Mr. KEITH D. YOUNG; Sanitary Appliances, by Prof. W. H. CORFIELD; Details of Plumbers' Work, by Mr. J. WRIGHT CLARKE; House Drainage, by Mr. W. C. TYNDALE, C.E.; Sewerage and Sewage Disposal, by Prof. HENRY ROBINSON, C.E.; Scavenging, Disposal of House Refuse, by Mr. CHARLES MASON, C.E.; Sanitary Law, English, Scotch and Irish, General Enactments Public Health Act, 1875, Model By-laws, &c., by Prof. A. WYNTER BLYTH; Sanitary Laws and Regulations Governing the Metropolis, by Dr. LOUIS PARKES. There will be several inspections of sanitary and other works.

In the quarterly number of the "Illustrated Archaeologist," which Mr. J. ROMILLY ALLEN edits with much judgment, there is a suggestive article by Mr. G. F. HILL on "Roman Copies and Greek Originals." It refers to the importance which has been of late given to Greco-Roman statues as if they were faithful copies of Greek works. Mr. HILL considers that they should not be accepted unreservedly, and he bases his argument on what is known about coins. There are undoubted originals of some Greek coins, although they are not as abundant as is imagined, and there are copies which are often taken for originals. The majority of visitors to museums would confound the two varieties, especially as there was no means in old days of exact reproduction by electric agency. It is only necessary to examine them in detail to perceive the difference, which can also be made manifest from photographic plates. Mr. HILL sums up by saying, "Greek art advanced by distinct stages; and it is quite possible to extract from Roman copies, considered intelligently in relation to such originals as we have, much information as to the treatment of hair, drapery, attitude, proportion, &c. by different schools, and even by the same artist at different stages of his development. But these things are nothing more than the externals; they can never give us a real knowledge of what Greek art was. For this we must seek the originals. We are richer in these than we were in the days of WINCKELMANN, and there is no excuse for neglecting them. In these days of popular lecturing the average person only sees what is thrown on the screen, and for nine archæological flirts who carry away a pleasant impression of the Roman copy perhaps one student remembers that it is nothing more than a suggestion of something much finer and more beautiful."

It is sometimes said that modern museums and picture galleries are only to be upheld by the outlay of large sums of money. The Irish National Gallery suggests how much can still be accomplished with moderate sums. Many a private collector might take the purchases of that institution as a guide. Under the late Sir HENRY DOYLE the gallery was created without causing any grumbling among taxpayers, and Mr. WALTER ARMSTRONG is conducting it with an equal respect for economy. Last year he had at his disposal no more than about 1,000/. Yet he was able

to secure the following examples:—Landscape (near Salisbury?), by JOHN CONSTABLE; Landscape in Wales, by J. D. HARDING; Irish Landscape, by BARTHOLOMEW COLLES WATKINS; Classic Landscape (water colour), by F. O. FINCH; Interior of a Flemish Mansion, by NICOLAS GISELAER; Farm House Interior, by D. TENIERS; Landscape with Cattle, by W. ROMEIJN; Martyrdom of a Saint, school of GAUDENZIO FERRARI; Still Life, by PIETER CLAESZ; Portrait of an Italian Gentleman, by ANDREA SOLARIO; Portrait of a Gentleman, Dutch school; Portrait of a Lady, by JERVAS; Head of a Man (pencil drawing), by ANTONIO MOR; Study of a Child (chalk), by FRANÇOIS BOUCHER. A series of lithographs after the cartoons of "H. B." (JOHN DOYLE), and a miniature Portrait of Richard Lalor Shiel, by J. HAVERTY, were also obtained for the National Portrait and Historical collection. The following donations were received during the year:—A Portrait of Lady Claud Hamilton, by JAMES SWINTON, was presented by the Hon. Mrs. SWINTON, the widow of the painter; a Portrait of Sir John Stevenson, Mus. Doc., was presented by the Marquess of HEADFORT for the Portrait Gallery; the Robing of Esther, by WILLEM DE POORTER, was presented by the Director; an Interior of a Guard Room, by PIETER POTTER, was presented by Mr. R. H. MILLNER. At the last meeting of the governors and guardians attention was again drawn to the urgent necessity for an extension of the gallery buildings, and when pictures are obtained so cheaply that is not surprising.

THE congress of the Sanitary Institute will commence on Monday next in Liverpool. The section of engineering and architecture has for president Mr. G. F. DEACON, C.E. The vice-presidents are Mr. CHARLES H. BELOE, Sir DOUGLAS GALTON, Mr. HENRY HARTLEY, Professor HELE-SHAW, Sir ROBERT RAWLINSON; and the hon. secretaries, Major LAMOROCK FLOWER, Mr. EDMUND KIRBY, Mr. W. HOWARD-SMITH and Mr. COARD S. PAIN.

It is well known that EUGENE DELACROIX was a great admirer of English art in various forms. The extracts from his journal which appear in the new number of the *Revue des Deux Mondes*—a periodical to which the great painter was a contributor—reveal that up to 1855 his opinions concerning English painting remained unchanged. "Among the English," he says, "there is a real finesse which dominates even the imitative efforts found here and there, as in our unhappy school. Finesse among us is the greatest rarity. Everything appears to have been done with coarse tools, and, what is worse, by obtuse and vulgar minds. Take away MEISSONIER, DECAMPS, one or two others more, and a few pictures of the youthful INGRES, and all is commonplace, dull, without intention, without warmth. This so-called land of drawing offers really no trace of it, not even in its most pretentious pictures. In the smallest English design well-nigh every object is treated with the interest it demands; landscape, maritime views, costumes, scenes of war, everything is charming, rightly touched, and above all drawn. What good faith amidst the pretended imitation of the old pictures! Compare, for example, *The Order of Release*, of HUNT or of MILLAIS—I know not which—with the work of our Primitives or Byzantines, those men of one idea who, with their eyes fixed on the images of another time, take nothing but the stiffness, without adding the qualities that belong to it. This mob of unhappy mediocrities is enormous. There is not a trait of truth in their work, of the truth that comes from the soul, not a single thing like this infant that slumbers (in *The Order of Release*) in its mother's arms, and whose little silken tresses, whose sleep so full of truth, and whose features, with all else, down to the very red of the limbs and the feet, are quite remarkable in observation, but above all in sentiment." DELACROIX was bilious and was not perhaps able to do justice to men like INGRES or the FLANDRINS, who were the pupils of INGRES. He lost no opportunity to strike a blow against the dominant schools. But he recognised in the English an effort which, if it differed from his own, was, like it, an assertion of liberty against academicism.

BETTERMENT.

THE select committee of the House of Lords on "Town Improvements (Betterment)" came to the conclusion that "The principle of betterment, in other words, the principle that persons whose property has clearly been increased in market value by an improvement effected by local authorities should specially contribute to the cost of the improvement, is not in itself unjust, and such persons can equitably be required to do so. But the effect of a public work in raising the value of neighbouring lands is shown by experience to be uncertain. Whether, in any particular case, it is possible for a valuer to pronounce that such an effect has been produced by the completion of any public work, is a point upon which the evidence of eminent valuers differs greatly."

In these words, and in the latter part of them especially, we have as fair a statement of the pros and cons of betterment as could be given by any body of men of business in the kingdom. People who have faith in change as a remedial agent commonly suppose that it is only necessary to undertake what is called an improvement, and that profits, more or less immense, are sure to follow immediately. It is not sufficiently understood that the making of new streets and the erection of houses in them are speculations, and as such are as liable to bring painful disappointments as any transaction on the Stock Exchange or the racecourse. Social and political reformers cannot believe in that sort of result, for they are generally gifted with an extraordinary amount of faith in the operations of their own schemes. Like the Cardinal in the play, they do not much believe in contingencies, and least of all in those which entail failure. But a valuer of property, like the commander of a ship, is bound to conclude that favouring gales are not always blowing. When, therefore, we find the Lords' committee declaring that "the effect of a public work in raising the value of neighbouring lands is shown by experience to be uncertain," it is evident that the testimony of gentlemen of experience and ability like Mr. EDWARD TEWSON, Mr. ROBERT VIGERS, Mr. WESTACOTT, and Mr. F. W. HUNT of London, Mr. BRIDGFORD and Mr. SINGTON of Manchester, prevailed over their lordships.

The evidence given by those gentlemen corresponds with the convictions of the majority of architects and surveyors who are no longer in the sanguine period of immaturity. The success of a street or of a building, where there is no compulsion such as necessity sometimes imposes, depends on what is the most uncertain of all things, viz. the whims of the public. One case which exemplifies the difficulty of judging of the future of new property in a remarkable way is unhappily familiar to every reader of a newspaper, that is, the notorious "New Arcade" in Tipperary. It was constructed at a time of extraordinary excitement, when the whole inhabitants of the town had resolved to withhold their custom from every dealer who occupied shops on the property of an excellent landlord, but who was destined for a victim. The shopkeepers, therefore, were compelled in order to gratify their customers to emigrate to the new arcade. The relations between the purchasers and vendors continued unchanged, for there was a mutual agreement in the exodus. It was reasonable to conclude that the speculation must be financially prosperous. Shrewd English visitors adopted that view, for every influence which prevails in trade was exercised in its favour. Moreover, anyone who was even lukewarm in supporting the arcade incurred risks which in Ireland can become fatal. Yet, in spite of the exceptional advantages possessed by the tenants, the shops turned out to be failures that might be called ludicrous if they did not bring misery to a crowd of dupes. The projectors have been afraid to approach the place, and have left the tenants in the lurch. The Tipperary arcade is an object lesson not only for those who may contemplate injury to their neighbours, but for all who believe they have only to set out a course, and that fortune must follow it. One party of politicians have employed the history as a warning to people who belong to a rival party, but it is no less striking if we consider it as an example of the hazards which await attempts to make trade deviate from established ways. It may be said that the Irish are spasmodic and impracticable. But how are we to explain the failures in

England, which are as real, although they have not been brought continually before the eyes of the world? The Columbia Market in Bethnal Green has had as little success as the strategic arcade. The benevolent lady who raised it has, out of pity for costermongers and their poor patrons, offered the stalls for a mere nominal rent, or all but gratuitously, yet the people preferred to endure the inclemency of the winter in the neighbouring streets rather than be sheltered in the costliest building of its kind in England. Wholesale dealers appeared to be no less afraid of Gothic architecture. Nobody could have foreseen such a result. As long as it exists experts must, however, be cautious in believing that success will attend all improvements. The property market is subjected to so many accidental causes, and is therefore so variable, that Mr. VIGERS was justified when he said to the committee, "I defy any man to say whether any house in London ten years hence is going to fetch the same rent, or more or less rent." London is not unique in this respect. The larger provincial towns are also affected in a manner that seems to be capricious, and in foreign capitals, where there is less liberty, similar mutations are not unknown.

In sharing uncertainty, property corresponds with many other things. Excellent books appear to be created for the benefit of the dealers in waste paper, and who can say what prices the costliest pictures will fetch ten years hence?

Some of our unprofessional readers may say that we have exaggerated the precariousness of the circumstances which surround property in towns. Let us take a few tests, and first some relating to property in new thoroughfares. Mr. VIGERS in relating his own experience was able to go back to the history of New Oxford Street. In the course of his evidence before the committee he said:

The traffic originally, in my younger days, used to go through Broad Street, Bloomsbury, and St. Giles, and it was a very difficult way to get the large traffic through. It was thought that a street joining Holborn and Oxford Street so short a distance apart would be a very valuable street. It is only within very recent years that the property has been at all a success. The effect was to simply destroy the property in Broad Street. When the houses (in New Oxford Street) were built they were occupied for short times. People went bankrupt in the street. They did not get proper interest on their outlay for their buildings, and it was a great failure.

The evidence given by Mr. EDWARD TEWSON (of the firm of DEBENHAM & TEWSON) was no less emphatic about the failure of that early improvement and of some others. He said:—

I have had large experience with reference to the creation of new streets in the City of London, and I know that no man could tell this year or next year what the probabilities of that new street will be. It is impossible to tell. We all of us know that London is very peculiar in that respect. It takes a very long time to accustom the inhabitants of London to go into new streets. Take for instance the Thames Embankment. I remember very well for many years having to come constantly to these houses and the Courts of Justice, and on the Thames Embankment one could frequently come from Blackfriars Bridge to Westminster without meeting a dozen carriages. It takes years to accustom the public of London to any particular street. I can give your lordships a good many illustrations with regard to the effect of that. First of all, Mr. Vigers spoke about New Oxford Street. I thoroughly agree with all that he said about that. When that was formed it was considered it would be equal, at all events, to the streets from which it formed a link; that is to say, Holborn at the east end and Oxford Street at the other. That has never yet been the case. The buildings in New Oxford Street have never yet realised the rents even now (and it is fifty or sixty years since it was formed) which were realised and are realised by the premises in Oxford Street and in Holborn. Then Victoria Street, Westminster, that also remains to this day unfinished. I have offered myself, only a few months ago, one of the largest sites in Victoria Street for sale, and failed to find a buyer. It has been empty ever since the street was formed and remains empty to this day. I know of my own knowledge, because I have had dealings with the buildings, that there is scarcely a building in that street that has been a success and that has paid the owner a reasonable interest on his outlay. Then Queen Victoria Street in the City. The Act for that was obtained in 1862. Enormous sums of money were spent on the buildings all through that street, and within my knowledge many very heavy losses have been sustained, and up to the present day a great many of the premises do not realise much more than the ground rents that are paid for them.

Another case was also cited by Mr. TEWSON in reference to a street which has gained unusual interest during the past week:—

Hatton Garden, which is at the base of the Holborn Viaduct, going west, was long the seat of the principal diamond and jewellery trades in London, the wholesale trades. When the Holborn Viaduct was made we had a great deal of business in Hatton Garden at the time, and we advised owners not to grant more than seven years' leases of

their premises in Hatton Garden, believing that the Holborn Viaduct would probably improve Hatton Garden. Your lordships will remember the approach then from the City down Snow Hill was a very awkward one, and we thought that the approach being improved by this Viaduct would give better access and necessarily would increase the value. We find now that instead of doing that, the properties are lessened in value, and that a large part of the diamond market has gone upon the Holborn Viaduct itself. These large buildings have very numerous upper floors; the shops let very readily for trade purposes, for retail tradesmen; but there is a difficulty in getting tenants for the upper floors; and, therefore, they have been offering them at low rates, and a great many of the principal diamond merchants have gone there, to the prejudice of the old market, which was in Hatton Garden. That is an illustration that bears on the question, because if ever there was an improvement in London that would be called a local improvement as well as a metropolitan one it was the Holborn Viaduct. All the streets going from Snow Hill were very difficult of access, but now they are easy to get at.

If anybody should say that the examples were not fairly selected, evidence was given that a similar experience was found elsewhere in the Metropolis. Mr. F. W. HUNT proved from the rate-books that Whitehall Place, since it ceased to be a *cul-de-sac* by the opening of the Thames Embankment, has not increased in value. Mr. T. B. WESTACOTT supplied official returns of the valuation of a great many houses that might be supposed to have received much benefit from the Kentish Town Road Improvement. We can only give the totals. Houses in Kentish Town Road, which in 1877 were valued at 3,354*l.*, have increased to 3,708*l.*, those in Clarence Road have increased from 543*l.* to 556*l.*, and in Castle Road from 763*l.* to 818*l.* What is remarkable is that a higher valuation was put down after the improvement, but it had to be diminished, and practically the valuation of 1894 corresponds with that of 1877. In many cases where the rate-books show an increase of value, Mr. HUNT offered an explanation which merits attention. He said that "such increase does not in my judgment arise so much from the public improvement as from the remodeling the old premises for a better and more convenient occupation, or their rebuilding, and then the yearly extra value put upon them is only a return upon the new outlay upon the premises rather than caused by the public improvement." Everybody knows that the system of assessment in London is not severely scientific. Perhaps one of the consequences of the adoption of betterment with all its uncertain and remote qualities would be the adoption of a new system of valuation.

Although the new thoroughfares are not found to be very profitable, they often have the effect of diminishing the value of property in their neighbourhoods. Mr. VIGERS says that in Little Earl Street, which was a valuable property before Queen Victoria Street was opened, he has to greatly reduce the rents when granting new leases. He has also found that in the neighbourhood of Charing Cross the business of the small shopkeepers has been destroyed, and some of the tenants have been ruined. In Manchester the experience has been no less remarkable. The Deansgate Improvement was apparently most desirable, for a narrow street was increased to a width of 60 feet. But the sites for new buildings which the Corporation retained were taken up during twenty years very slowly, and some are still vacant. The Corporation price ranged from 24*l.* to 40*l.* a square yard, and the prices realised were 17*l.*, 18*l.* and 20*l.* Mr. SINGTON, an architect who gave particulars, said "that if at the completion of the Deansgate Improvement twenty years ago the land had remained in private hands, and the Corporation had possessed powers to levy a betterment rate, it would have been assessed on an estimated improved value which it is now known has not been realised, and there would not be any means of obtaining an abatement of the rate. If a property owner had at the time compounded for the rate at twenty-eight or thirty-three years' purchase, he would now be a heavy loser." Another case is no less remarkable. In 1873 the plot occupied by the Victoria Buildings was sold by the Corporation for 270,352*l.* It is now covered with buildings which were ingeniously adapted to utilise all the ground. The net rent derived from the property is 7,741*l.*, which is only 1*½* per cent. on the estimated value of the land and buildings, or 482,582*l.* In spite of the improvements which have taken place in Manchester and the numerous buildings erected, the valuation of the township, which was 1,503,000*l.* in 1878, was last year only 1,498,000*l.* These facts suggest how much

injustice can be done by attempting to fix valuations of property at a future period from data which are only applicable to the present. Mr. BRIDGFORD's evidence was corroborative of what takes place in Manchester. He considered that the creation of sites was not enough to excite enterprise, for "where new streets are opened out, and where it is expected enhanced values will accrue to properties that are left, we find almost invariably that unless you can put new buildings on the land which is left, and thereby utilise it, the position is the same after the improvement as it really was before." The surveyor's evidence is, in fact, as strong an argument as could be devised for the necessity of waiting until experience has demonstrated that an "improvement" has made property contiguous to it more valuable, and to a degree that can be equitably assessed.

It should be remembered that indefinite language has had an influence on this subject as on most others. In London and other large towns an improvement is sometimes interpreted as being almost synonymous with the demolition of houses and the construction of wider streets. The operations facilitate traffic, and therefore the new roadway can be considered as an improvement, but it does not follow that the amount of business transacted by the inhabitants is always increased, and unless there is an increase shopkeepers cannot regard the transformation as an improvement. The remarkable fact was pointed out by Mr. TEWSON that for business purposes narrow streets are preferable to wide streets, and he referred to Bond Street as an example. People walking on one side could easily see what was exhibited in shop windows on the opposite side, and the distance to be traversed in crossing was so short, it could be undertaken by timid people. In the neighbouring Regent Street the loss of these advantages was not compensated by width or showiness. In wide streets people also fall into the habit of preferring one side for their perambulations, and when that is the case custom is not equally distributed. It is a favourite practice for some enthusiasts to lay down lines of broad thoroughfares on maps of London, and to revel in the fine scenic effects which would be visible. There is no doubt business would be disarranged and probably diverted into new hands by the alterations, but whether any great advantage would be attained beyond allowing the traffic on wheels to pass quicker is doubtful. Mr. WESTACOTT went so far as to assert, "the wider the street is the worse the trade is for that locality." That, perhaps, may be taken as rather strained if applied universally, but it indicates that gracious promenades are not profitable in proportion to their largeness when compared with streets of another class. Speaking of his own experience in the north-west of London, he was able to say:—"I have known places in my own parish where it has been proposed to widen a street, and where we have widened it, where there was a good trade done beforehand, when the widening had taken place the trade has been sent away to some other locality."

Cases may arise where the enhancement of the value of property in the neighbourhood of a public improvement is manifest, and it is only equitable that special contributions should be asked from the owners. But generally it will be found that the improvement is only problematical. In such cases it would be absurd to act on the opinion of a committee of a town council or their officers. Besides giving the fullest notices of the amount to be claimed and within a reasonable time, the authority should announce a readiness to purchase the property at its market value before the improvements were undertaken. Where the owner prefers to retain his property but demurs to the fairness of the amount charged, we suppose there is no economical way of settling the question. It would have to be settled by arbitration or by a jury, and as going to law with a corporation is a serious affair, probably the majority of people will prefer as the lesser of two evils to submit to the claims. Few who own property are, under the new arrangements, likely to pray that public improvements will approach them.

Mr. C. E. Whitworth, of Birmingham, has been appointed head-master for the School of Art at Newcastle-under-Lyme, in place of the late Mr. J. P. Bacon.

THOMAS YOUNG AND JEAN CHAMPOLLION.

THE modern study of Egyptian archæology has had its origin in two undertakings, which were as unlike in their character as is possible. One was the publication of the catalogue of Egyptian coins in the Borgia collection in Velletri by GEORG ZOËGA, the Jutlander, which appeared in Rome in 1787, and which ten years afterwards was followed by his folio on the obelisks. The other cause was the invasion of Egypt by the French Republican army under BONAPARTE in 1798, and the inquiries he ordered to be undertaken by a commission of savants. The work of the Frenchmen attracted more attention, and scholars attempted to pierce the darkness which had so long rested on Egypt.

At the time when BONAPARTE was telling his troops that forty centuries were looking down on them from the summits of the pyramids, JEAN FRANÇOIS CHAMPOLLION was a boy of eight attending school in Figeac, a town which lies midway between Cahors and Aurillac. An obelisk in it is the fitting memorial of their townsman. When he was seventeen he found his way to Paris, and there, partly from his own inclination and partly on the advice of his elder brother, who was a scholar, he began the study of Eastern languages, Coptic and Egyptian archæology. DENON's fine work on the antiquities had already appeared, and the "Institut du Caire," founded by BONAPARTE, by its communications was aiding to promote that interest in the ancient kingdom which the expedition had excited. Egyptology was fast becoming fashionable, and it was wise to devote CHAMPOLLION to the subject. He resolved to bring out a work descriptive of Egypt under the PHARAOHS as the first-fruits of his studies. As he was not wealthy, he accepted a professorship of history in Grenoble, as well as the post of librarian, in order to obtain a livelihood while his book was in preparation. It appeared in 1814, when the author was in his twenty-fourth year.

The preface contained a remark which was significant, as expressive of the hope which then inspired him. He expressed confidence that the hieroglyphics which were seen on the monuments he described would one day enable the world to realise the sounds of the Egyptian language and understand the thoughts of the people. At that time DR. THOMAS YOUNG, who was one of the ablest men of science in England, was studying the subject. It was known from an early age that some hieroglyphics were symbols, as when a crescent stood for the moon and a circle for the sun. But that was not a sufficient clue to what is seen on the walls and on mummy cases. ZOËGA believed some of them were expressive of the sounds of words. He was not fortunate in realising the value of the Rosetta stone which a French soldier had discovered in 1799. It recorded a decree of PTOLEMY V. in Greek hieroglyphic and demotic characters. YOUNG discerned the relations of the three inscriptions on it. Having found the characters which expressed "Ptolemaios" in Greek, he worked out the phonetic value of the Egyptian signs, which was no easy task, for a hieroglyph sometimes only stood for the first letter of a syllable. That part of the stone was also injured. YOUNG announced his discovery in an article published in 1819, so we may assume it was arrived at earlier. In 1821 CHAMPOLLION opposed the theory and said it was the practice to use certain characters merely as a sort of shorthand for the hieroglyphs, and that the former as well as the latter expressed objects and not sounds.

The incident must have been one of the utmost anxiety for CHAMPOLLION. His whole career seemed to depend on the time-worn stone. He had already suggested that there was some correspondence between Egyptian symbols and sounds. As every scholar does under similar circumstances, CHAMPOLLION supposed the interpretation was a preserve of his own which all men were bound to respect. Without any permission from him, he found an Englishman and a Swede (AKERBLAD) had invaded his property and claimed it as their own. His irritation was seen in his pamphlet of 1821, in which he abandoned, as it were, his own theory, for to say that "L'écriture hiératique" was an abbreviated system of hieroglyphics was to give up phonetics altogether. Fortunately, CHAMPOLLION's love of Egyptology was too strong to allow him to remain perverse.

In September 1822 he was living with his brother in

Paris, and both were daily occupied at the French Institut. One day JEAN came in an excited state to his elder brother, who was in bed, and cast a heap of papers before him, saying he had solved the difficulty. He was scarcely able to give more than a few words of explanation, and then he collapsed. The papers contained an essay on "The alphabet of the phonetic hieroglyphics employed by the Egyptians when inscribing the titles, names and surnames of Greek and Roman sovereigns on the monuments." Two days afterwards (September 17, 1822) it was read before the Academy of Inscriptions and Polite Literature, and was immediately published under the form of a letter to M. DACIER, the secretary. Practically it was a retraction of what CHAMPOLLION had written in his pamphlet of the preceding year about YOUNG's suppositions, but his countrymen were too delighted to trouble themselves about the claims of the English discoverer. CHAMPOLLION was supposed to have created a new Egyptian dynasty that would endure for ever, and consist of French scholars alone.

After the rejoicings were over doubts began to arise, and the subject became an excellent theme for controversy. Dare we say that people were disappointed? A key was found, but the mysteries that were revealed did not seem to be worth either the trouble which was taken to conceal or to find them. Europe had formed its notion of the ancient Egyptians from their works of art, and their buildings seemed to represent a people who aspired after the sublime. In the course of seventy-two years, what has been discovered of thoughts expressed in hieroglyphic or demotic characters which has helped to make the world wiser? Scholars who have laboriously interpreted inscriptions naturally place a very high value on every trifling statement they have revealed. But if to allow experiments in engineering the temples of Egypt were cleared away, would future generations be awed by any composition of the priests or scribes? The authors may have considered their work was superior to the artists'; but that is a prepossession which still remains.

CHAMPOLLION did not attempt such translations as can now be made. He was supposed to have gone far when he made out that his alphabet was applicable to the names of native as well as Greek and Roman rulers in Egypt. All that could be offered to reward research was therefore only barren inscriptions, or parts of them, for some doubted whether CHAMPOLLION was able by his method to translate a whole sentence. The results were therefore not comparable with the free interpretation which fancy could supply with the aid of the hieroglyphics without the assistance of linguistics.

Humble as CHAMPOLLION's discoveries must now appear, they were sufficient to bring him honour. LOUIS XVIII. considered it was a duty to be present when they were discussed. CHARLES X., when his turn arrived to be seated on the French throne, purchased a collection of antiquities at a costly price—they might have been secured for the British Museum—in order that the country should be able to utilise CHAMPOLLION's gifts. Wherever there was a museum with Egyptian remains in it he was invited to give his opinion on them, and his journeys were like royal progresses. Although CHAMPOLLION was described as a Jacobin, who was without respect for the Bible, POPE LEO X. entered into negotiations with him for the production of a noble work on the Roman obelisks, which, however, was never published. Much as he was honoured in Italy, he appears to have been discontented with the routine to which his position was subjected, and he lamented that he was not brought up to a trade. CHAMPOLLION was a nervous man, and may have felt he had accepted a task which was beyond his abilities.

The king having decided that the SALT collection which he had secured was to be placed in the Louvre, CHAMPOLLION was made director. He lost no time in arranging the numerous objects. In order to enrich it he did not hesitate to part with the gifts which he had received from foreign courts, and which were precious as examples of Egyptian art. There was a prejudice against him among academicians, but in compensation he was appointed one of the officers of the royal household.

When CHARLES X. imagined he was competent to take up the archæological work which BONAPARTE was compelled to abandon in Egypt, CHAMPOLLION was placed at

the head of the expedition. The Grand Duke of TUSCANY sent a second party under the control of ROSELLINI. Both arrived at Alexandria in August 1828. The ruler of Egypt, who was MEHEMET ALI, co-operated with them. CHAMPOLLION endeavoured to make the most of his opportunities, which were always liable to come to an end by any trivial error of a diplomatist in Paris. He was indifferent to climatic risks, and when he left Egypt at the end of 1829 his days were numbered. He died of paralysis on March 5, 1832.

France can point to many of her sons who achieved much in a brief period, and JEAN CHAMPOLLION should be included among them. He was a pioneer of Egyptology and his knowledge could not be otherwise than limited. At first he wandered in the mazes of Egyptian history, then he endeavoured to pluck out the heart of the mystery of hieroglyphics, so that up to 1824 he was only a sort of bookman. When he went to Turin he became acquainted for the first time with Egyptian art, and the nine months he spent in Turin formed the earliest period in his career when he was able to obtain an objective education. Afterwards his time was frittered away during four years, and he must have felt a sense of relief when he stood for the first time on Egyptian soil and could pursue his studies satisfactorily. CHAMPOLLION no doubt had the defects of his qualities. As he attained his position by means of books and inscriptions, as if he were a successor to the old scribes, he may be pardoned if he sometimes attempted to interpret papyrus records by courageous guessing. The great people around him would consider him an impostor if he hesitated to explain anything Egyptian. CHAMPOLLION, like many of his contemporaries, was a victim to the circumstances of the time. Among his incomplete works are the "Egyptian Pantheon" and the "Monuments of Egypt and Nubia," which are evidence of his courage.

There was no distinction awaiting THOMAS YOUNG in England for having shown the way to CHAMPOLLION and others. His occupations were so varied and his talents so versatile, none of his countrymen would be surprised if he wrote a treatise on the music of the spheres as well as on Egyptian hieroglyphics. At the time he announced his discovery he was editor of the *Nautical Almanac*, and as his calculations were criticised by men who were not familiar with astronomy, we suppose, as a philosopher, he was thankful that his interpretation of the Rosetta stone was disregarded. YOUNG eked out a living in several ways, but as he was wanting in assurance he was not thought to be successful in any of them. His fate was a striking contrast to CHAMPOLLION'S, but if the two men could have changed countries probably the contrast would be still more remarkable.

THE FRESCOES OF PINTURICCHIO.

THAT part of the Vatican which still bears the sinister name of Borgia, says the *Weekly Register*, was the dwelling-place of Alexander VI. It is a relatively small set of apartments, comprising six rooms, but its frescoes have made it famous. They are Pinturicchio's best work, and have kept all the sharp brightness of colour which Pinturicchio's paints always possessed and are upon the vaultings of the ceilings. As it was unusual to paint the ceilings so elaborately and not the walls at all, the presence of frescoes on the sides of these noble halls has often been suspected. It has not been the manner of the gorgeous pontiffs to cover over works of art, but it was surmised that the successors of Alexander VI. might not improbably have found something in the frescoes rather too little austere for the rooms of a pontiff. This age, however, is undaunted in the pursuit of art or archaeology, and it was recently resolved that, be the discoveries what they might, the surface colour should be removed. First it was necessary to clear the principal room of some thousands of books; next, the tiled flooring was completely restored, and then the walls were scraped. Several thicknesses of colour wash were found, and soon the presence of designs and colours was made manifest. The search party were cheered, moreover, by the discovery that neither designs nor colours were of a nature to shock the most sensitive feelings—not even those of the *Figaro*. An emissary from that sprightly paper penetrated a few days ago into the Sala Borgia, and had the happiness of ascertaining that its frescoes were every way better than its name. They are, so far, only partly uncovered, the work being necessarily one of difficulty and time, but there seems to be no doubt amongst experts that they are from the hand of Pinturicchio. In the first room, called the Hall of the

Pontiffs, from the names of three or four popes inscribed upon the vault, the artist entrusted with the labour—M. Seitz—has restored to the light of day a series of comparatively small landscape subjects, enclosed in panel frames which have greatly suffered. Nor are the paintings all. Between the framings are caryatides of great height and beauty, the work of Pierino del Vaga and of Giovanni d'Udine. The second room, Sala della Madonna, proves to be painted throughout by Pinturicchio. The scheme of decoration is superb. All round beneath vaulting runs a decorative frieze of brilliant colours. The walls simulate a hanging of tissue covered with capricious golden arabesques, the lower parts being painted—in a taste more worthy of modern Italy—with an illusion of furniture, cabinets with half-opened drawers showing their contents and bearing chalices, candelabra, censers. The third hall—Sala dei Santi—is painted with an imitation of tapestry. The painting of the fourth has greatly suffered, its walls having been excavated for the fastening up of bas-reliefs and lapidary inscriptions. These naturally made very short work of the unsuspected frescoes. The fifth and sixth rooms have fared almost as ill, but in the embrasures of the windows some traces of fine design have been uncovered. All those persons to whom the word restoration is more maddening than is the matador's mantle to the bull—and they are right to feel it in that way—will be appeased to hear that his holiness has given stringent orders that nothing but uncovering is to be attempted in any single instance. The Pope has besides full confidence in the discretion and skill of M. Seitz, whom he visited last week at his work and congratulated on its progress. "I hope," said the holy father, "that you will be able to finish this important labour so that by the end of next year the public will be able to admire the Vatican frescoes of Pinturicchio as they do now the Vatican frescoes of Raphael."

BIRMINGHAM AND MIDLAND INSTITUTE.

THE members of the Archaeological Section have just made the last excursion of the season into Cheshire. The party drove to Moreton Old Hall, where a rich treat met the eye of the antiquarian. This is, perhaps, the largest half-timbered building in the kingdom. It occupies three sides of a square, the fourth side being a garden, and the whole being surrounded by a moat, now crossed by a stone bridge, but in earlier times, no doubt, by a drawbridge. It was gratifying to observe the care which has been taken to prop up and preserve this interesting building. A pleasant drive brought the party to the large and handsome church at Astbury, where they were met by Mr. Lynam, who has made a special study of it, and explained its interesting features. On reaching Congleton, the party were received at the Town Hall by Mr. Head and the town clerk (Mr. A. S. Sheldon), who kindly exhibited and explained some fine charters, the Cromwellian mace (a very fine specimen), the signature of Bradshaw the Regicide (once mayor), and three belts, bearing bells, once used by acolytes, who ran round the town on the feast day of the local saint.

BERWICKSHIRE NATURALISTS' CLUB.

THIS club has just held its fifth and last field meeting for the season at Gordon, under the guidance of the Rev. Thomas Porteous, Gordon. On arriving at Mellerstain the mausoleum of the Baillie family was examined, and the grave viewed of the famous Lady Grissel Baillie, daughter of Sir Patrick Hume, of Polwarth. It was this lady who heroically found means of conveying food to her father while he was concealed in the vault of Polwarth Kirk in the persecuting times. Mellerstain House was afterwards inspected, and the family portraits which adorn its rooms. The party also walked through the grounds and gardens.

MANCHESTER AUTUMN EXHIBITION.

THIS year's exhibition of paintings in the Manchester Corporation Art Gallery comprises a much smaller number of works than has been seen in the rooms in Mosley Street on some previous occasions, the reason apparently being that the authorities decided to interfere as little as possible with the growing claims of the permanent collections in the same building to uninterrupted free access of the public throughout the year. The limitation of the number of works in the autumn exhibition has not, however, sufficed to prevent some regrettable instances of "skying." Perhaps the dissatisfaction annually felt at the results of attempting to combine in the same building (the old Royal Institution) a permanent gallery of art and an annual representation of the art of the year, will lead before long to the provision of accommodation for the latter on some site not necessarily so central, but better fitted in other respects for the due display of paintings and sculpture. In the meantime, the hopes of the munificent donors of the property, who

presented their fine building by Sir C. Barry, with its contents, to the city Corporation twelve years ago, can be but partially fulfilled, since the more the permanent collection prospers, the less chance there is of the temporary collection being adequate to its purpose. This year's exhibition includes pictures by Sir F. Leighton, Messrs. G. F. Watts, Aumonier, East, North, Hacker, Shannon, Hemy, D. Murray, Goodall, Poynter, Leshe, Moore, Brett and other distinguished contributors.

TESSERÆ.

Varieties of Spires.

A GRADUAL and progressive transition from the mere peak or pyramidal roof to the slender tapering spire cannot be clearly traced. On the contrary, some of the earliest deviations from the simple pyramidal form appear to have produced uncouthness rather than lightness; for although much greater loftiness upon the whole was so occasioned, the appearance of it was reduced by the sides of the tower being made to terminate in gables cutting into, and therefore partly cutting off, the base of the pyramid or spire itself. Many of the earlier German edifices contain examples of this peculiarity—one almost confined to them; among others the cathedrals of Worms and Gelnhausen, the church at Andernach and that of the Apostles at Cologne exhibit many varieties of spires, or rather spire roofs, springing up from gables at their base, and in some the gables are so large and rise up so high that the appearance of spire is almost entirely lost. Such is the case with the pyramidal covering of the square tower at the west end of the church at Gelnhausen, of which the portion above the gable forms a mere capping. The same church offers other specimens of the kind, there being besides the one mentioned a spire over the intersection of the transept, one over the apse at the east end and two others over the towers adjoining it. All these are polygonal, but otherwise differ, except that those to the towers are similar to each other, both in dimensions and proportion—that over the apse being not quite so high as it is broad, while that over the transept is one diameter and a half and the two others three diameters in height. They are all gabled at the base, and their ridges correspond with the apices of the gables, so that the sides or faces of the spire alternate with those of the tower, which last circumstance is almost peculiar to the earliest German spires. Another distinction belonging to them is that, except gables or pediments, they have nothing at their base—neither parapet nor pinnacles of any kind, which would serve at once as a finish to the tower and as enrichment to the lower part of the spire. This is so different from the usual mode that in this country a spire set immediately upon a tower without any parapet, &c., at its base is technically described by the term broach.

The Greek "Running Path."

The stadium consisted of a flat area, surrounded by raised seats, and was made either in a spot which had by nature the required shape, or in the side of a hill or on a plane. In the last two cases the stadium was constructed by forming a mound of earth of the proper shape and covering it with stone or marble for the seats. The second of these three forms was the most common. Of the third we have a fine example in the Panathenaic stadium at Athens. The area of the stadium was oblong, terminating at one end in a semicircle. At the other end it was bounded by a wall, at the two extremities of which were the entrances, one on each side of the stadium. Here was the starting-place marked by a square pillar in the middle of the breadth of the area. Another such pillar was placed at the other end of the course, at the distance of a stadium from the former, and at or near the centre of the semicircular end of the area. This pillar marked the termination of the simple foot-race, but in the Diaulus the runners turned round it and went back to the starting-place; in the Dolichus they turned round both pillars several times, according to the number of stadia of which the course consisted. The end of the course was also marked by a pillar. Halfway between these pillars stood a third. On the pillar at the starting-place was inscribed the word "Excel," on the middle one "Hasten," on the one at the goal "Turn." The semicircular end of the area was thus not used in the foot-race. Here probably the other gymnastic contests took place, for though the stadium was originally intended only for the foot-race, yet as the other contests came to be added to the games they also took place in the stadium, except the horse-races, for which a separate course was set apart, shaped like the stadium, but larger. Among the seats which surrounded the area a conspicuous place, opposite to the goal, was set apart for the three Hellanodica, who decided the contests, and who entered the stadium by a secret passage. Opposite to them, on the other side of the stadium, was an altar, on which the priestesses of Demeter Chamyne sat to view the games. The area was ornamented with several altars and

statues. The position of the stadium was sometimes, but not always, in connection with the gymnasium. Under the Romans many of the Grecian stadia were modified so as to resemble the amphitheatre. There still exist considerable ruins of stadia, among the most remarkable of which are those at Delphi, Athens, Messene, Ephesus and Laodicea.

English Oak.

The species of oak known as *Quercus pedunculata* has the reputation of being the true British oak. The timber of the oak, like all other wood, is materially affected by the nature of the soil in which it grows, and this has probably given rise to the often repeated assertion that Sussex oak, which chiefly consists of *Q. pedunculata*, was the best that could be employed in shipbuilding. Experiments as to strength and toughness have shown that there is no material difference between it and *Q. sessiliflora* in those respects, and the durability of the wood of the sessile-cupped oak is attested by the well-known fact that the roof of Westminster Hall is constructed of it, and not of chestnut, as has been sometimes said. It has been found to be the timber of some of the most ancient buildings in this country and elsewhere. An immense beam in an old Shropshire building, called Stone House, was *Q. sessiliflora*, and the oak usually obtained from bogs, where it must have lain for centuries, has often proved to be the same. The wood may be easily known by its medullary rays, or silver grain, being so far apart that it cannot be rent, and this gives it quite a peculiar aspect. *Q. sessiliflora* is found all over England now, but nowhere in much quantity. It, however, is more abundant in the West than elsewhere, and constitutes the greater part of the oak of North Wales. It is a much handsomer plant than *Q. pedunculata*, and grows considerably faster, and therefore is by far the most advantageous kind for the planter. Its comparative scarcity at the present day may perhaps have arisen from its having been felled in preference as long as any of it remained in the ancient forests, which its superiority in size to the other species would render probable, and not having been replaced, it would thus become gradually exterminated. It appears to be still common over all the south of Europe, where, however, it is not uncommonly mistaken for the last.

Heidelberg Castle.

The Elector Frederick V. was born in 1596, and succeeded his father in 1610. In 1613 he married the Princess Elizabeth, daughter of James I. king of England, she being the same age as himself. In 1614, having attained his majority, he took upon himself the government of his palatine territories. In 1619, being looked upon as the head of the Protestant cause, he was elected King of Bohemia, and in November that year he, with his wife and a numerous suite, left his capital and palace at Heidelberg for Prague, there to accept the proffered crown, and assume the state of King of Bohemia. He was destined never to return to his former home. He was very fond of splendour, and through his great passion for building during his short reign from 1614 to 1619, he carried the beautiful castle palace of Heidelberg to its greatest extent of magnificence. In December 1619 he and his wife were crowned king and queen of Bohemia; but early in 1620 he was besieged and defeated at Prague, and obliged to fly with the queen and family and a few friends, and they were both fugitives and sojourners in strange lands for the remainder of their lives, for he was put under the ban of the empire, and in 1623 deprived of his hereditary possessions. The castle had been founded at an early period, but the Elector Lewis V., who reigned from 1508 to 1544, made great additions to it, amongst which he raised that portion of the fortifications called afterwards the Stüchgarten, and built at the north-west corner the so-called Big Tower. His brother Frederick II. (1544-56) also made additions, building at the north-east corner the Octagon Tower on an earlier circular base. His successor, Otto Heinrich (1556-59), erected the beautiful buildings which go by his name. John Casimir (1583-93) caused the first great tun to be made in 1591, and erected the building to contain it. Frederick IV. (1593-1610) added greatly to the castle, erecting the Frederick buildings with the terrace in front, the upper storeys of the Octagon Tower, the Library Tower and the (now called) Blown-up Tower. Frederick V. between 1614 and 1619 carried the structure to its greatest extent of splendour. He employed Von Caus, the architect to the king of France, to lay out the royal gardens. By the architect, Charles of Nuremberg, he raised the Big Tower, building on the top of it a large circular saloon. He erected on the north rampart the English buildings, as the lodgings for his English bride, and the ruins retain the name to this day. He transformed the old chapel, which occupied a portion of the castle called the Rupert building, into the royal hall, the chapel having been removed into the Frederick buildings. He substituted a platform with a balustrade for the high roof of the building where the tun was kept, and connected them all with the English buildings. He filled up the round bastion, substituting a handsome balustrade

for the parapets of the Stüchgarten, at the extremity of which he built the aviary and the Elizabeth Gate, so called in honour of his wife. He joined what was called the small garden with what was called the Süchgarten, connecting them with the English buildings by a drawbridge. These works were all but completed by 1619, when he and his court went to Prague, and the Thirty Years' War put a stop to all further proceedings.

Flaxman on Romney.

The following are extracts from Flaxman's character of the works and genius of Romney:—"When Romney first began to paint he had seen no gallery of pictures, nor the fine productions of ancient sculpture; but then women and children were his statues, and all objects under the cope of heaven formed his school of painting." "His genius bore a strong resemblance to the scenes he was born in; like them it partook of the grand and beautiful, and like them also the bright sunshine and enchanting prospects of his fancy were occasionally overspread with mist and gloom." "Few painters have left so many examples in their works of the tender and delicate affections, and several of his pictures breathe a kindred spirit with the *Sigismonda* of Correggio. His cartoons, some of which have unfortunately perished, were examples of the sublime and terrible; at that time perfectly new in English art." "His compositions, like those of the ancient pictures and basso-relievos, told their story by a single group of figures in the front; whilst the background is made the simplest possible, rejecting all unnecessary episode and trivial ornament, either of secondary groups or architectural subdivision. In his compositions the beholder was forcibly struck by the sentiment at the first glance, the gradations and varieties of which he traced through several characters, all conceived in an elevated spirit of dignity and beauty, with a lively expression of nature in all the parts. His heads were various; the male were decided and grand, the female lovely; his figures resembled the antique; the limbs were elegant and finely formed; his drapery was well understood." "Few artists since the fifteenth century have been able to do so much in so many different branches."

Transformations of Statues.

The ancient gods and spiritual beings when represented by the artists become personified abstractions, which in order to be at once recognised must perpetually retain their appropriate characteristics. In the eyes of the sculptor Venus is only "Love." He must therefore attribute to her all the modest, bashful beauty, all the graceful charm, which are the attraction of a beloved object, and which therefore are included in the abstract idea of love. If there is the least deviation from the idea we can no longer recognise her form. Beauty, but clothed with majesty rather than bashfulness, becomes at once not a Venus, but a Juno. Charms, but charms commanding and rather manly than graceful, give us, instead of a Venus, a Minerva. It is no wonder, therefore, that the story by Pliny, in which he relates how Agoracritus, on being vanquished in the contest for the prize with Alcamenes, changed his Venus into a Nemesis, has been a subject of difficulty to several critics and commentators on Pliny. It was not easily understood how, by a slight change, he could convert a Venus into the terrible goddess Nemesis. Sillig, in his remarks on the subject, says:—"It appears certain that Agoracritus made a statue of Venus, and, mortified to find it deemed inferior to that of Alcamenes, made some slight alteration in it, and sold it to the people of Rhamnus. Many learned men, indeed, have doubted whether a statue of Venus could be modified so as to represent a Nemesis, and they have hence inferred that this part of the narrative of Pliny is fictitious, but in adopting this conclusion they seem to have acted inconsiderately. For they have supposed that the Nemesis Rhamnusia was similar to the statues which now remain, having the arm half raised so as to form an angle, and the robe partly withdrawn from the breast so as to expose it to view, but this opinion has been by some successfully called in question. They have, however, committed a still more serious error in not attending to the difference between the statues of Venus formed in different ages. It would be indeed absurd to suppose that the Venus of Praxiteles, of which the Venus de' Medici is commonly supposed to be a copy, could be transformed into a Nemesis. But who is not aware that, in the earlier times of Greece, the statues of all gods and goddesses were very similar, and that goddesses in particular were at the first far less distinguished by the difference of their persons than by their different external appendages? Thus the Venus of Agoracritus must have been exhibited with a certain peculiar dress which would strike the beholders, and as there was not a marked difference between the faces of the two goddesses, the artist had only to alter the dress and the other external appendages according to the ancient mythology. These appendages Pausanias accurately describes, but without explaining their mythical meaning, so that it is impossible to ascertain the reference of many of them. We know also, from many vestiges left on statues still extant, that ancient marble statues were frequently adorned with gold and silver bracelets, earrings,

garlands, goblets and similar ornaments, so that Agoracritus, in transforming his Venus into a Nemesis, had only to change the golden decorations." The story is curious, but Pausanias gives a different account of the origin of the Rhamnian Nemesis. He says:—"The Medes, never dreaming that any obstacle would stand between them and the capture of Athens, brought to Marathon a block of Parian marble to make a trophy of. This block Phidias worked up into a statue of Nemesis. On the head of the goddess is a crown, having on it stags and small figures of Niké; one hand holds the bough of an apple tree, and the other, or right hand, holds a bowl, on which are figured Æthiopians. What is meant by these Æthiopians I can neither conjecture myself nor can I admit the opinion of those who profess to understand it, and who say that the reason of their being figured on the bowl has to do with the river Oceanus, for it is by that river the Æthiopians dwell, and they add that Oceanus is the father of Nemesis." Zoega may or may not be justified in throwing discredit on the story of the block of marble, and, indeed, the divergence between Pausanias and Pliny seems to show that very little reliance can be placed on either of them in the matter of this statue. Figures of Nemesis holding the apple-bough, as stated by Pausanias, are not unfrequently found on ancient remains, as, for example, on the Chigi Vase. A fragment of a colossal head, presumed to be that of the goddess, was found at Rhamnus, and is preserved in the British Museum; it still shows the holes for fixing a metal crown.

The Function of Painting and Sculpture.

In times that are now long past it was often the province of the painter's art to teach facts as well as to create emotion towards beauty. There was then a scope for much elaborate art to be painted in order that an illiterate public should learn history and religion, and be impressed by notable passing events. But those times are over. Now photography and cheap engravings portray and endlessly repeat scenes of passing interest, and can procure for thousands the likeness of any place or person of public interest. Besides, every kind of literature is within everyone's reach, that describes in words the feelings and facts of life. Now, art should maintain her highest level or cease to expect a distinct place in the world's growing and better interests. Science will probably soon discover a means of photographing colour, and then the realistic school of art, which aims only at giving the outward aspect of an object artistically arranged, without any reflection of the artist's nature, will be completely beaten on its own ground. But that art which emanates from a poetic preference—the highest art, in fact, painted and sculptured poetry—will not only retain the interest which it always has inspired, but will be more distinctly recognised as belonging to the same class of intellectual interests as do the best writings in prose and poetry, and will be recognised as demanding the same class of emotional response as that which the best music excites. If the mass of so-called art yearly produced on semi-manufacturing principles ever settles down into its right place, a greater lucidity in the mind of the public as to what makes art might be hoped for. The general intellectual world might learn perhaps how mistaken it is to demand even from the highest art that it should feed the intellect without first touching the emotional qualities and inspiring a satisfaction in true beauty of line and colour; and, on the other hand, the so-called artistic world might well cease from demanding and desiring solely that a limited kind of emotional pleasure should be excited by art, without insisting that such emotion should lead to a satisfaction also of the intellectual and higher faculties. If such a reform in art feeling ever came about, then painted and sculptured poetry would probably be recognised as the art which alone justified the immense and difficult toil which any painting and sculpture of a really finished and complete character necessitates.

Setting Out Ornament.

All schemes of ornament should be set out on a geometrical basis. As a rule floral ornament on the same plane should spring from one root or from two roots, one on each side of the centre. For superposed ornament on two planes the lower pattern should be small and form a ground for the upper one, which should be larger and stiffer, as in the text work of the Saracens; if a third plane is superposed a geometrical pattern is the best. Ornament should be strictly confined to the spaces enclosed by the structural lines. The examples of plates where one pattern runs over the bottom bevel and edge are to be avoided. In the case of curved forms each ornament should be confined to such part of the curved surface as will not cause its distortion. Where ornate friezes, bands or panels are used to ornament portions of one large surface the intervening parts should be plain or covered by simple forms in the shape of spotting, powdering, lining, striping or matted work and should not distract attention from the main ornament. In certain cases this effect has been attained by making the ornament of the subsidiary parts in such low relief that it appears at a distance a mere roughening of the surface.

NOTES AND COMMENTS

THE present is hardly an opportune time to be exacting in asserting rights to property in ancient remains which do not stand in private demesnes. An action of that kind usually compels sceptics to inquire into the origin of property in landed estates, and they conclude that the titles to them are as shadowy as those relating to examples of art which have not a market value. How can a substantial claim to the ownership of the preaching cross in the High Street of Leighton Buzzard be made out? It was restored in 1620 by money to which all the people were obliged to contribute; and for a still longer period, probably from the reign of EDWARD III., it was considered to be public property. As late as 1852 it was again restored by subscription. The cross is surrounded by a palisade, and the keys of the gate are held by the local Public Lands Trustees. Yet the lord of the manor claims the ownership of it, and it has been included as part of an estate that was offered for sale on Tuesday. Manorial rights are relics of feudalism, and in many cases they cause no inconvenience to the people of the district. Sometimes the authority they confer is held out as a threat, as when it is proposed to demolish a church in order to punish a parson. But happily it is almost without precedent to have a claim set up like the one which is causing commotion in Leighton Buzzard.

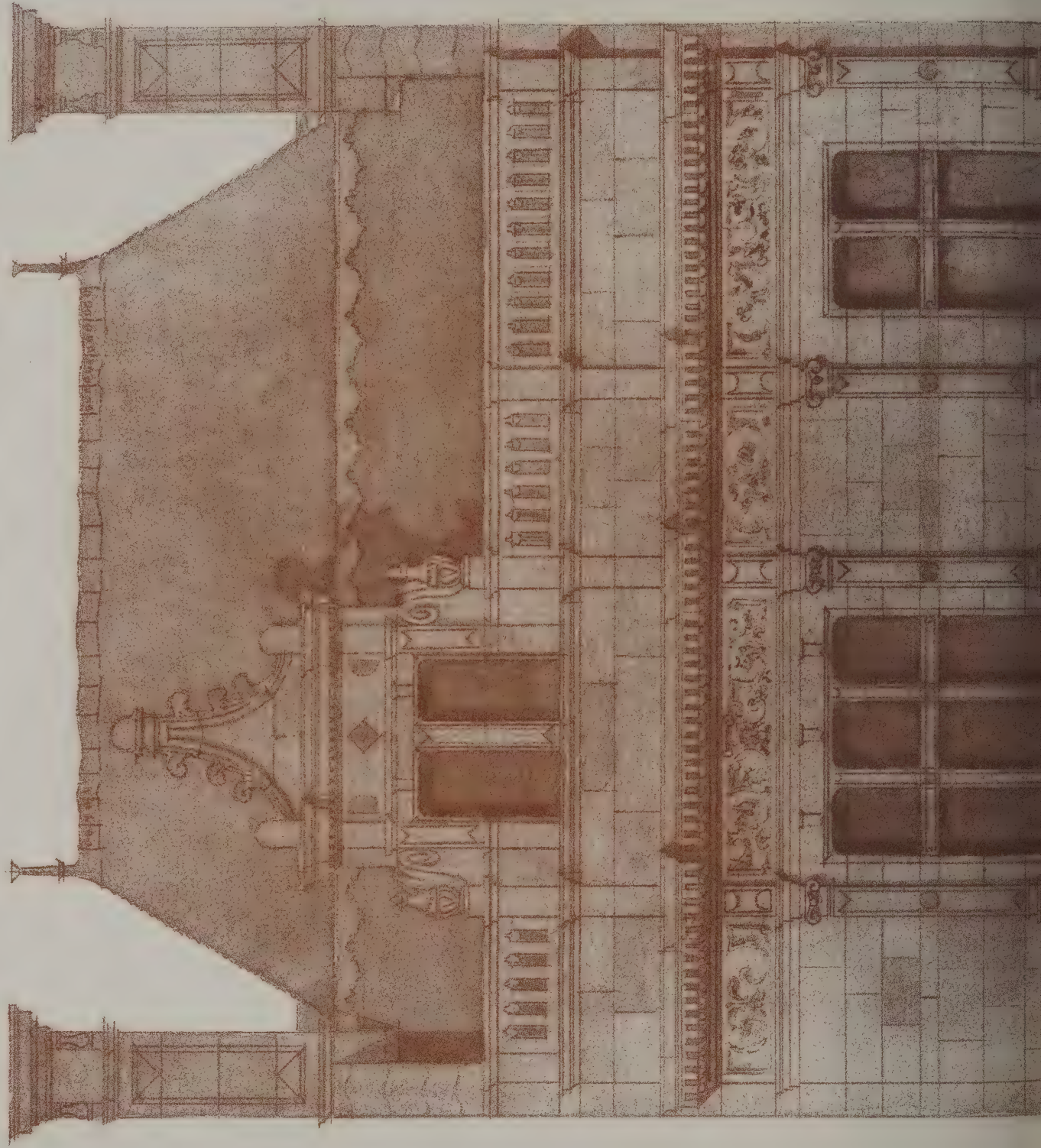
THE age of the purple tissue which is supposed to have belonged to CHARLEMAGNE and forms part of the treasure of Aix-la-Chapelle has been the subject of many a stiff controversy among German archaeologists. The qualities of the material are believed with equal confidence to belong to ages that are centuries apart. As a sort of compromise the tissue is generally supposed to have been woven in the twelfth century. As the great emperor died in 814, it could not have added much to the dignity of his appearance, nor did a man who was so majestic in appearance require an aid of that kind. An investigation of the subject was lately undertaken by Dr. BORK, who has announced his conclusions for the benefit of the Bavarian Union of Art industries. The inscription on the tissue records that it was carried out in the Zeuxippos or imperial factory of Byzantium under the direction of MICHAEL the superintendent. The factory it appears contained several departments, which were all occupied in preparing the robes and other paraphernalia of royalty. Dr. BORK concludes that the piece in Aix-la-Chapelle was produced between 1180 and 1210 or thereabouts. As it may have been used as a pall at one of the anniversary services for the peace of the emperor's soul, it is easy to understand how in course of time it was supposed to have belonged to CHARLEMAGNE and to be worn by him.

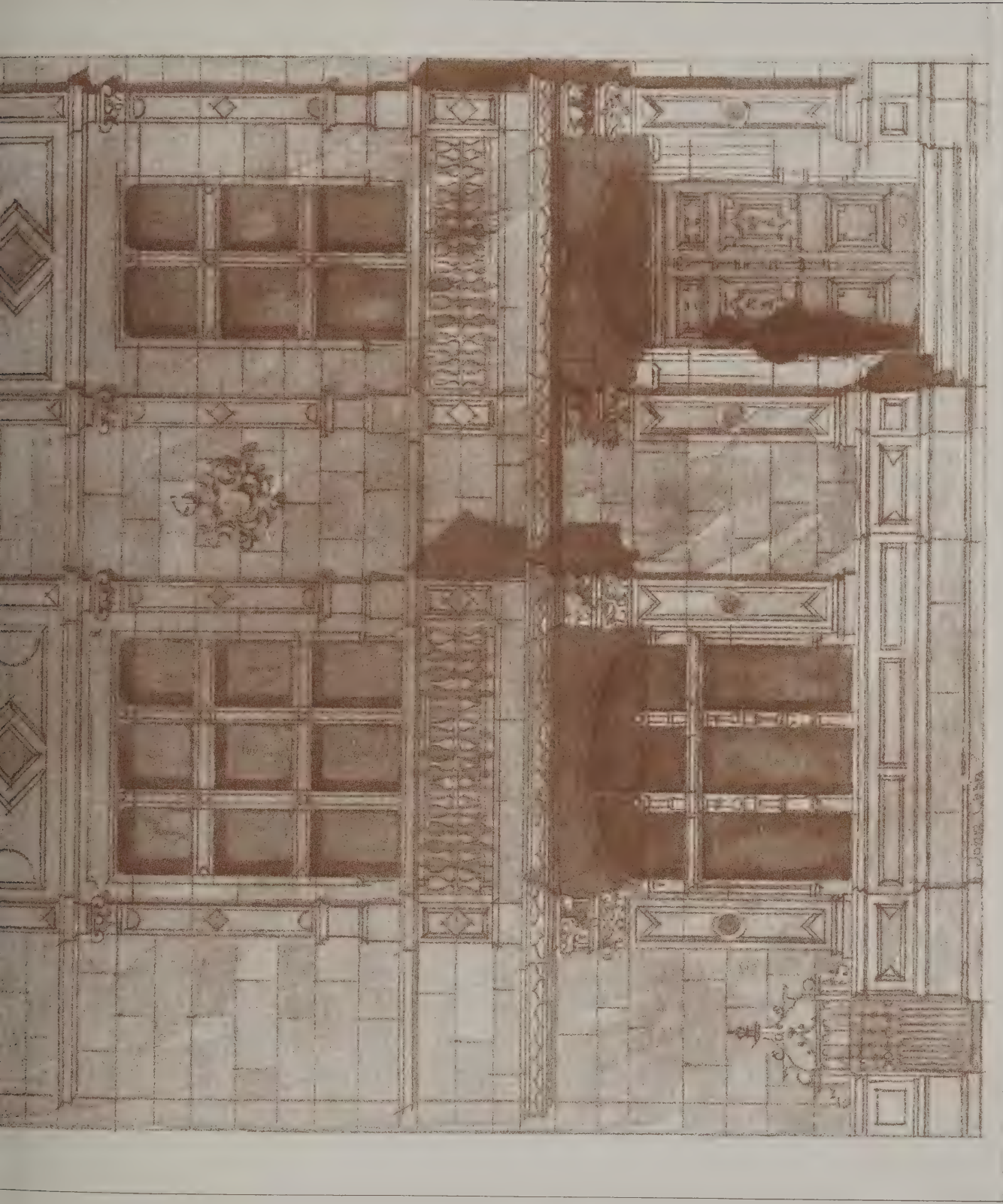
If in England we are providentially preserved from earthquakes, there is a very disagreeable substitute in the subsidences due to mining. A Japanese would be not unlikely to say he preferred to live in Yokohama or Tokyo than in Motherwell or Northwich, for with lattice-work houses there is less risk than with those of stone and brick. In the Scottish town, after a brief cessation, the disturbances appear to have recommenced with vigour. The *Glasgow Herald* gives the following description of the present state of one of the tenement houses:—"The walls at the front of the building are rent from top to bottom, the fissures being large enough to admit a man's hand. The wooden supports which have been placed in the windows are twisted and bent under the strain of the yielding structure, whilst the window sashes are jammed and immovable. Props have been placed to support the gable wall, but it is visibly off the plumb, and it has been found necessary to erect a barricade round that part of the building, as there is a probability of the whole structure collapsing, and thus endangering the lives of the public. Bad as the buildings appear on the outside, the interior is infinitely worse. The ceilings are almost entirely without plaster, a condition of things which has existed for some time; and to prevent the occupants from being injured by the falling ceilings the proprietor has had to fix lengths of cloth along the rafters, in which hang suspended large pieces of plaster, which might otherwise have caused injury or inconvenience to the

householders. The walls of all the houses are likewise in a deplorable condition, there being hardly a yard without a rent or a fissure. An idea of the conditions under which the tenants have had to live may be got from the fact that the cracks in the walls are so large that one tenant can look through into his neighbour's house. In one instance a tenant proceeded to fill up one of these fissures in the wall of his house, and the plaster went right through into his next-door neighbour's bed." It may be added that the building has only recently come into the possession of the proprietor. In Northwich three cottages collapsed last week, as well as a large pumping-station, "a valuable pumping-engine and a quantity of materials disappearing in a chasm 40 feet in diameter and some 20 feet deep." In the salt district there may be some excuse for building houses in a dangerous position, for the subsidences often arise from causes which are remote. But from the evidence which was given lately before a Parliamentary committee, it is plain that in Motherwell, owing to the stringency of the feuing regulations, the people have no choice, and are compelled to live within a limited and unsafe area.

It may not be known generally that a selection of electrotype reproductions of all the finest Greek and Roman coins in the British Museum has been placed on exhibition in the Etruscan saloon, on either side of the entrance to the new Medal-room. The Greek coins, on the south side of the entrance, have been arranged in such a manner as to afford a synoptical view, at once historical and geographical, of the gold and silver coinage of the ancient world, from the invention of the art of coining money, early in the seventh century B.C., down to the Christian era. Every specimen exhibited has been separately labelled and numbered in accordance with the "Guide to the Coins of the Ancients," where full descriptions and explanations of the types are given. The Roman coins, on the north side of the entrance, consist (1) of a rich series of Roman and Byzantine aurei and solidi, ranging from the time of JULIUS CÆSAR down to the fall of Constantinople in A.D. 1453; (2) of a series of silver denarii, &c., of Republican times, classified alphabetically under the Gentile or family names of the monetarii, the dates of issue being added on the labels under the specimens; (3) of a selection of *Aes grave*, showing the successive reductions of the Roman *As* and its divisions in chronological order; and (4) a representative portrait-series of Roman Imperial large brass coins and medallions, comprising the finest specimens from the unrivalled collection of the late Mr. EDWARD WIGAN.

A BIOGRAPHY of GAINSBOROUGH by Mr. W. ARMSTRONG has been added to the *Portfolio* series. The author divides the artist's career into three sections corresponding with his residence in Suffolk, Bath and London. GAINSBOROUGH was one of the self-taught painters, for the instruction he received from HAYMAN was not of much avail, and it is amazing that he was able to make such strides in art at an early date. A letter he wrote to a patron who complained of his handling suggests the scarcity of examples with which he was acquainted. "I don't think," he wrote, "it would be more ridiculous for a person to put his nose close to the canvas and say the colours smelt offensive than to say how rough the paint lies, for one is just as material as the other with regard to hurting the effect and drawing of a picture. Sir GODFREY used to tell them that pictures were not made to smell at; and what made his pictures more valuable than others with the connoisseurs was the pencil or touch." A modern student would be able under similar circumstances to adduce the handling of a variety of masters. GAINSBOROUGH, when repeating the story, was not able to say he had seen a painting of KNELLER'S. Half his life was spent before he was able to study VANDYKE'S treatment. Mr. ARMSTRONG says with truth, "GAINSBOROUGH was a rarer genius than VANDYCK. His art is more personal, more exquisite, more alive with temperament than the Flemings;" but there is no doubt that "when VANDYKE first swam into his ken," a new era was open for the art of GAINSBOROUGH. As is usual, the monograph is illustrated with as fine reproductions as photography can give.



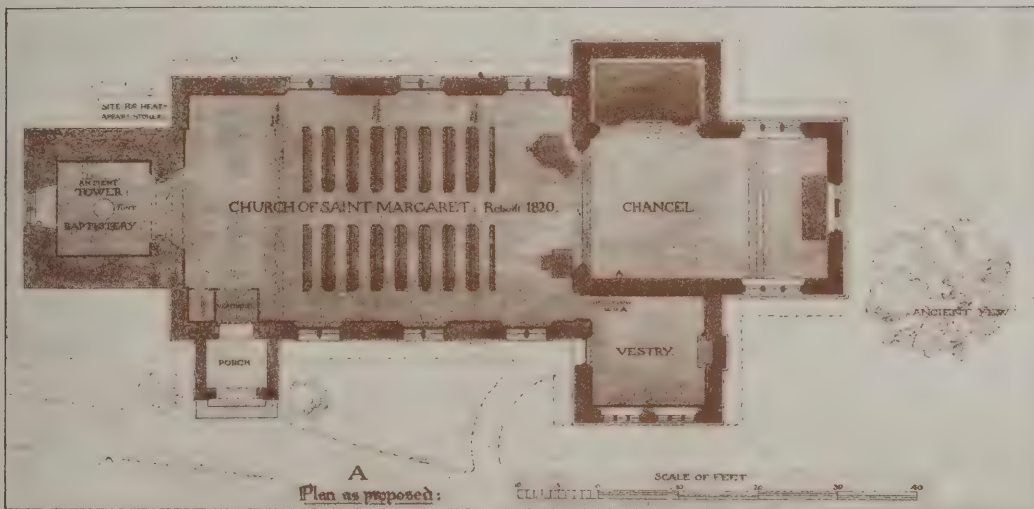


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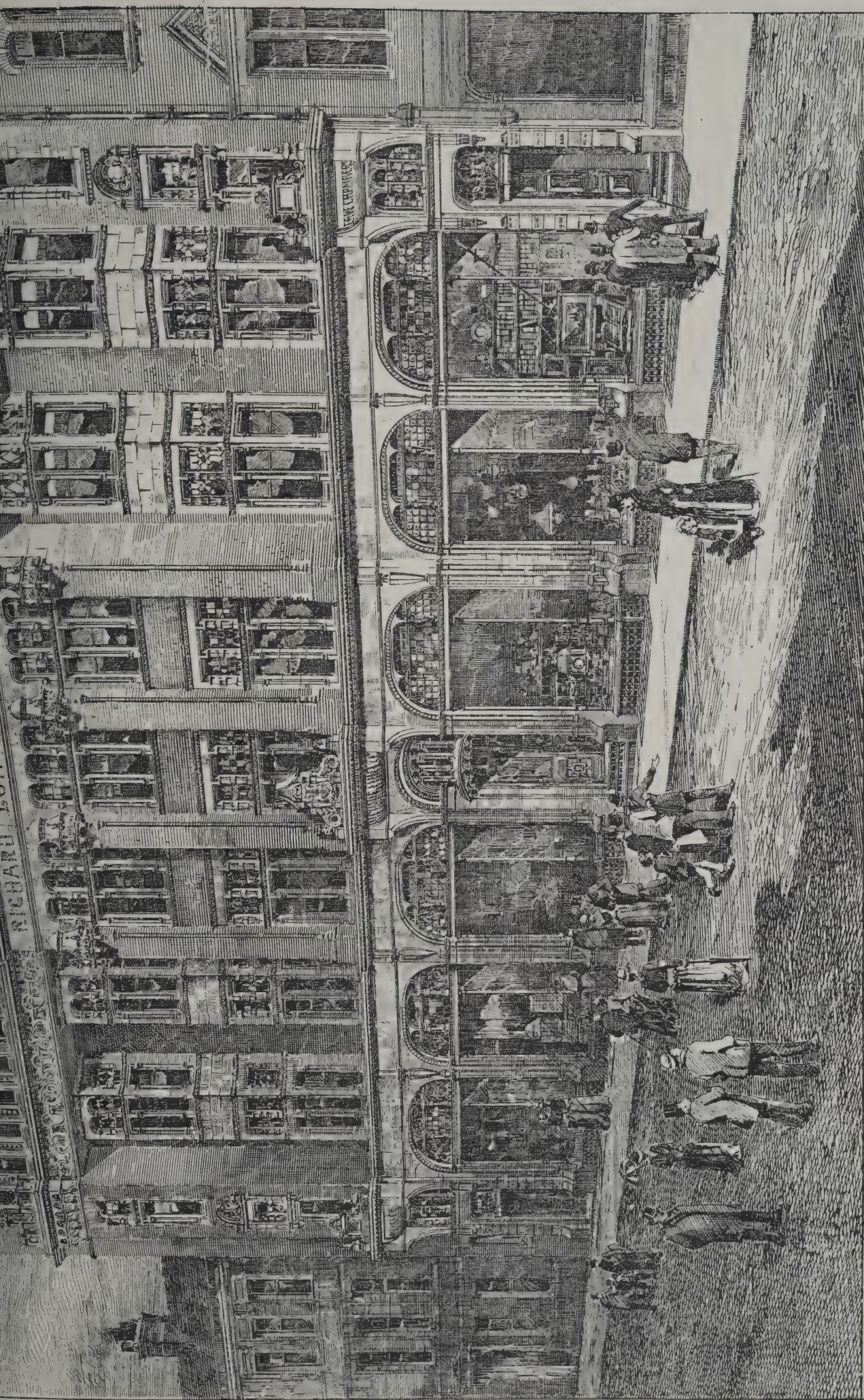
A STREET HOUSE.
JOHN CASH Architect.



FETTER HURCH
NORTH STAFFORDS







NEW PREMISES, OLD SQUARE BIRMINGHAM, FOR RICHARD LUNT & CO. LIMITED. *ESSEX, NICOL & GOODMAN, ARCHITECTS, 8 NEWHALL STREET, BIRMINGHAM.*

Printed by Spangier & Co. 44 & 45, East Harding Street, Finsbury Lane, E.C.

ILLUSTRATIONS.

NEW PREMISES, OLD SQUARE, BIRMINGHAM.

AMONG our illustrations this week is a perspective view of the front elevation of the new premises now in course of erection for Messrs. LUNT & Co., warehousemen and haberdashers, who will shortly be removing from their existing buildings in Moor Street, their premises being required in connection with the extensive railway alterations in that district. The new premises will consist of extensive warehouses in the rear, five storeys in height, with a block of shops and offices in the front. The front elevation will have Burmantofts buff terra-cotta dressings, with EDWARDS'S Ruabon red facing-bricks. The work is being carried out by Mr. JOHN BOWEN, of Balsall Heath, Birmingham, from designs and under the superintendence of Messrs. ESSEX, NICOL & GOODMAN, architects, 8 Newhall Street.

A STREET HOUSE.

THIS illustration is a reproduction of a design by Mr. JOHN CASH, of Willesden, which was exhibited this year at the Royal Academy.

WETTON CHURCH.

THE new chancel and choir, &c., shown in the design we publish, has not yet been erected, owing to deficiency of funds, but other works have been carried out, and the reopening took place recently. The body of the church (a large nave without aisles, "churchwardens' Gothic," temp. 1822) was dilapidated, and the walls had to be lowered and a substantial open-timbered roof erected. New flooring of plain bright red tiles and wood has also been laid. New benching has been fixed throughout, stained walnut, and finished in MANDERS'S "flattening" varnish (in place of the customary horrible glister compound). The old pewing has been refixed as wainscotting to the walls. The tower arch was opened to view by the removal of a rickety gallery and screens, which have also been utilised as wainscot. The tower itself is of the thirteenth century (with fourteenth-century parapet), and practically "unrestored," its only disfigurement—a modern "rolled cathedral" window—excluding the joyous sky, trees and birds from those within in the approved Philistine manner. It still needs repointing. It contains a rude ancient oak stair-ladder to the belfry. The new works and repairs have been executed by Mr. J. W. BASSETT, of Hulme End, assisted by Messrs. OVERFIELD, Leek, cabinetmakers, and Mr. STRINGER, Hanley, organ-builder; the velvet curtains and embroidery by the Leek Embroidery Society, and some metal-work by Messrs. ELGOOD, all to the designs and under the superintendence of Messrs. W. SUGDEN & SON, F.R.I.B.A.

THE BRITISH MUSEUM.

ACCORDING to the annual returns, the number of visitors to the Bloomsbury Museum during the past year has slightly declined, being 538,560 as against 558,548 in 1892. This diminution of 20,000 is accounted for by a falling off of upwards of 13,000 day visitors and of upwards of 6,000 evening visitors. The grand total, however, is above the average of the preceding five years.

The reconstruction of the Assyrian basement to serve as a lecture-room as well as an exhibition gallery has been completed in a very satisfactory manner. The fine bas-reliefs from Nineveh are now seen to the best advantage on the line of the light gallery which has been carried round the room; and the floor of the room, which has been cleared of the standard walls on which sculptures were formerly displayed, affords ample accommodation for the audience at lectures.

The rearrangement of the sculptures in the Mausoleum-room has been completed, and the suite of rooms which were formerly known as the Second Northern Gallery have been now occupied by the Cyprian collections, by the Semitic antiquities and by exhibits illustrating various religions, and have been opened to the public.

The artificial lighting of the reading-room has been greatly improved by the installation of incandescent electric lights fitted to the reading-desks. The old system of arc lamps is, however, still retained for the general lighting of the room, but at a lower power.

There has again been a slight reduction in the number of persons using the reading-room in 1893. The number of visits to the room has been 194,122, as against 197,984 in 1892. The average daily number of readers has been 645.

The number of volumes supplied to readers was 1,402,815, as against 1,366,596 in 1892. Thus it will be seen that, although the number of readers has diminished, the number of books demanded by them has increased.

The numbers of students have increased in the Departments of Manuscripts and of Coins and Medals, and slightly in the Department of Prints and Drawings. On the other hand, the number of students in the sculpture galleries has further decreased.

Presentations of Museum publications, including reproductions of prints and drawings by old masters and casts of antique gems, have been made to free public libraries, local museums and art schools throughout the United Kingdom.

With part of the means placed at their disposal by the bequest of the late Miss Emma T. Turner, the trustees, by permission of the High Commissioner of Cyprus, commenced, before the close of the year, excavations on the ancient site of Amathus in that island.

Among the principal donations of the year are the following:—

From the Egyptian Government, a granite shrine inscribed with the name of Ptolemy IX, king of Egypt, B.C. 171-17, in which a hawk, emblematic of the sun-god, was caged; and a series of mummy cases and other sepulchral objects of priests and priestesses of the confraternity of Amen.

From Mr. John Malcolm, of Poltalloch, the Sforza Book of Hours, a most exquisitely illuminated manuscript prepared about the year 1490 for Bona of Savoy, widow of Galeazzo Sforza, Duke of Milan, and afterwards in possession of Charles V.

From Miss Mary Augusta Gordon (by bequest), the journals of her brother, Major-General Charles George Gordon, kept during the siege of Khartoum, 1884, and other documents.

From Mr. John Wingfield Malcolm, C.B., a cartoon-sketch of a picture of the Holy Family by Michel Angelo.

The heirs and executors of the late John Malcolm, of Poltalloch, have deposited with the trustees of the British Museum the celebrated collection of drawings and engravings by old masters formed by him, in order that they may be made available to students. A large selection has been made from them for exhibition in the Department of Prints and Drawings.

The past year has been remarkable, not so much for any one acquisition of extraordinary importance in the Department of Printed Books, as for the great number and variety of interesting additions in almost all branches of literature. The absence of acquisitions on a large scale is partly owing to the unusually small number of important sales by auction, and the consequent want of opportunities for extensive purchases. The chief sales of the year have taken place on the Continent, and have afforded opportunities for enriching the Museum collections with some choice accessions. One of particular interest to English bibliographers, though itself printed abroad, is the letter of Pope Sixtus IV. to the Doge of Venice, February 1483, the fifth of the "*Sex quam elegantissimæ epistolæ*," printed by Caxton in 1483, the only known copy of which was acquired by the Museum in 1890. This is the only letter of the series known to have been printed in Italy, and a comparison of it with Caxton's text renders it probable that he printed from a manuscript. It was purchased at the Borghese sale, with other interesting books. Several important acquisitions were made at the sale of the third portion of the Heredia Library at Paris, particularly the Spanish translation of the travels of Sir John Mandeville, Valencia, 1521, "the year of trouble," as the colophon says, in allusion to the revolt of the commons headed by Padilla; the only perfect copy known. "*Fasciculus Temporum*," B. Segura and A. de Portu, Seville, 1480, said to be the first Spanish book in which Arabic characters were employed. Boccaccio's "*Caida de Principes*," Toledo, 1511; the second edition of the Spanish translation of Boccaccio's "*De Casibus Principum*," with a fine engraving on the title-page representing the Wheel of Fortune. "*Mirabilia Urbis Romæ*," Rome, 1500; the edition specially brought out as a guide book to the city on occasion of the jubilee held in that year.

One purchase in Italian literature is of extraordinary interest. Rarely indeed is it possible to announce the recovery of a book of merit which has been given up for lost. Such, however, is the case in the instance of the "*Essortatione al Timor di Dio*," by the Italian reformer Acontius, engineer to Queen Elizabeth, seen in modern times, if seen at all, only by Chaffepié, the continuator of Bayle, and deplored as hopelessly lost by M. Gaston Bonet-Maury ("*Des origines du christianisme unitaire chez les Anglais*"). The museum has, nevertheless, had the great good fortune to obtain a copy of this tract, interesting on the author's account and its own, and

especially so to Englishmen from being printed in London about 1580 by "Giovanni Wolfio, Servitore de Illustrissimo Signor Filippo Sidnei," and as containing two Italian canzoni and a sonnet addressed to Queen Elizabeth.

The dispersion of the famous Borghese library in Rome has enabled the Museum to add several works of the greatest rarity to its collection of early Italian music. Foremost among these are to be mentioned two very early operas, "La Morte d'Orfeo," 1619, by Stefano Landi, and "La Galatea," 1639, by Loreto Vittori, which, apart from their great historical interest, are exquisite examples of musical typography. Of the latter only three other copies are known to exist, while the example of the former, which the Museum has been fortunate enough to acquire, is believed to be unique. Scarcely less interesting historically, and of equal intrinsic beauty, are two collections of madrigals for three voices, with an accompaniment for lute and harpsichord, edited and published at Rome by Simone Verovio in 1589 and 1595. They are entitled respectively "Ghirlanda di Fioretti Musicali" and "Lodi della Musica," and are printed throughout from engraved copperplates; the former is probably the second musical work produced by this process.

Among the other acquisitions which once formed part of the Borghese Library may be cited a complete set of Marazzi's madrigals, Parma, 1577, of which only one other copy is known to exist; a single part-book of Merula's "Canzoni," Venice, 1615, a work hitherto unknown to bibliographers, and the 1614 edition of Marenzio's sixth book of madrigals, which is believed to be the only complete copy extant.

The Department of Egyptian Antiquities has, among other presents, received a granite shrine inscribed with the name and titles of Ptolemy IX., Physcon, king of Egypt, B.C. 171-17, and of Cleopatra his wife. This shrine was found lying on its side among the ruins of an ancient Coptic church at Philæ, in Upper Egypt, where it had formed the platform upon which stood the altar. In the hollow upper part of the shrine a hawk, the emblem of the sun-god, was caged, or was placed there during great festivals; it was screened from the gaze of the worshippers until a certain moment by doors, the bolt-sockets of which still remain. Strabo, a geographer, records that he saw a hawk in a pining condition in a shrine at Philæ.

Also two coffins of priestesses of Amen-Râ; the spaces left for their names by the artist have not been filled. The coffins were exhumed from a pit at Dêrel-Bahari, on the west bank of the Nile, opposite the site of ancient Thebes, by M. Grébaut, formerly director of the Egyptian Museum at Gizeh, in 1891. In the same place MM. Maspero and Brugsch discovered the mummies of Thothmes III., Seti I., Rameses II. and of several other kings in 1881; and it seems that they and the mummies of the priests and priestesses of Amen-Râ were removed there hastily when, owing to loss of influence and power, the confraternity of Amen was compelled to take refuge in Nubia in the ninth century before Christ. It is not possible to fix an exact date for the establishment of the brotherhood of the priests of Amen, but it is certain that they gained power during the reign of Amenophis I., B.C. 1666, and that for about six hundred years this power increased until they made themselves sacerdotally and politically the strongest influence in Egypt. The high priests of Amen became eventually kings of Thebes, but they soon found their position untenable, and the funeral furniture of the members of the brotherhood is all that now remains to mark their rule. The archæological importance of the coffins of the priests of Amen is very great, and this group helps to fill a gap in the national collection.

The arrangement of the Mausoleum-room has been nearly completed, one of the columns with its entablature and part of the coffered ceiling having been erected, three of the lions moved and remounted and two marble pedestals prepared for the colossal horses of the quadriga; the sculptures and architectural members from Priênè have been rearranged and remounted; the capital of one of the antæ of the temple restored and mounted; the sculptures in the Græco-Roman basement have been rearranged and the plinths and pedestals repaired; certain of the sculptures in the Ephesus-room have been moved; six new marble pedestals have been prepared for sculptures and a marble head repaired and mounted; plinths and fittings have been prepared for the room of Greek and Latin inscriptions and the cast of the Lycian inscribed monument re-erected in the old Inscription-room; one stele, two sepulchral tablets and fourteen inscriptions have been mounted on stone plinths; a terra-cotta cornice from Civita Lavinia has been restored and mounted on slate; the wall-cases on either side of the Medal-room door in the Etruscan saloon have been fitted up, and cases 26-31 prepared for terra-cotta antiquities from Cervetri and Civita Lavinia; three terra-cotta panels repaired and mounted, four oak and seven pine pedestals and a stand for drawings of the Priênè temple have been prepared, two drawings of the Mausoleum mounted and framed. The most important acquisition in the section of Early British and Prehistoric Antiquities is the gift by the Rev. William Greenwell, D.C.L.,

F.R.S., of a further series of objects excavated by him in British barrows, and described in "Archæologia," vol. lii. These are the contents of nine barrows at Willerby and Folkton, East Riding of Yorkshire; they include three very curious objects in chalk, the purpose of which is unknown. They are richly ornamented, and unlike any barrow remains hitherto discovered.

An electrum stater from Phocæa in Ionia, one of the most singularly interesting numismatic monuments which have survived from the earliest period of the art of coining, has been among the additions to the coins. It belongs to the first half of the sixth century B.C., during which time Phocæa, one of the chief centres of maritime enterprise in the Mediterranean, was supreme upon the sea (Herod. i. 163). According to Eusebius ("Chron." ed. Mai, p. 331), the Phocæan Thalassocracy lasted 44 years, commencing circ. B.C. 575. It has, however, been shown by Goodwin ("De potentiæ veterum gentium maritimæ epochis apud Eusebium," Göttingen, 1855) that the beginning of the Phocæan Thalassocracy must be placed as early as B.C. 602. From this time until the reign of Cræsus, king of Lydia (B.C. 560), the commercial influence of Phocæa, both on sea and land, was predominant, and strong enough to give occasion to an entire reform of the currency of the Ionian coast lands. The newly acquired stater, weighing one-fiftieth part of the old Babylonian gold mina, is a specimen of this reformed coinage. Artistically it is also of great interest, as it is the oldest known example of what is called a "type parlant" (i.e. a device suggested by the name of the town). On the obverse is a seal (φώκη), the badge of Phocæa, and on the reverse two rude incuse squares of different sizes. This stater is also of considerable palæographic importance, for it bears an ancient form of the letter Φ (⊙) which has not been met with elsewhere, either on coins or inscriptions. There are few coins of remote antiquity which have been so frequently cited, both by Greek historians and metrologists, as this famous electrum stater of Phocæa, of which the only other extant specimen is preserved in the museum at Munich.

THE TELL-EL-AMARNA TABLETS.

THE following excellent account of the tablets discovered at Tell-el-Amarna has been communicated to the *Irish Times* by Mr. L. E. Steele:—The startling rapidity with which discovery after discovery is being made amidst the relics of the dead past, leaves the ordinary non-expert reader very much puzzled to know where exactly ancient history now stands. It would seem that with all that has been found in Egypt we are only scraping the surface as yet; fresh history is pouring in upon us from the East in astounding volume; the land of Greece is being probed for her treasures more deeply than heretofore; Syria, with its entombed past, is muttering its secrets about Phœnician and Hittite; whole nations, of whose existence a few years ago there was not even a suspicion, have in startling detail suddenly taken their place on the pages of history. Numerous explorers, German, French and English, are at present at work in remote districts of Western Asia, the result of whose labours will not be known, perhaps, for many years to come; and, as scientific exploration is really but the birth of yesterday, we may expect that the activity now being displayed will in a few years completely revolutionise that subject which with our grandfathers was a favourite study, and which they were pleased to call "Universal History." But all these marvellous discoveries have yet to be weighed and compared, and their proper perspective determined, and until that is done by some masterhand we must be content to learn what we can of the truth and value of these separate "finds" to which archæologists are monthly calling attention. We propose in this article to popularise the results of a discovery in Egypt, which, although it was made so far back as 1888, we are only now in a position fully to appreciate, and we cannot understand its value unless we rub up our knowledge of a few facts in Egyptian dynastic history.

If the ordinary reader were asked to name at random two kings of ancient Egypt no two would occur more readily to his memory than Thothmes III. and Rameses II., and this undoubtedly from the fact that the first has been familiarised as the constructor of that elegant obelisk which stands upon the Victoria Embankment, and the second as the usually accepted "Pharaoh of the Exodus." Most useful as landmarks in Egyptian history they are to remember, for they are two typical monarchs of two of the most powerful dynasties that ever ruled in the Nile Valley, namely, the eighteenth and nineteenth. Both were great and successful conquerors and both have left behind them evidence in abundance of the superb artistic skill which their age possessed and which they fostered and encouraged.

The discoveries in 1886 of the mummies of several monarchs of the nineteenth dynasty excited most unwonted popular interest in the progress of Egyptology—a discovery which in itself, relatively speaking, of little historic value, nevertheless

served this useful purpose, that one is hardly deemed educated if not fairly familiar with the history of the chief kings of this great Theban dynasty. More recent "finds" have, however, diverted public attention from the nineteenth to the eighteenth dynasty; and to the period of this latter dynasty has been assigned the discovery which gives the title to this paper.

The eighteenth dynasty comprised eleven kings, whose reigns extended, in round numbers, from 1700 to 1400 B.C. They reigned at "hundred-gated-Thebes," where temple and obelisk tell the story of their power and lavish expenditure. The first of the dynasty was one Ahmes, whose Egyptian name the Greeks transformed into Amosis, and who distinguished himself in a most notable way; for he it was who freed Egypt from the tyranny of that strange race of foreigners known as the Shepherds, who had ruled the land for many hundred years. The event was a counterpart in antiquity to the release of Spain from Moorish domination by Ferdinand in the fifteenth century of the Christian era. Having tasted the sweets of success, Ahmes pushed with his army into the south part of Palestine, crossing that little Wady El Arish which divides north-eastern Egypt off from Syria, and succeeded in establishing a firm foothold in Syria. His successors, improving upon his triumph, had the whole of Syria practically at their feet; the many petty kings of the Canaanites acknowledging the Egyptian kings as their suzerains, just as the present Sultan of Turkey claims suzerainty from the ruler of modern Egypt.

Now, it is of the utmost importance to bear these facts in mind, and also to remember that these events occurred between 200 or 300 years before the Exodus of the Hebrews from Egypt into this very land of Syria. The towns which in late years became so familiar to us—Ascalon, Joppa, Tyre, Sidon and Beyrut—were taken by Ahmes and his successors, and they pressed on even so far as to Kadesh, a town on the Orontes, and still further to Carchemish, a stronghold on the Euphrates.

But as years rolled on these subject tribes of Syria became discontented, and rose, like the Poles in later times, against their exacting masters, until, in the reign of Thothmes III., of the Thames Embankment fame, a great rebellion took place, which, however, was successfully crushed by that great sovereign. On the walls of that temple at Karnak, the most beautiful the world ever saw, Thothmes has recorded the incidents of his campaign, entering with minute detail into the number and names of the cities which he captured, and the amount and nature of the spoil which he carried back to his country, all incontestable evidence of the advanced art and civilisation of the people who occupied Syria before the Hebrews came to trouble and dispossess them.

It would be a serious error to suppose that all this expenditure of energy and money was simply made in the spirit of a Cambyses or a Tamerlane. Thothmes had far higher motives than the mere love of conquest to urge him on to undertake this campaign. It was all-important that Egypt should hold Syria, for she had established a great trade with the lands which lay along the Euphrates, and the road which bore her traffic, a road no less than 600 miles long, ran from Zoan, the most eastern stronghold in Egypt, right northwards through Palestine, Northern Syria, to Babylonia. Vast commercial interests were at stake, and Thothmes well knew their value.

Now it is upon this period of Egyptian history, and the relations of the Egyptian monarchs with Syria, that this discovery has thrown such an extraordinary and unexpected flood of light, and equipped with these few historical facts, we are now in a fair position to grasp its significance.

There is a little Arab village, near the Nile bank, about 150 miles south of Cairo, and midway between Memphis and Thebes, known by the Arab name of Tell-el-Amarna. In 1888 an Arab peasant woman, grubbing amongst the ruins of the ancient city of Khuenaten, which are not far from this village, suddenly came upon a number of little clay tablets covered with inscriptions. She unearthed no less than 320. The authorities at once pounced upon them and distributed them amongst the chief museums of Europe, and although the majority have gone to Berlin, the British Museum has fortunately secured eighty-two of the precious tablets. Full translations and accurate descriptions have now been published, and these invaluable documents of a remote age are now known as the "Tablets of Tell-el-Amarna." They vary very considerably in dimensions, some of them being almost 9 inches long and 5 inches broad; some only 2½ inches in length and less than 2 inches in width. They are in many cases in colour and shape not unlike Spratt's dog biscuits. We are familiar with the form of the cylinders which formed the library of the Assyrian king, Assurbanipal, discovered years ago at Kouyanjik, but the forms of these little tablets are quite different: some are rectangular and some are oval; some are made of a yellow, some of a red clay, and some are made of Nile mud; and, as will be readily seen, the material used is an indication of the region of their origin.

They are closely covered with that peculiar and very early form of writing which appears to have prevailed in Western

Asia before an alphabet was evolved, namely, the cuneiform or "arrow-headed" writing, but of so novel a variety that in many cases the translators, skilled as they were in the Assyrian mode, have found much difficulty in interpreting it.

These little clay tablets are no less than so many letters, and the whole collection represents a corpus of official correspondence dating from the fifteenth century B.C., carried on between three Egyptian kings of the eighteenth dynasty and sovereigns of Babylon, Assyria, Armenia, Asia Minor and the Egyptian deputy-rulers of towns in Palestine.

The bulk of the correspondence is very considerable, and is said to amount in quantity to about half the Pentateuch.

Let us realise the unique interest attached to this collection of letters. In the first place they are the identical documents penned by hands who have now lain in the silent tomb no less than 3,400 years; they are originals, not copies. There they are with their words, erasures and corrections as the old world scribe left them, clear and clean cut; so much so that distinction in handwriting is detectable, one correspondent having employed four or five scribes in the course of seven years. Then, again, they launch us back into time to a period antecedent to the Exodus, and reveal to us an unexpected civilisation in Palestine, and in countries north of Syria as existing before that event. We are actually introduced by them to the Canaanite at home. They tell us of the political relationship in which the mighty Egyptian monarchs stood to the kings or governors of Western Asia. They give us novel information as to the offensive and defensive treaties made with peoples who are only now beginning to take shape as they rise out of the gloom of the past. They speak of marriage alliances, of religious ceremonies and of intrigues; they enable Biblical scholars to identify many towns named in the Scriptures, and Egyptologists many towns named on the great list at Karnak, and finally the dialect in which they are written supplies a number of new words and constructions which were heretofore quite unknown to linguistic scholars.

Having acquired some knowledge of these extraordinary records, let us now make acquaintance with the general contents of these letters. They may be roughly grouped under two heads (a) letters from foreign sovereigns, and (b) letters from Egyptian governors of subject towns in Palestine. The letter which chronologically would appear to be the first of the series seems to have been written to Thothmes IV., not later than 1520 B.C., by one Rimmon Nerari, who makes an earnest appeal to his Egyptian sovereign and master to send him soldiers to fight the Hittites, those curious pig-tailed, slant-eyed people of Mongolian race, who were then troubling North Syria. Thothmes IV. was succeeded by his son Amenophis III., who is popularly known as Memnon and as the erector of those two superb well-known statues, the Colossi of Thebes. He made a most important foreign marriage alliance, one which indirectly brought in subsequent years disastrous results to his dynasty. He married a lady called Thi, a princess, and daughter of a king of Mitani or Mesopotamia, whose tomb was found at Thebes and from which two stibium tubes now in the British Museum were taken; the longest letter in the collection is from Dusratta, her brother. The letter now lies under a glass case in the British Museum. It has no less than 518 lines of minute cuneiform inscription, and the subject matter of the letter deals with an offer of marriage which another Egyptian sovereign, Amenophis IV., the last king of the eighteenth dynasty, had tendered to Tadukhepa, the daughter of this Dusratta, a marriage which eventually took place.

But these kings also sought marriage alliances with the royal family of Babylon, and one of the most entertaining group of the series is that which recounts the chaffering and haggling, dignified, however, as far as language is concerned, about their daughters.

One of the letters (No. 1, British Museum) is a duplicate of a letter addressed by Amenophis III. to a king of Babylonia, Kalimmasin by name, who here appears for the first time in history. The Egyptian sovereign has asked for one of his daughters in marriage, and Kalimmasin objects to send his daughter so far, and, moreover, states that his sister has been married to a former Egyptian sovereign, and had never been seen or heard of since by her own people; urges other excuses—that it was a Babylonian custom that the daughters of the royal house should marry at home, and that even if he did agree to send her he had no guards and chariots to conduct her so far in safety. But Amenophis is equal to the occasion, and replies to all his objections; says that Kalimmasin's sister is alive and well, offers presents, and to defray the expenses of the journey, and is so accommodating that he leaves it to the Babylonian king to decide which daughter he shall send. Poor Kalimmasin, encouraged by these overtures from his brother-sovereign, ventures to suggest that the compliment might be returned by the gift of an Egyptian princess for his harem. He receives a sad snub. The letter of reply to this audacious request has been translated in all its ruthless insolence. It is probably the earliest instance on record of pure and unadulterated snobbery.

It would delight the heart of a Thackeray. The letter closes with the cool remark that "the daughter of the king of the land of Egypt hath never been given to a nobody."

The series of letters addressed by various Egyptian governors of towns in Palestine to Amenophis IV., the last king of the great eighteenth dynasty, best known as King Khuenaten, is intensely interesting. A great drama is being enacted. The Hittites and the Amorites—called Amurri on the tablets—are swarming into Palestine and town after town goes down before their impetuous rush. Letters from governors of Byblos, Beyrut, Tyre, Sidon, Ascalon, and finally from Gezer, a town close to the confines of Egypt, show the gradual but sure success of the enemy as they make a clean sweep of the Egyptian garrisons. From history we know how the land of Egypt was just at this period rent by domestic dissensions. The king, who was an eminent reformer of the art and religion of his country, had excited jealousies and enmities at home by his novel departures, and had his hands pretty full. He was quite unable to send troops to the assistance of his faithful governors. There are no less than fifty letters from a man, Rib-Adda, who was governor of Byblos, a town referred to in the Psalms as Gebal—"Gebal and Ammon and Amalek; the Philistines, with the inhabitants of Tyre." There is something wonderfully realistic in the earnest appeals which Rib-Adda makes to his sovereign as he describes how the enemies press on. For five years he holds out. His last few letters are full of despair, and the sudden cessation of the correspondence tells the tale which our imagination easily completes; the tragedy of Byblos closes on a darkened stage.

But perhaps the most interesting of all the letters, from the popular point of view, are six epistles written from Jerusalem (Urusalim on the tablets). They are amongst the very few which are addressed to Egyptian sovereigns from towns in Southern Palestine, and are priceless in their suggestiveness. The importance of these six letters lies in the fact that for the first time in a profane history a possible reference occurs to the coming of the Hebrews into Canaan after their wanderings in the desert; but if this be the case our preconceived notions of the period at which they entered the Promised Land will be entirely revolutionised. In an early part of this article we drew attention to the fact that the events referred to in these tablets must have occurred some 200 years before the Exodus. This statement was based on the supposition that Rameses II. and Menephtah, kings of the nineteenth dynasty, are respectively the Pharaoh of the Oppression and of the Exodus. It may as well be frankly confessed that this supposition rests on a very insecure basis, and if these six letters really contain a report of the invasion of the Hebrews, we must be prepared to throw the Exodus back over 200 years earlier than the time of these two monarchs.

What then do the tablets tell us? We have seen from the other tablets that the enemies of Egypt in the North of Palestine were the Hittites and Amorites, but the governor of Jerusalem has to deal with quite another foe. He earnestly appeals for aid against the people of the "Abiri," who, we are informed, have rebelled "as far as the land of Seir." We learn that they conquered and devastated the neighbourhood of Gezer and Ascalon and Lachish, and took the towns; that they fought a battle at Ajalon, and that they forced the town of Keilah to submit; that they attacked the King of Jerusalem, and finally, as proof that they were hostile to the religion of the inhabitants, they appear to have destroyed the idolatrous temples of the Amorites. Now, the important points to note in connection with this record are—first, that scholars admit that there is no objection, as far as language and its history go, in accepting this word "Abiri" as equivalent to Hebrews; second, that this reference to Seir is quite in accordance with the Scripture statement as to the point at which the people of the Hebrews entered the land; and third, this hostility to the religion of the country points to the fact these "Abiri" were entirely out of sympathy with the natives of Palestine. These are strange coincidences, if nothing more; but there is a fairly reasonable probability that we may claim this reference in these marvellous tablets as independent evidence, if we needed it, of the record of Holy Scripture as to the invasion of Palestine by the chosen people.

We have dealt very superficially with the wealth of literature supplied by these extraordinary tablets, but we have said enough to show that this correspondence of the Foreign Office of Egyptian sovereigns who ruled 3,400 years ago is full of vivid interest to us, though separated from them by so vast a space of time.

While we write, news of two great discoveries reaches us from Egypt. Mr. de Morgan, who has been exploring in the neighbourhood of the Pyramids of Dashour, not far from Cairo, reports the discovery of two boxes full of the jewels of kings and princesses of the twelfth dynasty, and the indefatigable Professor Petrie has just returned from his investigations at Koptos, an ancient city-site near Thebes, where he claims to have unearthed some statues of prehistoric Egyptian times which, he states, brings us another step towards the solution of that ethnographical puzzle as to the original home of the ancient Egyptians.

SPECIFICATION WRITING.*

I HAVE been asked by Professor Laird to talk to you on a subject connected with the practical side of my profession.

Now I do not know anything more practical than the matter of the preparation of building specifications, and if you will bear with me for a little while in discussing this uninteresting, but quite important, question, I will try to tell you something about them based upon my own experience.

In reality, an architect commences to write his specifications when he commences his drawings—one involves the other. The knowledge requisite for the one is as necessary for the other, and as the lines are drawn the specifications form themselves. The insight into construction necessary to draw correctly indicates the ability to describe the work shown on the drawings. Without this ability the drawings and specifications alike will be failures.

There is no one thing in our profession that has as much to do with personal success in its practice as the ability to properly prepare specifications. And I do not in stating my idea as to relative importance except the question of design; because to one person able to discriminate at all between good and bad design, there are a great many who very clearly distinguish between good and bad business ability, and who will not fail to express their opinion of the architect who does not properly protect them, who, for instance, forgets to specify the stripping of walls, or the traps on plumbing fixtures, or the rain conductors. And the fact that the exterior of his house is an architectural "dream," or that the detail of his mantels and stairway is "out of sight," will, in a certain sense, be only an aggravation of the offence—a sort of adding insult to injury which he will not forget. And your chance of making a living at your profession, not to speak of a fortune, which is hardly possible—at least I have never heard of an architect dying rich—depends upon the reputation you make as a careful practitioner.

To carefully write your specifications is indispensable to successful and conscientious supervision of the work; it is impossible where they are drawn loosely or in a slovenly manner, and it is not worth while to handicap yourself in this way and add unnecessarily to the inevitable load of responsibility and worry which will come legitimately with the practice of your profession. It does not do for building; they are apparent for all time, and, like the fly in the pot of ointment, spoil the whole. Mistakes are two-edged swords. They destroy your client's confidence and your own, the latter perhaps more disastrous to you than the first. Of course all this philosophising applies also to the drawings, but if you prepare your specifications with care and minuteness you will escape most of the pitfalls, and they will greatly help you to accuracy in the drawings.

The specifications bear somewhat the relation to the drawings that the arteries and veins do to the body, and they should, like them, extend from the foot to the head, from the footings to the cresting of the roof, and ramify in all directions, covering each little point of construction and material. They cannot be too full. Nobody ever got into trouble because he too minutely described the work to be done or the materials to be used.

To draw good specifications requires exact knowledge. You must know precisely what you want and how you want it done. Your directions must be specific, as the name implies, and clear and simple in expression. Make your paths straight, so that the wayfaring man, though a fool, shall not err therein, but make them narrow as well, so that he shall not have room to wobble. It does not follow necessarily that he will be a fool, though it has sometimes seemed to me that nothing short of idiocy could explain what seems to be an irresistible impulse that forces the average workman to do things exactly the wrong way when the reverse is really easier.

It does not do to specify things generally or to assume that "Oh, they will understand that." Believe me that they will not; if there is any possibility of a misunderstanding it will be embraced. Do not leave your phrases until they are clear beyond any possibility of ambiguity, remembering always that it is too late to change the specifications after the contract is signed, and that it may be exceedingly inconvenient to have to explain clauses which are capable of more than one reasonable construction.

It is a great help to use the trade terms, names and grades. The builders understand them, and it will enable you to ascertain more readily whether you are really getting what you specify, and where it is practicable I would specify materials which have their quality marked on them. But unless you have some reason for requiring a particular make, it is better to specify two or three makes equally good rather than the make of any one manufacturer. I know no class of men more disinterestedly honest than architects, or who so little let questions

* A lecture delivered before the Architectural Department of the University of Pennsylvania by Mr. T. Roney Williamson, architect, and published in the *American Architect and Builder*.

of money or profit have any bearing on their professional conduct. But it is possible that a misconstruction may be put upon a perfectly innocent act, and the requiring of the product of a particular manufacturer may give rise to question, particularly if there are other goods of the same grade and general worth in the market, and it is well to avoid even the appearance of evil. In addition to this reason, which I express with some hesitation, and which I am very well aware may be open to the charge of timidity, there is this other, that to close out the goods of all manufacturers but one destroys the chance of competition. That these remarks are perhaps rather less practical than ethical is true, but they have something to do, nevertheless, with what has been my practice in preparing specifications.

The sin peculiar to the specification is the sin of omission, and the greatest particularity will hardly insure against it. I use as a sort of safeguard a scheduled synopsis and use it always, which I will show you and explain further on and which I have found of the greatest use, but which must be added to continually as the complexity of work and the increase in the number of appliances and methods become greater with the passing of each year.

In making drawings it is my custom and that of other men as well, I have no doubt, to print upon them many notes as to things not of a nature to be clearly shown by the drawings, placing the notes on the parts to be explained, noting girders, beams and their sizes, sizes of flues and their linings, if any, finish of rooms, kind of flooring, kind of glass and many other matters of that kind. They are really part of the specifications and should be specified in them also, or at least attention called to the fact that such notes are to be taken as part of the specification in the general clauses of the specification to which I will refer later on. One advantage in placing these notes is, first, that as they are made at the time the drawing is made, they are fixed there once for all and are not liable to be forgotten, as they may be if you wait until you write the specifications; and secondly, that they are right before the builder's nose when he looks at the drawings and he is not likely to miss them.

A not very usual thing, but a very convenient addition to a specification is a table of contents, giving the page-number and a list of the subjects on the page. It saves a good deal of time in the use of the specification and is very little trouble. And somehow, as there is never enough time and always too much trouble going, any labour and time-saving devices are of value.

The working or detail drawings, in contradistinction to the contract drawings, *i.e.* the plans and elevations, are the final exponents of the contract drawings. These drawings are made up from the contract drawings and the specifications, from which last the methods of construction, size and kinds of materials must be derived. They embody both, and if it were possible to make the working drawings with the contract drawings before estimates are made, the specifications might be shorter, which would be desirable; and as it is impossible to make in many cases the word written as readily understandable as the word drawn, there might be less misunderstanding, which would be still more desirable. In this connection let me say that exact and minute specifications and full working drawings will enable you to build cheaply, an important thing to your client, who, if he be like most of us, is generally scheming to get a dollar's worth for ninety cents, because the bidders will not have to allow so much for "laps and slams," for the things not clearly shown or definitely specified, but which look the larger and more dangerous because they are undefined. As a general thing, when great differences in the amounts of bids occur, you may make up your mind that there is some want of clearness or of particularity in the specifications of drawings. The exception to this rule is caused by the irresponsible bidder who throws his hat at the drawings and guesses how much the work is worth, and who is either very high or very low; but in fact he should not have a chance to bid, as generally his hope triumphs over his experience, and he bids low and sometimes gets the building, to the ultimate scamping of the work, his own loss and also the owner's, and to the despair of the architect. It is this sort of bidder who grizzles the locks of the superintendent, and eventually brings his gray hairs in sorrow to the grave. Avoid him, if possible, and care and firmness will generally enable you to dodge him, but you must avoid him before he bids; afterwards it may be too late, for your client having the easy idea that the architect is paid to watch the builder anyhow, is apt to turn a deaf ear to your suggestion that he take a higher bidder at an ostensible loss of the difference, expecting you to play stop thief, a sort of "I spy" game with the contractor, with the usual result of making for yourself, at the least, two enemies—the owner and the contractor—and of having been unable to entirely protect the owner or curb the contractor.

There are some things you will require to specify which are difficult, almost impossible, to describe, so that their value can be got at—stained or leaded-glass, for example, or an elaborate

stairway or carving, and matters of that sort. My method in such cases is to put a price on them, for glass by the foot, unless I intend very elaborate work, in which case I omit it and say so. If for a stairway, I name a lump sum, and specify whether that includes the nosing or not and the finishing. For carving, I specify a sum of money to be allowed, or if very costly, like figure-work, omit it and say so. When a sum of money is allowed, you should state that the owner is to buy where he pleases, otherwise you may find some trouble in putting the work where it will be best done.

Forms of specifications vary somewhat, but in essentials they are alike. I presume you are familiar with their general make-up; in fact, it has been a matter of some debate with me how much of this talk is threshing of old straw and an old story to you. However, I have concluded that it won't hurt you to hear again what you have already learned, and I may have said something that will help to impress upon you the instruction probably received before.

The specifications begin with the recital of the general clauses. The general clauses are those which are to be observed and followed by all the trades connected with the work of the building, which call attention to requirements common to all and are binding upon all.

The first of these refers to the architect and his authority, whether he is to supervise the work or not. If so, the clause is worded thus, "The work to be erected under his supervision and to his approval without reference to any other person." The sentence "without reference to any other person" is an interpolation of my own, but it is a good one, as it makes you the dictator as it were, the sole arbiter of the drawings and specifications, and while it seems to add responsibility, really lessens it, or at least simplifies it and will rid you of a good deal of foolish and annoying interference from both contractor and owner. It is occasionally objected to, sometimes by the contractor, but not often, the contractor knowing from experience the safety that lies in a court of last resort; more often by the owner, but I think it well to insist on it. It defines the authority of the architect positively and rids him of the annoyance of having his decisions overruled. This does not refer to any question of values necessarily (the agreement usually providing that dispute as to prices, &c., shall be decided in some other way, as by arbitration), but to matters connected with the design and the meaning and intent of the drawings and specifications, where the architect is the only person who is qualified to decide after all.

The second clause refers to the unity of the drawings and specifications, calling attention to the notes written upon the drawings as being part of the specifications and that drawings and specifications are to be taken together and not separately. Work shown or mentioned in either to be taken as if in both. This clause is intended to insure against omissions in either of the two and is a valuable one. The utmost care may fail to include in both what may be in one or the other.

The next provision is one requiring the contractor to follow the detail drawings as the final exponents of the contract drawings, with the implied guarantee on your part that they shall show no new work or work not suggested by the contract drawings, but which insures you an opportunity to correct or improve on your design up to the last moment within the bounds of the rights of the contractor.

Next, a claim of importance requires the builder to follow the figures on the drawings rather than to measure them with scale. Builders will use the two-foot rule if they are permitted, with unfortunate results, particularly where you have worked things down in your planning to a very fine point. This same rule, generally the worse for wear, is not a safe instrument to use, particularly if your drawing is one ninety-sixth or one forty-eighth the full size, while the figured drawings, if properly checked, can be made exact without any possibility of doubt.

The last clause of the general clauses is one requiring the contractor and all trades to comply with all city ordinances and requirements; to pay for all permits, and to hold the owner free from all penalties for infringement of ordinance, or failure to comply with the same.

Some copies of specifications I have seen have more than these clauses; but I think that these embody all that apply directly to the work of the building, any other requirements belonging more particularly to the agreement.

The methodical arrangement of specifications should be this:—Excavation, stone-mason and cut-stone, marble, brick-layer, terra-cotta, mosaic floors, tiling, cement pavements, carpenter, mill-work, plumber, tinner, plasterer, galvanised iron, roofer, iron-worker, beams, &c., painter and glazier, heater, steam-work, engines, electric-work, dynamos, &c., lifts. Each trade should be complete in itself, and the specification should embody all of the work and materials required, and any work or materials to be done or supplied in connection with any other trade, as for instance, the tinner sometimes supplies registers, to sizes given by the heater contractor, which are set by the plasterer. You see these three trades require each notice that the others have to do with them. It is necessary,

also, that if for any reason you vary the work usually done by any one trade, you shall give notice to it, that either it shall include work not generally taken or exclude work usually taken, as for instance, the painter I always require to furnish the glass. In some localities the millman furnishes the glass for the general trade. If you wish to avoid any trouble, you must always say in the mill-work specification that he shall not furnish the glass, or omit it from the painter, and let the millman furnish it. You can require the plumber, if you choose, to put enamel paint on a tub or on a wall of a bath-room, or to supply casings of wood or marble for his fixtures. And the reason you do this is to avoid interference of one trade with another, and to make the plumber entirely responsible for his own work, so that he cannot plead for any breakage or spoiling of work that the carpenter, mill-man, or painter, or marble-worker, did it. Now when you have done this, you must notify the painter, mill-man, carpenter, the marble-worker, that the plumber does this work, otherwise you may pay twice for it; that is, both trades may estimate on it, seeing it required on the drawings and clause No. 2 of the general clauses before them, which would be unfair to your client, of course.

Builders sometimes object to the grouping of work in this way, and unless the trade whose usual business it is to provide the work or material is notified in his specification, it may make confusion. Notification is sufficient, however. And thus while you make the plumber provide all marble-work required, you have let the marble mason know that, and also to know where the specifications for that marble-work will be found, by your intimation in his specification. Always draw each specification so that, if the work is let separately, each man's work is in his specification complete, with nothing left for implication one way or the other.

With a general contractor as the builder (one man who assumes all the work) he is, of course, responsible to you and to the owner, and work or material specified anywhere in the specifications would be held, from a legal point of view, to be his to do or furnish. But if your specifications are defective as to who of all those who contribute toward the work does each part, you can put your general contractor in a hole very easily, and he has a moral right to expect that when he gets his estimate from mason, plumber, or any one else, that they have taken all that is required, and that there is no such ambiguity as will cause him to lose money instead of making his legitimate profit, and in which latter case he is likely to make your existence an unpleasant one as far as your connection with that building is concerned.

Your specifications must agree with the drawings. There must, of course, be no conflict between them. Each building is *sui generis*. There can be no general specifications prepared which will meet every case. There are forms of specifications printed which proceed upon the idea that you shall cross out any clauses not applicable to the house for which they are intended to be used, leaving in those which are; but you are very likely if you use them to leave in parts which have no business to remain, and you will have specified cornices where outlookers are shown; turned posts where squares are drawn; stone heads where arches are shown, and a thousand other inaccuracies, small, perhaps, but all requiring explanation, and lessening your control of the work; in addition to this, crossing out, or interpolating, gives rise to question sometimes, and it may be hard to prove, from such specifications, their correctness.

(To be continued.)

VANDALISM IN THE SEVENTEENTH CENTURY.

THE new volume of the Historical Manuscripts Commission relates to those owned by the Duke of Portland and preserved at Welbeck Abbey, belonging almost exclusively to the history of the Harley family in the seventeenth century. We have the correspondence during that period of Robert Harley, Earl of Oxford, whilst he was still young and unimportant, and also of his immediate forbears, namely, his great-grandfather, Thomas Harley, his grandfather, Sir Robert Harley, and his father, Sir Edward Harley, all of Brampton Bryan, in Herefordshire, in which county they had been established for many generations. They were connected by ties of blood and marriage with several of the leading families of the neighbourhood, and consequently occupied a position of some importance in the affairs and interests of the county. Of Thomas Harley, the great-grandfather, we know little save that he seems to have been a useful country gentleman, but of Sir Robert, his son, we know more, as a large number of his letters are preserved. He did not confine himself to Herefordshire, but went out into the great world, made friends, and corresponded, amongst others, with Dr. Donne, Sir Edward—afterwards Lord—Herbert of Cherbury, and George Herbert, the poet, who sends him an interesting letter upon current events, written

from Charing Cross on December 26, 1618, by request of Sir John Danvers. A marriage was proposed between Sir Robert Harley and Ann Coningsby, daughter of Sir Thomas Coningsby, of Hampton Court, also in Herefordshire, but the negotiation was broken off on the vexed question of money, and he ended by marrying three times, his last and most distinguished wife being Brilliana Conway, who received her unusual name or Brilliana from the fact that her father, Sir Edward—afterwards Viscount—Conway was governor of the Brill at the time of her birth.

The story of the defence of Brampton Castle by Brilliana, Lady Harley, against the king's forces in 1643 is too well known to the students of the history of that period to require more than a passing notice, but there are many gaps in the correspondence of the Lady Brilliana Harley—as she is sometimes incorrectly called—which was published some years ago by the Camden Society, which are here supplied. The castle was twice besieged—once in her lifetime in 1643 and once after her death. She herself successfully repelled the first attack, which began in March and lasted on into August. But she succumbed shortly afterwards to the anxiety and strain of mind and body which she had endured. One of her attendants, Samuel Moore, writes to a servant of Sir Robert Harley to tell him the sad news that “this Sabbath day the sweet lady's soul went to keep eternal Sabbath in heaven, where she can never be besieged.” When the second siege took place the assailants were more successful, and the whole garrison, including three of Sir Robert's children, were taken prisoners and sent to Ludlow Castle. They were set at liberty in May 1644 and allowed to rejoin their father in London.

Sir Robert Harley was a rigid Puritan, with all the Puritan's horror of graven images, and we find him, after the first part of the civil war was over, entrusted with the congenial task of superintending the planing off of the “idolatrous” pictures in Westminster Abbey and other churches and chapels, removing the stained-glass from the windows, taking down “the statues of the Virgin Mary and other saints,” melting down the church plate, and destroying the precious vestments which still remained in the sacristy presses. One item which we may mention details the burning of the embroidery called “The Glory,” belonging to the high altar of Canterbury Cathedral. The list of receipts for iconoclastic work done under his direction in the years 1644 and 1645 gives a matter-of-fact but none the less vivid account of destruction which nowadays would shock the least artistic amongst us, and makes us feel that the hand of the reformer in the reign of Henry VIII. was less harmful than the furious zeal of the Puritans under the Commonwealth. To show the feeling with which pictures and images were generally regarded at that time, we may quote a curious letter from Brilliana Harley (the daughter), written to her brother Edward on January 14, 1639. She writes:—“My father had lately brought him a most horrible picture of the Great God of Heaven and Earth, which he broke all to pieces;” and again, a few days later she writes:—“My father sent for it (the picture) and broke it in pieces, and I flung the dust on the water.” Before long, however, Sir Robert became so completely out of sympathy with those at the head of affairs that he was obliged to give up public life, and we find him living in London for some years in great retirement and probably poverty, and viewed, moreover, with great suspicion by his former colleagues. He removed to Ludlow about 1652, having been refused a resting-place at Shrewsbury, and died there in 1656 without ever returning to Brampton, which had been burned at the time of the last siege.

EXHIBITION OF MARINE PAINTINGS.

THE museum and art gallery committee of the Birmingham Corporation having decided to hold an exhibition of works by living English marine-painters, Mr. Whitworth Wallis has been busily engaged for some months past in getting together a representative collection, which, to the inhabitants of an inland town, says the *Birmingham Post*, should be particularly interesting and attractive, and which will be found to be a worthy successor of the Burne-Jones, Watts, David Cox and other exhibitions held in former years. Under the special circumstances Her Majesty the Queen has been graciously pleased to lend, from Windsor Castle, the picture of the Jubilee Review, by Sir Oswald Brierley; and the Duke of Saxe-Coburg-Gotha also contributes three works by the same artist. The Prince of Wales has again testified to the interest he takes in the Birmingham Museum by contributing from Sandringham two pictures, by Mr. W. L. Wyllie, R.A., of His Royal Highness's yacht “Britannia.” Mr. Henry Moore, R.A., will be represented by no less than eighteen works in oil and water-colours, including “Sunset after Storm,” “Storm Coming On,” “A Pilot Cutter,” “Mussel Gatherers,” “Summer at Sea,” “Snowstorm Clearing Off,” “Clear Weather after a Gale,” “Off the Start,” “The Sound of Isla,” “Westward,” &c.; Mr.

J. C. Hook, R.A., by his celebrated "Luff, boy," "Between the Tides," "The Day for the Lighthouse," "Low Tide Gleanings," and "Wreckage from the Fruiter"; Mr. John Brett, R.A., by the famous "Britannia's Realm," lent by the trustees of the Chantrey Bequest, "The Gray of the Morning," "The Sicilian Sea," "Cornish Lions," "Morning among the Granite Boulders," and "Isles of Skomer and Skokham"; Mr. Colin Hunter, A.R.A., by "Lobster Fishers," "The Silver of the Sea," "Burial of the Macdonalds" and "The Water Carrier"; Mr. Stanhope Forbes, A.R.A., by "The Lighthouse," lent by the Manchester Corporation, and "Off to the Fishing Ground," lent by the Corporation of Liverpool; Mr. A. W. Hunt is represented by "Dunstanborough," "Hastings," "The End of the Reef" and "Tynemouth Pier"; Mr. C. Napier Hemy by "The Trammel Net," "Saved," "The Cornish Sea," "Adrift," "Falmouth Natives," "Sea Fishing" and "Oystermen"; Mr. Edwin Ellis by "The Derelict," "After Three Days' Gale," "King and Queen, Flamboro'" and "Kingdoms of the Sun"; Mr. Frank Brangwyn by "Assistance," "Stand by" and "All Hands Shorten Sail"; Mr. Tom Hemy by "Women and Children First" and "Surely the Great Waters shall not reach unto Them"; Mr. Tom Graham by "The Passing Salute," "The Last Boat" and "Nooning"; Mr. Hamilton Macallum by "A Water Frolic," "Fishermen of Positano" and "High, Low, Jack and the Game"; Mr. W. L. Wyllie by "The Britannia," "Off the Eddystone," "Yes, Sah; Sixpence, Sah," "The Spanish Armada," "Davy Jones's Locker" and ten water-colour drawings; Mr. C. W. Wyllie by "All on a Summer Day," "Littlehampton" and "The Brimming River"; Mr. H. S. Tuke by "Summer Time"; Mr. David Murray, A.R.A., by "Britannia's Anchor" and "In Dartmouth Harbour"; Mr. Edwin Hayes, R.H.A., by "Off Gorleston," "Hard-a-Port," "French Fishing Fleet" and "The Entrance to Pieve Port"; Mr. E. M. Hall by "The Mermaid's Rock," "Sigurd Carries Off the Prince of Ireland" and "Strangers on a Strange Shore"; Mr. W. H. Bartlett by "The Seal Diver" and "Wrack for the Farm"; Mr. Albert Goodwin by "Sinbad entering the Cavern," and "The Rich Strand"; Mr. Walter Langley, R.I., by "The Departure of the Fishing Fleet"; Mr. R. W. Macbeth, A.R.A., by "A Sardine Fishery." Important works by Messrs. W. Small, Walter J. Shore, Arnesby Brown, Nelson Dawson, J. Fraser, &c., enrich the collection. Among the contributors are the Queen, the Prince of Wales, the Duke of Saxe-Coburg-Gotha, the Corporations of Manchester, Liverpool, Maidstone, Leeds, Oldham, Preston, &c., Sir J. E. Millais, Bart., R.A., Sir Donald Currie, M.P., his Honour Judge Bacon, Mr. J. L. Pearson, R.A., Colonel Hargreaves, Dr. Marshall, Dr. Fox, Messrs. J. Penningham Thomasson, J. Postle Heseltine, Henry Tate, George Macculloch, W. S. Caine, M.P., S. Pope, Q.C., J. T. Brunner, M.P., James Mansergh, William Kenrick, M.P., Charles Winn, David Hedges, John Power (of Coventry), J. D. Laurie, Albert Wood, Edward Priestman, &c. A special illustrated catalogue will be prepared, and it is hoped that the collection will be opened on October 1, as the museum staff is now busily engaged in rearranging the permanent collection previous to the arrangement of the special exhibition, the contributions to which are daily being received from their respective owners.

THE "PARTI" IN THE ECOLE DES BEAUX-ARTS.

THE latest number of the *Architectural Record*, published in New York, contains, among other interesting and finely-illustrated articles, the third instalment of Mr. Ernest Flagg's description of life in the Ecole des Beaux-Arts, Paris. The following relates to one important condition in the studies:—

It is often said that the teaching of the school is not of a practical kind, that the *projets* are for buildings such as one seldom encounters in real practice, that when the student receives his diploma after years of study he is entirely ignorant of the most commonplace duties before him, but the results do not justify the criticism.

The ordinary practical affairs of everyday practice can be quickly picked up, but what is taught at the school can be learned so well in no other way and in no other place. The principles taught there can be applied as well to the cottage as to the palace, for they are the principles of good taste. One is taught a knowledge of the resources of the art and mastery of its technique.

Her atmosphere is not congenial to the growth of sentimentality; one hears little about the picturesque. The teachings of Ruskin and Turner are foreign to her methods. Her standards of art are of a higher type. Art is regarded as the highest effort of the intellect of man, the measure of his superiority over all created matter, and the human figure, the most beautiful work of the Almighty, is accepted as her canon and guide.

The evidence of the intellect of man in architectural design lies in the symmetry and logical disposition of the parts as shown principally upon the plan. M. Charles Blanc reminds us that man alone of created beings can trace a geometrical figure.

The lesson of the human form as applied to such design is perfect symmetry to the right and left of the central axis and diversity from head to foot. On this principle has every masterpiece of architecture from the earliest record of man been conceived. Success or failure at the school, so far as the architect is concerned, depends chiefly upon his ability to seize the *parti*.

This word *parti*, as used at the school, means the logical solution of the problem, and as every true architect must have two natures, the practical and the artistic, the *parti* must be the logical solution of the problem from his dual standpoint as constructor and artist. The ability to grasp the right *parti* is a gift of nature; it can be acquired only to a limited degree. It is the characteristic of genius in architecture. Without this gift no man can ever hope to become a great architect.

A certain *parti* for the *projet* is taken by every student *en loge* during the twelve hours allowed for the sketch; but the *parti*, as it is called—that is, the *parti* par excellence, or a solution which is logically right from the artistic and practical standpoint—is seldom taken except by the gifted or by the learned. If by the latter it conforms to the traditions of the school, and is awarded a mention. If by the former it shows originality and thought, and the maker receives a medal or a prize, as case may be. For originality which conforms to the laws of good taste more than anything else receives encouragement at the school.

As the *parti* is most clearly shown on the plan, the plan becomes the chief consideration, and upon it is lavished by far the greatest study and care.

For the same reason the plan is the chief consideration of the jury; it is scarcely an exaggeration to say that in making awards the plan counts for nine points out of ten.

Where so much attention is paid to the *parti*, architecture cannot be very bad.

The consideration of the *parti* militates against many things of which we in this country are fond. Where the *parti* is considered affectations disappear, for the design must conform to the dictates of reason. The same consideration makes it necessary to comply with the laws of health and convenience in structures to be occupied by man. Where the *parti* is considered people do not build miles upon miles of tenements lighted only at the front and rear, having slits—courts, so-called, 4 feet wide, on which open all bedrooms, a menace alike to the health and morals of the community—buildings often occupied by twenty families on land barely sufficient for two or three. Rich men do not build country *châteaux* against the street lines of cities, nor do communities claiming to be civilised and refined make choice of barbarous styles of architecture, like the Romanesque, for instance, in which to express their aspirations.

To say nothing of the artistic considerations, the study of the *parti* saves to France millions upon millions yearly, for careless planning is one of the most expensive pursuits a nation can engage in, and such planning is seldom found in France. The room thus saved is devoted to light and air. Paris is perhaps more densely populated than New York, but the buildings are properly lighted.

In Paris the *parti* of the city, too, is considered. One does not see there buildings of ten, twelve and even twenty storeys rearing themselves, monuments alike to the greed of the landowner and the folly of the community which permits such blemishes on the beauty of the town.

The *parti* is always dictated largely by common sense; it wars against ignorance, vulgarity, waste and ugliness in architecture. Its characteristics are fitness, beauty, convenience, economy and reason.

Because we do not consider the *parti* we were surprised that the French did not admire the buildings of the late Chicago exhibition; viewed from their standpoint in respect to the *parti*, they were a gigantic failure. In the opinion of France, America is the champion of progress. America is modern, America is free. Judge, then, of her surprise to find at the exhibition, which was to show to the world her progress, her civilisation, an array of buildings evidently inspired and often slavishly copied from French school drawings of ten, fifteen and twenty years ago. Buildings, too, which were precisely what they pretended not to be, illustrating nothing new in building and nothing new in art.

Having made the sketch and taken his *parti*, the student's duties henceforth, so far as the *projet* is concerned, lie at the atelier and with his *patron*. The system is a simple one. He goes to school, lays out his work, then takes it home to the atelier and completes it, always providing, however, the *patron* consents. If the *parti* is too bad, the *patron* will forbid his rendering or else advise him to boldly depart from the sketch and be placed *hors de concours*, on the theory that, as he

must lose in any case, it is better to do so with honour than ignominiously.

The relation between the *patron* and the pupil is a most intimate one. The very fact of the student's seeking admission to the atelier is an act of homage to the master, an assurance of sympathy and admiration on the part of the applicant. The *patron* takes an almost paternal interest in his pupils, and they on their part regard him with feelings of unbounded admiration. Their interests are the same, for the rivalry between the ateliers is not confined to the students alone. So close is the relationship between the school and the profession that a man's reputation, at least among his brother architects, depends largely upon the work of his pupils.

To the pupil the *patron's* door always stands open. No matter whom else may be denied admission, the pupil, be he never so poor, is sure of a cordial reception. On such occasions the *patron's* manner is most charming, but at the atelier small time is lost on ceremony. At his stated visits he passes from student to student without word or sign of recognition. He examines the work and expresses his opinion in words impossible to misunderstand. Praise is sparingly used and seldom goes beyond the expression *pas mal*. Upon occasions he indulges in ridicule and when the case requires, words of biting sarcasm bring the blood to one's face.

The *patrons* of all the great ateliers are members of the Academy of Fine Arts, and as such serve on the juries of the school. At the judgment the *patron* is always on hand, as well to defend the work of his pupils as to see that other ateliers do not carry off more than their legitimate share of honours.

I have had no personal experience with the *patrons* of other ateliers, but of Monsieur Blondel I can give an account.

He is a man about forty years old, handsome, of fine physique and dignified bearing; he has a keen blue eye which meets yours squarely. There is about him an air of manly decision well calculated to inspire confidence, and the evident and kindly interest he takes in those of his pupils who are in earnest soon wins for him their affectionate regard.

Wonderfully gifted by nature, he has besides at his command the resources of the most superb education in architecture which the Government of France can give. Moreover, he is a born instructor. He sees everything, forgets nothing, and decides with a precision and justness which excites the admiration of his pupils. He is as much interested in their work as they are themselves. Or at least he has to a remarkable degree the faculty of inspiring them with that belief. When he examines a design his eye takes in everything. No moulding so fine that he does not regard its contour, no *point de pochet* so small as to escape his notice. He is alike master of the noblest conceptions and the most refined detail.

His visits are the chief events of ordinary life at the atelier. As he enters a hush falls on the place which is not broken until his departure. As he approaches each student in turn the latter rises deferentially and stands aside while the *patron* seats himself on a *tabouret* and looks over the work.

At first I find these visits somewhat trying, for his criticisms are not complimentary. "Young man," he says, "this all looks old. I have seen that door at Verona, that window in Florence, that cornice in Rome. This is a compilation, not architecture but archæology. You are here to learn architecture, the noblest of the fine arts. It is not by compiling or copying even the greatest works of others that you can hope to succeed, but by learning to appreciate and to apply the principles that guided the designers." Monsieur Blondel is severe; he does not realise that I came from a place where it is considered highly respectable and eminently proper not only to steal parts of a design, but to reproduce European buildings entire, and palm them off as one's own.

He passes to another *nouveau*. This young man has been working for several days, has encountered many difficulties and is anxiously awaiting his criticism; he gets it, but not in the way he expects. The *patron* glances at his work but does not deign to seat himself. He says, "You do not know enough to draw an axis," then passes on. The lesson is short but not likely to be forgotten. The student has learned one of the fundamental laws of architectural design. Next time he will begin his work with the principal line.

How many practising architects here and in England need to be taught the same lesson.

The next student has been *en loge* and shows him his sketch.

"What is that," he says, "a church?"

"No, monsieur; a theatre."

"Oh! it's a theatre. Have you your mention in descriptive geometry?"

"No, monsieur."

"Devote your attention to that during the next two months."

In the atelier there are many strong men members of the first class, logists and some who have already received their diploma. From these one learns scarcely less than from the

patron himself, for they are ever ready to help and advise. They have spent years under the *patron's* eye and know his methods. It is interesting to see with what respect these men regard the master. His judgment is their final appeal. If they are masters of technique he is past grand-master. No man can do a thing so well but that he is ready to admit the *patron* can do it better. From the original conception to the finishing stroke of the *rendu* the *patron* stands unrivalled.

THEORETICAL TEACHERS OF ART.

THE Tyneside Sunday Lecture Society having invited Mr. Holman Hunt to lecture before them, the painter has sent the following reply to the Secretary:—

Draycott Lodge, Fulham, S.W.

Dear Sir,—I feel that it is an honour to be asked to lecture to the Tyneside Lecture Society, and I should have pleasure were it possible to do so; but I am obliged to manage my time very carefully now, that I may lose as little as possible from my painting; and to come to Newcastle during the season of your addresses would be a serious risk to my health and a great disturbance to my professional duties. Were I to speak on Art, my one strain from beginning to end would be to caution my audience in their judgment against the authority of the theoretical teachers, and to advise them to rely instead on their own best judgment. I imagine that their interest in the subject would be not as practical artists, but as men with a desire to cultivate a sound sense of appreciation for what is really capable of elevating the taste. For this there are many treacherous snares in the present day. Doctrinaires go about laying down dogmas—for instance, that all work should have moral teaching or that it should have none; that everything should be minutely finished or that it should be done as much as possible without exact elaboration; that everything should be idealised, or that nothing should be more than real, or different from the accidental fact. This is but a brief enumeration of the laws laid down by theorists, who are all wrong in making hard and fast rules. You will have heard of the different fashions of the day, and you will have seen some of the productions of the new schools. My advice is not to be taken in by any declaration that such a work is in the "correct style." If a work does not on sober examination give you the conviction that nature in that phase is sweeter or nobler than you thought before, it is not good for you, and do not be frightened out of your judgment, which on Art ought to enable you to decide on the value of a particular work as much as you can on other questions. Some delights are not lasting. Seek those that train the soul to love life, your fellow individuals and the community at large, and eschew all others.—

In haste, yours very faithfully,

W. HOLMAN HUNT.

GENERAL.

An Old English Fair has been opened at Bootle, in aid of the building fund for the proposed erection of a parochial hall in connection with St. Matthew's Church. The cost of the building is estimated to be about 3,000 guineas.

Mr. George G. Benn, Rugby, has offered a sum of 10,000/- for a new spire and peal of bells for the parish church.

The first of the ninth annual winter course of lectures in connection with the professional examination of the Surveyors' Institution will be delivered by Mr. Philip E. Pilditch, F.S.I., on Tuesday, October 2, at 7 P.M., for Associates, and on Friday, October 5, at 7 P.M., for Fellows, at 2 Duke Street, Charing Cross.

An Act has been passed by the legislature of Cape Colony for the registration of designs, and in its provisions mainly corresponds with the English law.

M. Martin, the engineer whose name is associated with the Westinghouse break, has died at Rouen.

The New School which is to be erected for the Cathcart School Board is to provide accommodation for 1,000 pupils, the allowance being 10 square feet of floorage for each. The cost is not to exceed 9/- per scholar, although a cookery-room and a swimming-pond will be provided. The following Glasgow architects have been invited to compete:—Mr. Robert Ewan, Messrs. Clark & Bell, Messrs. H. & D. Barclay, Mr. W. G. Rowan, Mr. D. McNaughton, and Mr. T. Watson, West Regent Street.

The Plans of Mr. T. Taliesin Rees have been selected in a limited competition for the Wesleyan Church and Schools, Bebington, and the carrying out of the work entrusted to him. The style of the buildings is Late Gothic. The materials are of red pressed bricks with white stone dressings and tracery. It is the intention of the committee at present only to erect the school chapel, which contains seating accommodation for 250 adults, minister's vestry, two class-rooms, kitchen, lavatories, &c. The future church has been arranged to seat 600 adults, with church parlour, vestries, organ-chamber, &c.

The Architect.

THE WEEK.

THE inquiries which were repeated at the meeting on Tuesday of the City Commission of Sewers, about the demands of one of the district surveyors for fees of two guineas each from shopkeepers in the City as a consequence of a free interpretation of the Sky Signs Act of 1891, are not likely to be heard when the new London Building Act comes into operation, for more care has been taken to define what a sky sign is and is not. It is an announcement which "shall be visible against the sky," and cannot therefore comprise "everything hanging from a shop-front," which Mr. MORTON, M.P., described as the interpretation of the surveyor. Moreover, the licenses for some existing sky signs are to be renewed for one further period of two years on their expiration, but not longer, and others for a second term of two years only. The duration is therefore brief. Fortunately, there are to be no successors to them within the metropolitan area, for, according to clause 127 of the new Building Act, "from and after the commencement of this Act it shall be unlawful to erect any sky sign as defined in this Act." The district surveyor whose conduct was discussed at the Commission of Sewers has been a public benefactor, for the demand for fees has been more effectual than any invective in convincing people that sky signs were a nuisance by which the purses of innocent people could be lightened.

A MEETING of sanitary inspectors was held in connection with the Congress at Liverpool on Wednesday, when the following resolution was unanimously adopted:—This meeting is of opinion that in the interest of the public health of the country (1) it is no longer expedient that appointments as medical officers of health, sanitary inspectors and inspectors of nuisances, should be made for definite periods of time. (2) It is desirable that the powers of the Local Government Board with regard to tenure of office should be extended so as to apply equally to all medical officers of health, sanitary inspectors and inspectors of nuisances, whether they be paid entirely out of local rates or not. (3) It is desirable that county councils should have the power of making representations to the Local Government Board either for or against the dismissal of such medical officers of health, sanitary inspectors and inspectors of nuisances, as are partly paid by such county council. And that the council of the Sanitary Institute be recommended to forward the resolution to the proper authorities." The information given to the meeting about the inadequate salaries paid to inspectors in Yorkshire, and which correspond with the amounts paid elsewhere, suggests the indifference in which sanitation is held by the majority of local authorities. It was found that in urban districts two received 4*l.* a year, one 5*l.*, four 6*l.* to 10*l.*, seventeen 20*l.* to 30*l.*, twenty 30*l.* to 40*l.*, seven 40*l.* to 50*l.*, six 50*l.* to 60*l.*, six 60*l.* to 70*l.*, four 70*l.* to 80*l.*, seven 80*l.* to 90*l.*, and ten from 100*l.* to 250*l.* Taking the rural authorities areas, two inspectors received 12*l.* to 20*l.*, two 20*l.* to 30*l.*, three 30*l.* to 40*l.*, five 40*l.* to 50*l.*, four 50*l.* to 60*l.*, two 60*l.* to 80*l.*, and thirteen whose salaries ranged from 80*l.* to 200*l.* To pay officers in that way is to put a premium on dishonesty, for poor men are likely to be tempted if bribes are offered to ignore breaches of the sanitary acts.

THE anecdote which Mr. HENRY IRVING related in an address he delivered at Walsall suggests the difficulties which sometimes arise when there is a departure from the letter of building regulations. Some time ago Mr. IRVING said he was tempted to make a little experiment on his own account, and without the invaluable advice of the authorities. To prevent crowding at the entrance to the Lyceum pit he set up a mechanical contrivance which compelled the people to wait in a line, and pass through the pit doors in single file. Strange to say, the public overwhelmed him with gratitude. The ingenuity and convenience of the contrivance were greatly admired, especially as it was

always moved away when the audience had taken their seats. He began to flatter himself that he had done the State some service. But this dream was soon over. There came a rather peremptory note one morning ordering him to remove the beautiful apparatus which was the public joy. When he sent a message of meek inquiry as to the rhyme or reason of this mandate, the answer was that the invention was dangerous to the public. With scrupulous delicacy the theatres committee had gone out of town, to avoid, no doubt, any risk of hurting his susceptibilities by consulting him in a matter on which he might venture to have an opinion; so he was left to wonder more than ever at the sublime intelligence which assumed that panics took place outside a theatre, and must be prevented by interdicting a successful device for making it easier to get inside. Mr. IRVING would, no doubt, be ready to admit that his contrivance if not removed would be as effective in preventing egress from his theatre. It is not impossible that some of his assistants would be forgetful and allow the contrivance to remain, and a panic might occur on that occasion as at any other time. The obstacle would therefore be a danger and as such the County Council were prudent to show disapproval of it. Temporary appliances are not contemplated in the parliamentary regulations for theatres, and it is hardly fair to cast any blame on the County Council, who have great but thankless responsibility.

By the new London Building Act, the County Council can at any time they may determine pay a district surveyor a salary instead of fees. The amount is to be not less than the average of the fees received in the preceding seven years. The fees which would have been payable to the surveyor are to be paid to the Council and carried to the credit of the County Fund. The Council may also provide either wholly or partially for the payment of salaries to the district surveyors or to any of them out of the fund, and may thereupon abolish or reduce any of the fees that are payable to the surveyors. Monthly returns are to be sent in by the district surveyors, which will be examined by the superintending architect, and "if any fees therein specified appear to him to be unauthorised, or to exceed in amount the fees so authorised, or if any such account appears to be in any respect fraudulent or incorrect, he shall make his report in writing to that effect to the Council, who shall thereupon take such steps in the matter as they deem expedient."

AN important arbitration case was opened before Mr. C. OAKLEY at the Surveyors' Institute. Mr. J. LOWTHER, M.P., as the trustee of the estate of the Earl of LONSDALE, claims 12,920*l.* from the Manchester Corporation for materials for easements taken over properties and damage to them arising from constructing through them the aqueduct and pipes which are to convey water from Thirlmere to Manchester. Stone and gravel used in the works are charged for at 1*s.* per cube yard, and stone which was used in spoil banks is charged at 2*s.* a yard. The easements are in some places valued at 4*s.* per yard per annum, but in prospective building land the value is put down at 2*s.* per yard for bridges and pipes, and 3*s.* a yard for works where the surface of the land was altered. For "wayleave" through underground property 100*l.* per mile is claimed.

By the death of Baron JEAN BAPTISTE BETHUNE, president of the Belgian Archaeological Society of St. Thomas and St. Luke, Belgium has lost one of its greatest archaeologists and the Society of Architects of this country a most distinguished honorary member. Baron BETHUNE was a Knight Commander of the Order of St. Gregory the Great, a Knight of the Order of Leopold, vice-president of the chief Belgian antiquarian societies, and honorary member of many continental societies devoted to archaeological research. In early life Baron BETHUNE was attached to the Belgian Legation in London. He visited England last year, when he attended a soirée given by the Society of Architects and testified in an eloquent speech to the admiration for English architecture which his fellow-countrymen possessed.

THE LONDON BUILDING ACT, 1894.

THE new Act, which supersedes several Metropolitan Building Acts as well as other Acts relating to London, consists of sixteen parts and two hundred and eighteen clauses, besides schedules referring to dimensions, materials, fees, &c. It will come into operation on the first day of next year.

The first part is introductory, and contains definitions of expressions which are more numerous than in the preceding Building Acts. In some cases the old definitions are retained. In others there are alterations. For instance, there are two definitions of "party wall." It is "a wall forming part of a building and used, or constructed to be used, for separation of adjoining buildings belonging to different owners, or occupied or constructed or adapted to be occupied by different persons." It is also "a wall forming part of a building and standing to a greater extent than the projection of the footings on lands of different owners." Among the public buildings is comprised "a building used or constructed or adapted to be used as an hotel, lodging-house, home, refuge or shelter where such building extends to more than 250,000 cubic feet, or has sleeping accommodation for more than one hundred persons." As in the older Acts, there is no recognition of architects, with the exception of the Council's superintending architect. All the procedure can be carried out if necessary by the building owners or builders.

The second part contains the clauses relating to

Formation and Widening of Streets.

Before any street for carriage or foot traffic is formed or laid out it will be necessary to make application to the Council, accompanied by plans, sections and other particulars described in printed regulations, and to obtain their sanction. The erection of a fence or other boundary, laying down kerbing, levelling ground to define direction, or forming foundation of a house which will become one of three or more abutting on line of proposed street, will be deemed evidence of commencement of street.

The sanction of plans of streets can be refused on seven grounds, viz. if a street proposed for carriage traffic has not a clear width of 40 feet, or one for foot traffic a width of 20 feet; or if a street over 60 feet in length, or of less length than 60 feet where the length exceeds the width, is not open at both ends; or if a street does not afford direct communication between two other streets; or if a street laid out for foot traffic does not appear desirable, or if the gradient for carriage traffic is steeper than 1 in 20; or if the proposed street would contravene any by-law. A refusal or conditional sanctioning is to be made known by notice to the applicant within two months, and the reasons are to be stated fully by the Council. If within two months the Council fail to give notice of their refusal or disapproval, they are to be deemed as having sanctioned the proposal.

Similar procedure is required in cases of adapting streets or ways for carriage traffic which were previously not suited for that purpose. The grounds for refusing to sanction adaptation of ways for streets also correspond with those described for new streets. Greater width of street may be required by the Council in cases of new streets or adapted streets not being within two miles of St. Paul's Cathedral, if it be considered that the street or streets are likely to form part of an important line of communication or for other sufficient reason. In no case, however, is a greater width than 60 feet to be required. The local authority can make a representation to the Council on the subject before any demand for exceeding 40 feet width is made.

The distance between the external walls of buildings or the external fence or boundary of forecourts and the centre of the roadway is to be at least 20 feet clear. In cases where extraordinary width is required in streets the Council can determine that the prescribed distance of the buildings shall be up to 30 feet clear on either side or both sides. Any person who is dissatisfied with the departure from the 20-feet distance may appeal to the Tribunal of Appeal that is created by Act. The Council reserve the right to consent to the erection, formation, or extension of any building, forecourt, or space at a distance less than the prescribed distance from the centre of the roadway, and subject to such conditions as may be imposed. But it is

provided that such consent shall not in any way affect any rights of the owners of adjoining land. Whenever any person intends to alter or re-erect an existing building or which did exist within seven years prior to January 1, 1895, and which is not in conformity with the provisions of the new Act, then plans are to be prepared (or the best plan available is to be produced), which are to be submitted to the district surveyor. If he testifies to their accuracy it shall be lawful to erect such building or structure, provided there is no deviation from the former limits. But if plans are not submitted and certified the provisions of the new Act will apply. It is stipulated, however, that no dwelling-house for the working classes is, without the consent of the Council, to be erected or converted within the prescribed distance from centre of roadway to a height exceeding the distance of the front wall from the opposite side of the street. Where a new building is erected within the prescribed distance without compliance with the conditions (if any) imposed by the Council or Tribunal of Appeal, notice is to be served on the owner, occupier, or builder, requiring the setting back of all parts which are in excess.

In any case where a greater width than 40 feet or more than 20 feet from centre of roadway is prescribed, the Council shall be liable to pay compensation for loss or injury to the owner of the land or buildings.

If buildings are erected at less than prescribed distance from centre of roadway, or if the conditions of Council or Tribunal of Appeal are not obeyed, the street shall not become a highway unless the parts in excess are set back according to a notice delivered by the Council in return for one proposing to making the way a public highway. The Council can sanction the construction of new buildings at less than the prescribed distance in such cases as they may think proper, provided the rights of owners of adjoining lands are not affected.

The third part deals with

Lines of Building Frontage.

Without the consent of the Council in writing no building is to be erected beyond the general line of buildings on a street unless the same line exceeds 50 feet in distance from the highway, but the section is not applicable in cases where a building stood on January 1, 1895, or any time within seven years previously. When any buildings projecting beyond the general line are taken down or destroyed by fire or other casualty to the extent of one-half the cubical area, the Council can require the buildings to be set back to the line, compensation being paid to the owner.

The general line is to be defined by the superintending architect in a certificate which is to be served on those to whom it relates, and the local authority, or any person deeming himself aggrieved, can appeal against it to the Tribunal of Appeal. In consenting to any departure from the general line the Council may require that the land in front of the building is dedicated to public use, or that the building shall be used for specified purposes alone, or any other condition which the Council may deem it expedient to propose in the public interest. Consent respecting one part of a line does not apply to the remaining parts. This part of the Act does not apply within the City.

The fourth part relates to

Naming and Numbering of Streets.

The names proposed for streets are to be submitted for the approval of the Council. The names are to be affixed and renewed by the local authority. The Council can alter the name of any street, but notice is to be given a month beforehand, and objections will be considered. The numbering of houses can also be ordered. Power is reserved that, in default of the local authority complying with the order, the Council may perform all such proceedings as are necessary in connection with the naming and numbering of streets. A register is to be kept for public inspection showing all alterations made in the naming or numbering of streets.

The fifth part is a "new departure," for it contains the enactments for

Open Spaces about Buildings and Heights of Buildings.

All domestic buildings erected after January 1, 1895 (exclusive of those used or constructed or adapted wholly or principally as offices or counting-houses), having habit-

able basements, are to have in the rear an open space of not less than 100 square feet for the purpose of giving light to such basement.

Every domestic building abutting upon a street formed or laid out after the commencement of the Act, is to have in the rear an open space of not less than 150 square feet. Where there is a basement storey with the prescribed 100 square feet of open area,

irrespective of any use to which the ground storey is appropriated, or where there is no such basement storey, but where the ground storey is not constructed or adapted to be inhabited, the open space required by this section may be provided above the level of the ceiling of the ground storey, or a level of 16 feet exclusive of lantern lights measured from the level of the adjoining pavement. In all other cases the open space shall be free from any erection thereon above the level of the adjoining pavement, except a water-closet, earth-closet or privy, and a receptacle for ashes, and enclosing walls, none of which erections shall exceed 9 feet in height. Such open space shall extend throughout the entire width of such building, and to a depth in every part of at least 10 feet from such building.

The relation between the height of a building and the open space in the rear is to be ascertained as follows:—
1. A horizontal line is to be drawn at right angles to the roadway, and at pavement level in ordinary cases, through the centre of the face of the building until it intersects the furthest boundary of the open space. 2. A diagonal line is then to be drawn in the same vertical plane with the horizontal line and inclined thereto at an angle of $63\frac{1}{2}$ deg., and meeting the horizontal line where it intersects the boundary of the space furthest removed from the roadway. With the exception of chimneys, dormers, gables, turrets or other architectural ornaments, aggregating in all to not more than a third of the width of the rear elevation, no part of a building is to extend above the diagonal line. Where the pavement in front is not level the mean level of the pavement is to be adopted, and where the rear boundary is not parallel with the rear wall of the building, the mean distance is to be adopted. If the boundary is very irregular, application for advice is to be made to the Council or if necessary to the Tribunal of Appeal. If the land at rear abuts on a street or public space, the horizontal line is to be produced and the diagonal line may be drawn from a point at the centre of the roadway of such street or at the further boundary of such space, "and it shall not be necessary to provide any open space at the rear of such building." In case of sites at a corner abutting on two streets, or on a street and an open space not less than 40 feet wide, the Council may permit the erection of buildings up to 30 feet in height upon such part of the rear as they think fit, provided they do not interfere unduly with the access of light and air to the neighbouring buildings. A building on a corner site can be carried up to the full height of the front elevation for a distance of 40 feet on the return front, or for such less distance as the requirements for open space at the rear may demand. With sites of irregular shape the Council may allow modifications subject to appeal to the Tribunal.

When buildings abut on old streets the horizontal line is not to be drawn on pavement level but 16 feet above it (except in case of houses to be inhabited by persons of the working class), and the prescribed open space may be provided above the level of the ceiling of the ground storey or above a level of 16 feet (exclusive of lantern lights) above the level of the adjoining pavement.

A building may extend beyond the diagonal line if the Council or Tribunal shall be satisfied that an equivalent open cubic space of air will be provided at the rear. The section is not applicable to houses abutting on the river Thames, on a public park, or on an open public space of not less than 80 feet in depth.

Special provisions are likely to be enforced for working-class dwellings which do not abut upon a street. After the plans are delivered, which, it is presumed, will correspond with the general regulations for domestic buildings, the Council can refuse to sanction them if they are satisfied, "taking all the circumstances of the case into consideration, that there will not be provided about such dwelling-house a sufficient open space or spaces for the admission of light and air thereto." Without the sanction the dwellings are not to be commenced.

Houses on old sites can be re-erected after the plans

showing former state are verified by the district surveyor, "so that no more land shall be occupied by the newly-erected building than was occupied by the previously-existing domestic building as so certified." Some deviations may be permitted if the Council think fit. The Council may also modify or relax the provisions of the section in respect of new streets on a cleared area.

In courts within a building there is to be adequate provision for ventilation by means of a communication between the lower end of the court and the open air. No habitable room having a window opening into the court is to be constructed unless there is one also directly opening into the external air, or unless the width of the court from the window to the opposite wall shall be equal to half the height measured from the sill to the eaves or top of parapet of opposite wall. A court of which the greater dimension does not exceed twice the less dimension shall be held to comply with the section, if a court of the same area but square in shape would comply therewith. "No habitable room above the level of the ground storey not having a window opening into the external air otherwise than into a court open on one side, the depth whereof measured from the open side exceeds twice the width, shall be constructed in any building unless every window of such room be placed not nearer to the opposite wall of such court or to any other building than one-half the height of the top of such wall or building above the level of the sill of such window." When necessary the superintending architect may define front or rear of buildings.

A building (not being a church or chapel) is not to be erected, or subsequently increased, to a greater height than 80 feet (exclusive of two storeys in the roof and of ornamental towers, turrets, or other architectural features) without the consent of the Council. Contracts entered into before 1895 for buildings of greater height can, however, be carried out. Higher buildings existing before 1895 can also be re-erected without diminution of height. If part of a continuous block or row exceed the 80 feet, any of the other buildings can be raised to the height of that part. Where greater height is allowed, notice of Council's consent is to be published, and the consent is not to be valid until twenty-one days have lapsed from publication. An owner or lessee of a building or land within 100 yards of the intended high building can appeal to the Tribunal.

In streets laid out after August 7, 1862, which have less width than 50 feet, no existing building except a church or chapel is to be raised, and no new building erected of greater height than the width from the external wall to the opposite side of street, without the consent of Council. On corner sites the height is to be determined by the width of the wider street so far as the building abuts on the narrower street for a distance of 40 feet. Existing buildings of greater height may be re-erected to that height. The height of buildings can be likewise increased to such an extent as may be necessary to bring habitable rooms in the topmost storey into conformity with the provisions of the Act. Working-class dwellings can be re-erected by a local authority and retain former dimensions. Domestic buildings with stables in the rear, on sites with a depth of not more than 150 feet, if the stables are limited to a depth of 50 feet and a height of 25 feet may be deemed to be one domestic building with the rear abutting upon the street.

In the sixth part we arrive at the important subject of

Construction of Buildings.

The structure and thickness of walls is defined in the schedules, which we give elsewhere. The regulations upon recesses and openings correspond with those in the Act of 1855, excepting that recesses in party walls are not to come within $13\frac{1}{2}$ inches of the inner face of the external walls, instead of 12 inches, and that the arch over one of those recesses is on each storey to consist of at least two rings of brickwork of the full depth of the recess, except in the case of recesses formed for lifts. Where the recess does not exceed 5 inches in depth, corbelling in brick or stone may be substituted for the arching. The superintending architect has the power to consent to modifications or relaxations of the section with respect to the area of recesses and openings.

Loophole frames were allowed to be fixed within $1\frac{1}{2}$ inch of the face of any external wall; henceforth they

can be made flush with the face, and so can frames of doors and windows. As formerly, timber in external walls, with the exception of bressummers, storey-posts, frames of doors and windows of shops, are to be set back 4 inches from the external face of the wall.

The bearing of wood or metal bressummers is to be 4 inches at each end, as before, but the ends of wooden bressummers can come within 4 inches of the centre-line of party walls instead of $4\frac{1}{2}$ inches. A space for expansion calculated at a $\frac{1}{4}$ inch for every 10 feet or fraction of 10 feet is to be allowed at each end of a metallic bressummer. A bond of timber or wood-plate built into a party wall, and the ends of any beam or joist resting on party walls, may be 4 inches from the centre-line instead of $4\frac{1}{2}$ inches. The rule about the templet or corbel for a bressummer bearing on a party wall is unaltered. "The end of any timber not permitted to be placed in or to have a bearing on a party wall may be carried on a corbel or templet of stone or iron or vitrified stoneware tailed into the wall to a distance of at least $8\frac{1}{2}$ inches, or otherwise supported to the satisfaction of the district surveyor." The rule about gutters and parapets to external walls is unaltered.

A wall is to be deemed a party wall for such part of its length as is so used when, after January 1, 1895, it is built as a party wall in any part, or where one built at any earlier time becomes a party wall.

In warehouses party walls are to be carried up above roof at least 3 feet and of a thickness equal to the thickness of the wall in the topmost storey, and in other buildings 15 inches above the flat or gutter of the highest building adjoining, or measured at right angles to the slope of the roof, the thickness being $8\frac{1}{2}$ inches. If there is any turret, dormer, lantern-light or erection of combustible materials on the roof within 4 feet of the party wall, the wall is to be at least 12 inches higher and wider on each side than such erection.

The rule for chases in party walls corresponds with that of 1855. No chase is to be wider than 14 inches, nor more than $4\frac{1}{2}$ inches deep from the face, nor so as to leave less than $8\frac{1}{2}$ inches thickness at the back or opposite side, and no chase is to come within a distance of 7 feet from any other chase on the same side or within 13 inches from an external wall. No chase is to be made on a wall of less thickness than 13 inches.

Flats, gutters and roofs and erections thereon are to be covered externally with incombustible materials, except doors, windows, barge-boards, &c., which may be of wood. Buildings above 30 feet high used wholly or partially as dwelling-houses or factories are to be provided with proper means of access to the roof. As before, the plane of the surface of warehouse roofs is not to exceed 47 deg.; in other buildings it is not to exceed 75 deg. Towers, turrets and spires are not included. Not more than two storeys are to be constructed in the roof of any domestic building. If the floor is at a height of more than 60 feet from the street level, it is to be constructed of fire-resisting materials. Every building exceeding 60 feet in height is to be provided with means of escape from the upper part in case of fire, and the building is not to be occupied until a certificate of the existence of that provision is issued by the Council.

There are some variations from the former Act in the rules for chimneys and flues. Chimneys are allowed to be "carried upon iron girders with direct bearings upon party, external or cross walls to the satisfaction of the district surveyor." Chimneys and flues could be constructed at any angle if there were proper soot doors of 6 inches square; henceforth the doors are to be not less than 40 square inches. It used to be said, "in every other chimney or flue the angles shall be constructed of an obtuseness of not less than 130 deg. and shall be properly rounded." The new rule is, "chimneys and flues having proper soot-doors of not less than 40 square inches, but in no other case shall any flue be inclined at a less angle than 45 deg. to the horizon, and every angle shall be properly rounded." The abutments or chimney-breasts projecting more than $4\frac{1}{2}$ inches had to be tied; by the new Act the abutments must be tied if the projection exceeds 4 inches. A flue in connection with a boiler or close fire used for trade or business, or the range or cooking apparatus in a hotel, tavern or eating-house, will be

illegal unless it is surrounded with brickwork at least $8\frac{1}{2}$ inches thick from the floor on which the boiler or apparatus is situate to the level of the ceiling of the room next above the same. Flues used in connection with steam boilers or hot-air engines must be at least 20 feet in height measured from the floor on which the engine stands. The inside of every flue and the outside when passing through any floor or roof, or behind or against any woodwork, must be rendered, pargetted or lined with fire-resisting piping of stoneware. The position and course of every flue must be distinguished on the outside of the work. The regulations numbered from 5 to 17 of clause 19 in the Act of 1855 are adopted with a few slight changes. For instance, slabs of fireplaces, which were required to be 12 inches longer than the opening, need not be more than 6 inches longer. Slabs or hearths may be 6 inches thick instead of 7 inches. Timber could not be placed within 18 inches of the surface of the hearth; the new rule is "within 10 inches from the upper surface of the hearth." The highest six courses of every chimney-shaft or stack are to be built in cement.

Furnace chimney-shafts are to be in the best brickwork and mortar, and if detached are to taper at least $2\frac{1}{2}$ inches in 10 feet. The brickwork for the uppermost 20 feet is to be at least $8\frac{1}{2}$ inches thick, and is to be increased at least one-half brick for every additional 20 feet measured downwards. Every cap, cornice or other variation from plain brickwork is to be provided as additional to the brickwork; the cap and foundation are to be constructed to the satisfaction of the district surveyor. The width of a square shaft at base is to be at least a tenth of the height, and of a round or other shape a twelfth of the height. Firebricks inside the lower portion of the shaft are to be additional to the prescribed thickness of brickwork, with which they are not to be bonded.

Floors under ovens, coppers, steam boilers or stoves, and which are not heated by gas, are to be formed of incombustible and non-conducting materials 6 inches thick placed around for a space of 18 inches. Pipes for conveying products of combustion, heated air, steam or hot-water are not to be fixed on the face of a building adjoining street. A pipe conveying smoke or other products of combustion is not to be placed nearer than 9 inches to any combustible material; for heated-air pipes the distance is 6 inches, and hot-water pipes 3 inches, unless in the case of pipes for conveying water and steam at low-pressure. The floor of any room or enclosed space in which a furnace is fixed and any floor within 18 inches from the crown of an oven is to be fire-resisting.

In every public building and building of more than 125,000 cubic feet in extent which is to be used for separate families, floors of lobbies, corridors, passages, landings and the flights of stairs are to be fire-resisting and supported by a fire-resisting material.

The principal staircase is to be ventilated on every storey above ground storey of every building occupied by more than two families by means of windows or skylights or other adequate means, and the principal staircase in every dwelling-house is also to be ventilated by windows or skylights. Habitable rooms, unless wholly or partially in the roof, are to be at least 8 feet 6 inches from floor to ceiling. Those in roof are to be 8 feet high throughout not less than half the area. Every room is to have one or more windows opening into the external air with an unobstructed area, exclusive of sash frames, of at least one-tenth of the floor area of the room, and a part equal to at least one-twentieth of the floor area capable of opening. In rooms lighted wholly or partially from the roof the window area is to be at least one-twelfth of the floor area and the part to open one twenty-fourth of that area. Basements with wooden floors are to have air-bricks or other ventilators. A room for habitation over a stable is to have a floor of concrete 3 inches thick finished smooth, and the staircase or other approach is to be separated from the stable by a wall of 9-inch brick.

Every party arch over a public way or any passage under a building is to be of brick, stone or other incombustible materials. In the case of brick and stone the thickness is to be $8\frac{1}{2}$ inches, with a rise of an inch per foot; and if other material the arch is to be constructed to the approval of the district surveyor. Arches under public ways up to 10 feet span are to be $8\frac{1}{2}$ inches thick, up to 15 feet span

13 inches; and when the span is greater the thickness is to be as district surveyor shall approve.

Every coping, cornice, string-course, fascia, window-dressing, portico, porch, balcony, verandah, balustrade, outside landing, outside stairs, outside steps and architectural projection or decoration, also the eaves, barge-boards and cornices to any overhanging roof—with the exception of cornices and dressings to shop window-fronts and eaves, barge-boards and cornices to detached and semi-detached dwelling-houses with party walls projecting 4 inches beyond them—are to be of brick, tile, stone, artificial stone, slate, cement, or other fireproof material. Every balcony, cornice, or other projection is to be tailed into the wall and weighted or tied down to the satisfaction of the district surveyor. No cornice is to project more than 2 feet 6 inches over public way. In streets which are 30 feet wide and under, a shop front may project 5 inches beyond the external wall and its cornice 13 inches, and in streets of greater width the projection of front may be 10 inches, and of cornice 18 inches. No part of the wood-work of a shop-front is to be higher than 25 feet above the pavement or to be nearer than 4 inches to the centre of the party wall or face of separate wall belonging to adjoining premises, unless a pier or corbel 4 inches wide is placed as high as the woodwork and projects an inch between wood-work and wall.

In streets not less than 40 feet wide bay windows can be erected provided that they do not exceed three storeys in height above the footway, do not project more than 3 feet from the main wall of the building, or in any part do not project within the prescribed distance of the centre of the roadway, are in no part nearer to the centre of the nearest party wall than the extreme amount of their projection from the main wall of the building, do not, when taken together, exceed in width three-fifths of the frontage of the building, are not constructed upon the public way and are not to be used for trade purposes.

Projecting oriel windows or turrets can be constructed in streets not less than 40 feet wide, provided that they do not project more than 3 feet from the building, or more than 12 inches over the public way, that no part is less than 10 feet above the footway, or within 4 feet of the centre of the nearest party wall, and that on no floor shall the total width exceed three-fifths of the length of the wall of the building on the level of that floor.

Roofs, balconies, verandahs, shop fronts, &c., are to be so arranged and supplied with gutters as to prevent the water from dropping or running over any public way. Every building is to be separated from the adjoining building or buildings either by a party wall or walls or by other party structure. In every building exceeding ten squares in area, used partly for trade and partly for a dwelling-house, the former part is to be separated from the latter by walls and floors of fire-resisting materials, as well as the passages, staircases, and other means of approach to the dwelling-house part. Doorways may be constructed in the walls of staircases and passages and openings in the walls, if fitted with fire-resisting doors. Every building exceeding twenty-five squares in area, containing separate sets of chambers or offices, is to have floors and principal staircases of fire-resisting materials. It is announced that the provision does not entitle the district surveyor to charge for the inspection of each set of chambers as a separate building.

A building of the warehouse class is not to extend to more than 250,000 cubic feet, unless divided by party walls in such manner that no division extends to more than that capacity. No addition is to be made to the warehouse or any of its divisions by which the 250,000 cubic feet shall be exceeded. The restriction does not apply to buildings which are more than two miles distance from St. Paul's Cathedral, and are used wholly for the manufacture of machines and boilers of steam-vessels and retort-houses, provided they consist of one floor only and are constructed of brick, stone, iron or other incombustible material.

Where the Council are satisfied that additional cubical content is necessary for any building, and that the risks of fire will not be increased, they can allow of the increase provided that the building does not extend beyond 450,000 cubic feet, or any less number allowed, without being divided by party walls; that the height does not exceed 60 feet, and that the building is not used for any trade or

manufacture involving the use of explosive or inflammable materials. The consent is only to avail as long as the purpose of the building is unchanged.

The rules for the uniting of buildings nearly correspond with those in force since 1855. As much may be said about the clause relating to the construction of public buildings, with the exception that the Tribunal of Appeal will take the place of the Metropolitan Board of Works in case of disagreement between the owner and the district surveyor.

One clause deals with staircases in churches, chapels and other public places of assembly. Every staircase for the use of the public is to be supported and enclosed by brick walls not less than 9 inches thick. The treads are to be of uniform width. No staircase, corridor or passage is to be less than 4 feet 6 inches wide, but if not more than 200 persons are to be accommodated in the building the width may be reduced to 3 feet 6 inches. If there is accommodation for more than 400 the width is to be increased by 6 inches for every additional 100 persons until a maximum width of 9 feet be obtained. Staircases that are 6 feet wide and upwards are to be divided by a handrail. Instead of a single staircase two can be substituted with corridors and passages, each having two-thirds of the width of the single staircases and passages, but neither of the substituted stairs, corridors and passage ways is to be less than 3 feet 6 inches. In all cases where a portion of the public is to be accommodated at a higher level, a separate means of exit from each floor or level to the street or open space is to be provided. All doors and barriers shall be made to open outwards, and no outside locks or bolts are to be affixed thereto.

The foregoing abstract represents the parts of the New London Building Act which have most interest for architects. The parts about "Special and Temporary Buildings and Wooden Structures," "Rights of Building and Adjoining Owners," "Dangerous and Neglected Structures," "Dangerous and Noxious Businesses," "Dwelling-houses on Low-lying Land," "Sky Signs," "Superintending Architects and District Surveyors," "By-laws," "Legal Proceedings" and "Miscellaneous" have a different character. The Act will introduce several changes, but it will neither be as revolutionary nor as obstructive as it has been represented. Whatever may be the shortcomings of the clauses which time will reveal, the duty of architects and builders is to carry out the provisions loyally, and we have no doubt in that way London will be safer from fire, more convenient and healthier than heretofore.

KILDARE ARCHÆOLOGICAL SOCIETY.

THE annual excursion meeting of the members of the county Kildare Archæological Society has just taken place. The districts chosen were Castledermot and Kilkea, and the various matters of deep archæological interest which were brought under the notice of the members of the Society and the visitors, coupled with the fine weather and other favouring circumstances, tended to make the day's outing a pleasant one at the ruins of the Franciscan Abbey at Castledermot.

Rev. Dr. Comerford, coadjutor bishop of Kildare and Leighlin, read a paper on the history and antiquities of Castledermot. He said that like so many other towns in Ireland and elsewhere Castledermot owed its origin to a religious house which flourished there from an early period. About A.D. 500 St. Diarmuid, a holy recluse, chose the place for his hermitage, and from him it came to be named Disert Diarmada, afterwards changed to Tristledermot. St. Diarmuid was registered in the martyrology of Tallaght at the 21st of June, the day on which his feast was celebrated. The place in succeeding centuries was distinguished as a place of learning. His lordship traced at considerable length the history of Castledermot, which was several times seized by contending forces. After the battle of the Boyne, King William and his army on their way to Limerick reached Castledermot on August 14, and there he received the news of the defeat of his fleet by the French off Beachy Head. In 1734 a Charter school was founded at Castledermot, being the first erected in Ireland. In the reign of King John a priory of Crouched Friars was founded there by Walter de Riddlesford. It was situated without the town walls and adjoining the road which led to Dublin. The only portion of this monastery now remaining was a square tower, which Lord Walter Fitzgerald informed him stood in a field called the Pigeon House Park, to the north of the town. It was 39 feet high in its present state; each of the sides measured about 15 feet

and were $3\frac{1}{2}$ feet thick. Of the rest of the building there was no trace above ground, though extensive foundations were met with under the surface. Some few perches to the north-west of the tower an underground chamber was accidentally discovered a few years ago by a horse, which when ploughing put his foot through the vaulted roof. It had not as yet been explored. In 1302 a monastery for conventual Franciscans was founded in Castledermot by Thomas Lord Offaly. Considerable remains of the monastery still existed, though greatly reduced and mutilated, even within the memory of persons still living. Attached to the friary was another chapel dedicated to St. James, the patron of the district, of which one gable and portion of a sidewall remained. From under the site of the altar flowed St. James's well, which a late parish priest diverted to the other side of the gable. The Protestant church and the burial-ground surrounding it occupied the site of the original hermitage of St. Diarmuid and the monastery which sprang up around it. An ancient round tower at Castledermot had been already described in the *Journal of the Society*. It was $66\frac{1}{2}$ feet high; its doorway, which, contrary to the usual custom, was only slightly above the ground level, was square-headed, the jambs inclining towards each other at the top. Portions of these had been hacked away, probably for the admission of the bell placed in it in the last century. A considerable portion of the old church was in existence up to a comparatively recent date. At present, except such portions as were incorporated in the existing church, nothing remained but the beautiful Romanesque western doorway with its chevron decoration. Two high Celtic crosses stood in the burial-ground. Both were richly sculptured, the subjects being as usual Scriptural and religious, including, besides the central figure of the Crucifixion, David playing the harp, the sacrifice of Isaac, Adam and Eve in the Garden, the meeting between St. Anthony and St. Paul the first hermit, the multiplication of the loaves and fishes, the Twelve Apostles, &c. The tradition of the locality was that Abbot Cairpre, who died in 919 after a long life, and probably also a long tenure of office, built the round tower and the church and erected the crosses. A rude circular granite font formerly belonging to this church was rescued from being used as a drinking trough for cattle on the adjoining farm, and now lay within the ruins of the Franciscan abbey. It was not pierced. A granite stone, $2\frac{1}{2}$ feet in height above ground, stood in the graveyard. It had a Celtic cross engraved on it running its whole length, the peculiarity of which in this case was that what would have been the circle of the cross was a round hole 5 inches in diameter pierced right through. In 1863 some labourers dug up in a field near the town a very interesting relic of the past—an old Irish ecclesiastical bell of bronze. It was of the usual oblong shape, with some attempt at ornamentation in the casting. It was $6\frac{3}{4}$ inches high, and measured at the base $4\frac{1}{2}$ inches by 3 inches. In 1889 it came into the possession of the Leinster family, and was preserved at Kilkea Castle. In conclusion, his lordship said that in preparing the paper use had been made of valuable notes kindly placed at his service by Lord Walter Fitzgerald.

On the motion of the Earl of Mayo a vote of thanks was passed to Dr. Comerford.

The party then proceeded to the church, where the round tower, the two Celtic crosses and the "hole stone" were inspected. Miss Margaret Stokes entered on a minute and interesting description of the Celtic crosses, pointing out and explaining the figures and incidents sculptured on them. Lord Walter Fitzgerald gave an interesting explanation of the round tower.

A cordial vote of thanks was passed to Miss Stokes and to Lord Walter Fitzgerald. The party afterwards partook of luncheon in the adjoining schoolhouse, the catering being done by the Leinster Arms Hotel.

A start was next made for Kilkea Castle. On arriving on the grounds the Rev. C. W. Ganly read a paper on Kilkea Castle. He said the ancient district in which the castle stood was known in the twelfth century as O'Murethi, and was the property of the O'Toole Sept, to which the famous St. Laurence O'Toole belonged. Kilkea Castle was so called from the church now in ruins beside it. In old histories and documents the spelling of the name differed very much, the usual forms being Kileka, Kylka and Kilka. All these were a corruption of the Irish name "Cill Caside," meaning St. Caside's or Kay's Church. After the Norman invasion the south end of co. Clare was granted by Strongbow to Walter de Ridlesford, Baron of Bray, who evicted the Sept O'Toole, forcing them to retire to the Wicklow Mountains. In 1180 a castle was built at Kilkea for De Ridlesford by Hugh de Lacy, Earl of Ulster, at that time chief governor of Ireland. De Ridlesford's granddaughter, Emelina, heiress through her mother of the O'Murethi district, married Maurice Fitzgerald, third Baron of Offaly, and thus the manors of Kilkea and Castledermot came into, and still remained in, the possession of the Geraldines. In 1426 the castle, which had probably been sacked by the Irish, was restored and enlarged by John Fitzgerald, sixth Earl of Kildare. Its situation made it a place of

importance, as it was built in the marshes, the ground intervening between the native Irish territories and the Pale. Owing to its position it must have passed through years of unrecorded attacks. In 1573 the eleventh earl repaired the castle, and placed in the dining-hall a limestone chimney-piece, of which three sculptured stones remained. In 1797 the notorious '98 informer, Thomas Reynolds, obtained a lease of the castle and lands through the interest of Lord Edward Fitzgerald, when the castle appeared to have been partially repaired and furnished.

Rev. Mr. Ganly enumerated the features of special interest in the castle. First, there was the "evil-eye stone," which was built 17 feet above the ground into the quoin of the guard-room. Secondly, there was the hall door, which was the main entrance into the castle, consisting of an outer arch and an inner Pointed arched doorway. Thirdly, there was the haunted room, situated in the upper portion of the wing projecting from the round flagstaff tower. There it was said that Gerald, the eleventh Earl of Kildare, practised the Black Art, which earned for him the name of the "Wizard Earl." While it was gratifying to them to stand there on such historic ground and under the shadow of the venerable castle, it was doubly so when they found themselves the guests of the lineal descendants of the great family of the Geraldines and Fitzgeralds, and it added additional pleasure to the visit there since it was the house of one of the hon. secs., Lord Walter Fitzgerald, than whom in this country there was no more devoted student of archaeology.

A vote of thanks was passed to the Rev. Mr. Ganly.

The party was afterwards shown over the castle, where they were entertained to tea by the Ladies Fitzgerald.

TESSERÆ.

Egyptian Columns.

THE columns of the Egyptians are generally round in form up the greater part of the shaft; in general their width bears a much greater ratio to their height than in Grecian buildings, and this imparts to them a greater degree of heaviness. In some columns the surface is sculptured with representations of the lotus-leaf, in others it is made to appear like a bundle of rods fastened together by hoops, while others are diversified in form in various ways. It is supposed that one of these forms was intended to imitate the use of a number of Thebaic palm trees bound together to furnish a support. Some few pillars are of the same diameter all the way up. Square columns are found in the tombs, and others are found in some of the temples. Some of the square pillars exhibit caryatid figures on one of their sides, projecting more or less boldly from the face of the stone, and seeming to support a weight aloft. In the court of one temple there is a row of eight huge square pillars, measuring 8 feet in width on each face, and on one side of each pillar there is a caryatid figure standing on a pedestal of its own. The form of the capital of an Egyptian column, and the relation in size and appearance which it bears to the shaft, vary exceedingly. At Denderah the sculptured devices of the capital are exceedingly curious. In the majority of cases, however, the capitals are much more graceful. It has been remarked that the most common form of the capital is that of the calyx of a plant, probably that of the lotus, which in the religious system, as well as in the daily economy of the ancient Egyptians, was a most important element. This simple and graceful form has received, however, many modifications at the hands of the Egyptian mason, who appears not to have been at all deficient in taste in his selection of the natural models, nor in the power of adapting them to the purposes of architectural ornament. In other capitals the design has been probably taken from the gracefully hanging palm leaves, as they appear at the top of the trunk bending down on all sides. The general character of the capital is borrowed from the cup of a flower; in some cases the top or outer ring is exactly circular, in others the circle is broken into a number of curved lines with their convexities turned outwards, thus forming a series of beautifully bending petals. On the outer surface of these graceful bends various ornaments are cut encircling the whole capital. We have the bulrush, with its stem and leaves, and the palm-branch, with its leaves and fruit, and the calyx of the lotus-flower grouped with the leaves of the same plant, and the rounded tuft-like head of the palm before it is expanded in spring, and the lotus again, with its flower alternately in the bud and full bloom, and we also see the vine, with its shoots and leaves intermingled with those of the palm tree. The capital of some Egyptian columns appears like several small pillars or shafts grouped together so as to show only their outer surfaces, terminated at the top by an abacus or dé and at the bottom by something like the cup of a flower.

The Choragic Monument, Athens.

The wealthy Greeks were in the habit of giving theatrical or musical entertainments, in which the performers contended with each other for the prize of superior skill. When any one

was declared a victor it was customary to erect a monument to his honour, and such seems to have been the origin of the building sometimes called the Lantern of Demosthenes, the term "Choragic" having a meaning in relation to stage performances, and the person who gave the entertainment being called the Choragus. This one, erected to the honour of Lysicrates, is almost the only one now remaining; it was built about 330 years before Christ, and is regarded as one of the most exquisite remains of Greek art. The monument is a very small structure. There is first a square basement or pedestal, about 12 feet high by 10 in width on each of its faces; above this are three circular steps, and on the uppermost of these steps is the monument, a circular building 7 feet in diameter by about 11 in height. This building is constructed in a very singular manner. It is formed of six pieces of marble, convex on one surface and concave on the other, and forming each one-sixth part of a cylinder. They are built up edge to edge so as to form a perfect cylinder; but at the vertical lines of junction are introduced Corinthian columns, one-half of the substance of which projects beyond the circular wall. These columns support an architrave, which is formed of one single block of marble cut into the form of a ring; above this is a frieze, also formed from one single piece of marble; then comes a cornice, and the whole is surmounted with a *tholos* or roof, made from one piece of marble, which rests on the circular wall. The exterior of this roof is somewhat conical in form, but the interior is made more nearly dome-shaped. The building has no entrance, nor is there any admission of light to the interior, the structure having been merely a monument, to be viewed externally. The basement of this monument is eminently bold and simple, admirably proportioned to the rest of the structure, and harmonising perfectly with it. The columnar ordinance is the only perfect specimen of the style in existence of pure Greek origin, and it has never been surpassed, perhaps not equalled in beauty elsewhere. The most exquisite harmony reigns throughout its composition; it is simple without being poor, and rich without being meretricious; and the same applies to the superimposed tripod and its supports. The decorations of the various parts of this building are very beautiful. The wall is nearly plain till near the top, where there is a row of sculptured tripods surrounding the building. The columns, in respect to the fluting of the shaft, the mouldings of the base and the foliage of the capitals, are considered quite a model of this kind of architecture. The frieze is sculptured with figures, representing a mythological story. The cornice of the entablature is decorated with ornaments. The exterior of the marble roof is sculptured to represent a thatch or covering of laurel leaves, and from the centre of it rises a small flower on which formerly stood a tripod.

The Costume and Weapons of the Phigaleian Frieze.

The dress of the Athenians, with whom the Amazons are engaged in combat, consists of a kind of cloak or robe, which covers the left shoulder, leaving the right bare; it is fastened round the waist by a belt, and reaches no lower than the knee. In many instances this robe is nearly disengaged from the body, being either simply secured round the neck by a fibula, or thrown loosely over the left arm. The offensive weapons of the Athenians appear to be swords, except in the particular case of Theseus, who, as the avowed imitator of Hercules, is properly represented fighting with a club, and bearing on his arm the skin of a lion instead of a shield. Their defensive armour consists of helmets and shields. The latter are large and circular, with a broad border round the circumference. They resemble in form the shield on which the names of the Ephebi of Athens are engraved. Of the helmets there are four kinds: one which fits the head closely, without either visor or crest; another, which differs from the former only in having a crest; a third, with a long pointed visor; and a fourth, of an oval form, with flaps descending on each side of the face, for the protection of the cheeks and ears. A remarkable diversity is apparent in the dresses of the Amazons. Sometimes they are represented in long tunics reaching to the ground, sometimes in a short vest reaching only to the knees; and in one of the bas-reliefs an equestrian Amazon has her arms covered with long sleeves, and her lower limbs clothed with a kind of trousers, all which dresses, as we know from the testimony of ancient authors, were in use among the Amazons. In some instances their heads are without any covering, while in others they are defended by a close helmet. One of these females has her hair fastened up by a knot at the top of her head. Their legs, with only one exception, are invariably protected by boots, which reach up nearly to the knees. Their robes are uniformly fastened round their waists by a zone, and they have often one or two belts passing over the shoulders and crossing in front between the breasts. It is to be regretted that none of the offensive arms with which the Amazons fought are here preserved; but we perfectly know that they assailed their enemies with swords and battle-axes in close combat, and that

they annoyed them at a distance with spears and bows and arrows. In the Phigaleian frieze they are represented as using the two former weapons only. The use of the sword is, indeed, clearly determined by the circumstance of a scabbard being fastened to the belt of one of the Amazons, and by the hilts which are left in the hands of some of the figures; and we may reasonably conclude, from the action of a few other figures, that they also fought with the battle-axe. But the almost total loss of the weapons used by the combatants in this frieze renders it extremely probable that they were for the most part executed in bronze, the holes into which they were inserted being still visible in many places. The Amazonian shields are rather larger than usual on these bas-reliefs; they are of an oval shape, and a semicircular piece has been cut out at the edge of the upper part, probably for the purpose of furnishing a loophole through which they might watch the motions of their enemy. These shields were called *pelta*, and from the semicircular piece cut out at the edge, they are frequently described as having the form of a half-moon. The Amazons are said to have been very skilful in the management of horses. They are here sometimes represented fighting on horseback, though more frequently on foot.

Early Renaissance.

Like the Rounded architecture, the Pointed was fated only to have its day. After it had throughout all Europe superseded that Rounded style with most extraordinary rapidity, it was itself again in its turn throughout all Europe rejected and displaced by an external and superficial return to those forms and principles of the ancient Greek and Roman style which had preceded both, and the change was equally rapid and universal. Architects, while the finest antique monuments yet subsisting stared them in the face and gave them constant ocular evidence of their superior beauty, had every day more widely deviated from those forms and principles, till at last their productions retained not the least similitude to those of the ancients, out of which they might be said to have grown. Just when they had arrived at the utmost pitch of their dissimilitude and when those splendid relics of antiquity that might, it should seem, have restrained or recalled them from their aberrations, had almost all disappeared from the surface of the earth, they were suddenly seen to leap backwards across all the intervening centuries of slow and gradual development of the Pointed and of the Rounded style that had preceded it in order to revive in name and pretension, if not in reality, in their new fabrics, the forms and features of those antique monuments destroyed. They again abandoned that complicated arch, that expanding buttress, which had become features so prominent in every edifice, for the simple coved ceiling, a transverse cincture and upright support; they again set aside every species of tracery and tabernacle work, of cusp, and canopy, and crocket and other ornaments peculiar to the Pointed style, for the capital, cornice, entablature, balustrade and vase of the ancients; they even abased all these deviations from the antique, which they had erst so much admired, and they called their proceeding a revival of ancient taste. The term "revival" can hardly with strict propriety be applied to such an event, since a revival can only take place in that identical body in which that peculiar mode of life existed before. The ancient Classical forms had existed in Greece, whereas the renewed form sprang up in Italy. However much the change might have displayed an unqualified abandonment of the Pointed style with all its peculiar merits as well as blemishes, it was only an external resumption of certain antique forms jumbled together without regard to their nature or destination, and by no means a uniform and universal and consistent return to the very essence of antique taste and principle.

German Churches.

The great impression which the German churches, particularly the interiors, make upon the mind of every unprejudiced person, on that of the intelligent and well-informed as well as that of the uncultivated and ignorant, is truly wonderful; they combine the simplicity and majesty of the groves of the forest with the richness and beauty of its flowers and leaves; all is variety, greatness and sublimity. The golden age of this style continued from the middle of the thirteenth to the latter end of the fourteenth century. The desire to produce something new and still more beautiful, as it had caused the decline of the ancient Roman, and afterwards, in the seventeenth century, that of the Italian style of architecture, occasioned likewise the decay of the German style of church building. To a severe regularity of forms succeeded arbitrary petty decorations, and whereas the best examples of the thirteenth century are ornamented with fruit and flowers, the edifices of the fifteenth were themselves in the form of plants, a freak which seems to overstep the bounds of architecture. This style of building, having outlived its prosperity, was the more easily superseded in the sixteenth century by a more modern Italian style.

NOTES AND COMMENTS.

If we may judge from the "Calendar of the Glasgow and West of Scotland Technical College," Glasgow, it is more fortunate than the rest of Great Britain in its facilities for technical training. A student who is eager to gain knowledge will find there is as much of all kinds available for him within the city as the most ambitious can desire. This mainly arises from the excellent spirit in which education is controlled in Scotland. Classes in the Glasgow University can be entered without difficulty by an operative or an apprentice, and he will there become acquainted with all that science can teach about his calling. The English universities and higher colleges occasionally condescend to do something of the kind, but in a perfunctory sort of way. It is only, as it were, the superfluous scraps which are bestowed. This example is imitated in so-called technical colleges, and, as in the very big and very desolate one belonging to the City and Guilds at South Kensington, there is welcome only for those who are known to be wealthy. The sons of manufacturers are taught by means of funds that were supplied by benevolent people, in the expectation that they were to be employed for the benefit of students who could not obtain technical education without that sort of help. The technical college of Glasgow is made up of a series of institutions in which classes are so arranged that the skill of an immense number of able professors can be utilised by a student on most economical terms. A boy of ten will find the way has been prepared for him and he can follow it constantly or occasionally as most convenient to himself, until he becomes a Doctor of Science. Those who are compelled to make only short journeys will find everything made easy for them. Students of mechanical engineering, naval architecture, electrical engineering, architecture, building construction, mining, metallurgy, agriculture, art industries, chemical industries, textile industries, or commerce, who have only evening hours at their disposal, can satisfy themselves that a systematic education awaits them, with the use of laboratories, workshops and appliances. During the last session we see that 72 architects and measurers, 276 plumbers, 78 painters, 91 joiners, 24 masons and bricklayers, 88 chemists, 100 electrical engineers, 8 blacksmiths, 11 iron-moulders and representatives of an immense number of other industries attended the evening classes. The numbers under instruction given in the day is also most remarkable. The advantage of the system is shown by the list of appointments held by former students of the college, for usefulness in business should be the aim of technical training. The result shows that Glasgow flourishes in education as well as in many other affairs.

ABOUT 500 workmen are now engaged on [the great dome of the new Basilica at Montmartre. As is generally the case, the exterior and interior parts will not correspond in contour. The inner dome will be about 165 feet from the pavement of the church; the outer will be 276 feet. A staircase will be constructed in the intervening space. The great dome will probably be finished before the end of next year. The four smaller domes will then be undertaken. The campanile, which will be over 400 feet in height, will not be completed until the year following. The group of buildings will then dominate Paris and the surrounding district. The fifteen side-chapels are now ready to be employed for service. The crypt, with its seven chapels, may also be considered as completed. The interior decoration will soon have to be considered, and owing to the severe character of the building it will be a problem not easily solved. The expenditure on the basilica has been enormous, and yet at no time was money wanting. The French are generally not liberal in paying for church building, but in 1873 the funds for the Montmartre church amounted to 600,000 francs, and in twenty-one years the subscriptions came in so liberally that up to the end of last July the total receipts reached 27,594,713 francs, and there is no sign of cessation.

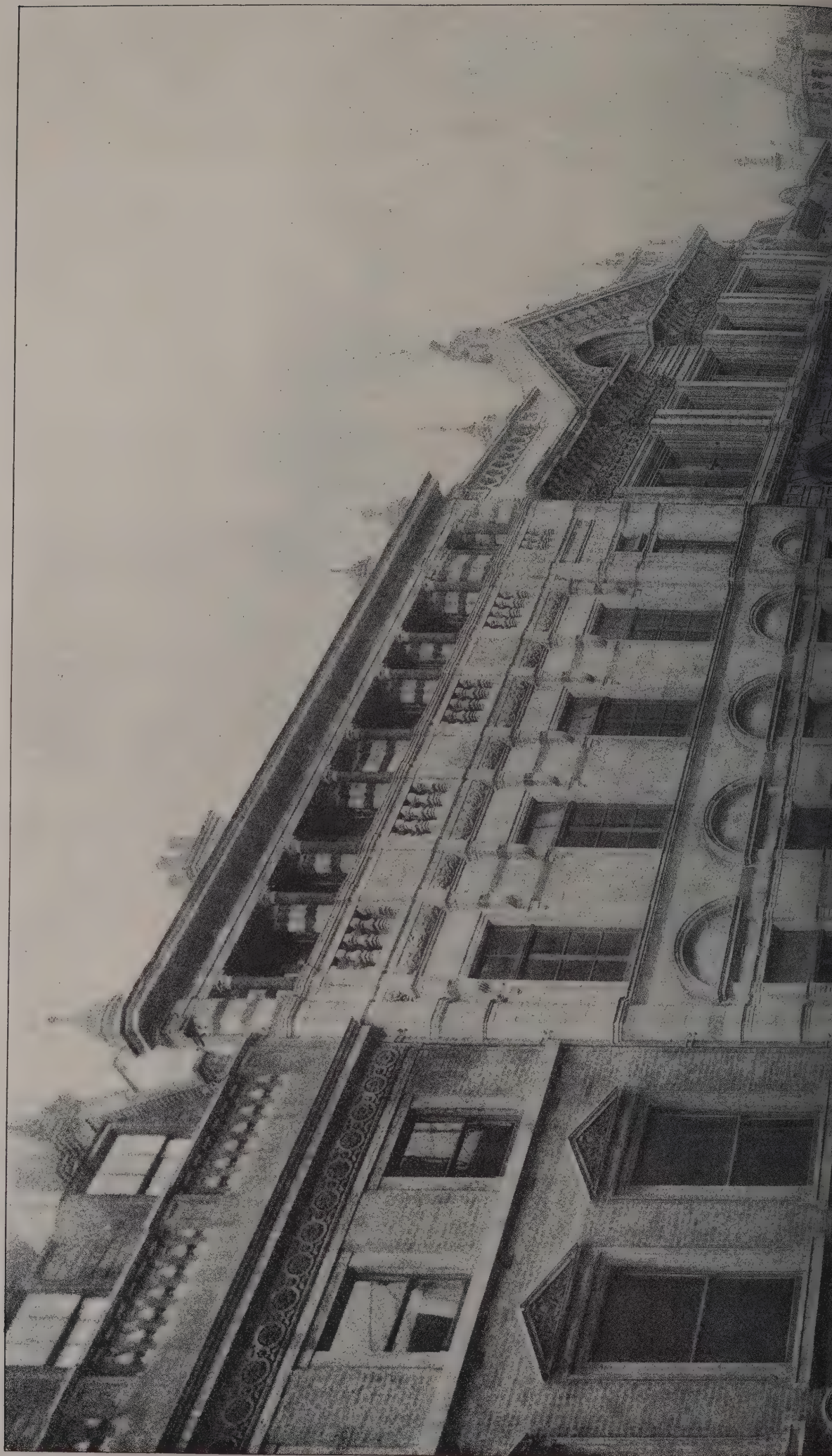
AMONG the archaeological explorers of the century there is not one who merited more honours than the late JEAN BAPTISTE DE ROSSI, who has died on the 20th inst. in the

papal palace of Castel Gandolfo. He attained his seventy-second year. In an age like ours the Catacombs, which he admired beyond all things in that Subterranean Rome of which he wrote, are not esteemed like the ancient city at Hissarlik or the tombs beneath the Egyptian sands. But it was Rossi who was the pioneer in Rome in that sort of exploration by which ancient life becomes reanimated, and which has been so successful in many other places. The Museum of Christian Antiquities, which he organised in the Lateran, is one of the most remarkable in the world, if judged by its value as historical evidence. Every modern explorer of the Catacombs has endeavoured to obtain Rossi's authority as a support of his conclusions. Before the "Roma Sotterranea" had established Rossi's fame he was known among foreign archaeologists for his essays on inscriptions, mosaics, &c., and he wrote also on the family of artists known as the COSMATI, LEON BAPTISTA ALBERTI and others. He retained his office as Conservator in the Lateran, and many of our readers will be able to recall his genial eloquence whenever he was consulted about any of his beloved antiques.

THE origin of photography is a disputed question. A paper describing DAGUERRE'S invention, read before the French Academy of Science in January 1839, was long supposed to be the earliest historical record of the process. Afterwards claims were set up on behalf of JOSIAH WEDGWOOD, the potter, and others. In Vienna there is a society which takes great interest in the question. Herr EDER, one of the directors, considers that the earliest operator was a German physician, JOHANN HEINRICH SCHULZE, who was born on May 12, 1687, and was afterwards Professor of Medicine in Halle. In 1727 he was making experiments in which phosphorus, chalk, aquafortis and silver were employed, and on bringing some of the substance to which they were applied for examination to a window, he perceived that parts became sensibly darkened, and on continuing the experiments discovered the sensitiveness to light as a property of salts of silver. He was also able to utilise his discovery in copying manuscripts. It appears there is an early account of the process, which has not received much attention.

A CLIQUE may year after year prevent M. BENJAMIN CONSTANT from obtaining that Médaille d'Honneur which his paintings have won in the Salon. But his countrymen do not less esteem him on that account. They are sure, therefore, to give attention to his proposal concerning the old Roman theatre at Orange. There is nothing M. BENJAMIN CONSTANT loves better to paint than the occupants of a Byzantine or other ancient throne, with the fiercest light upon them, which will make their diadems, jewels and robes, and all the splendour around them appear in full brilliancy. But nobody can be more appreciative of old COROT when he said, "As soon as the dawn gives place to the day I shut up my paint-box and depart, for the mystery which is everything has disappeared and there is nothing more for me to paint." M. BENJAMIN CONSTANT desires that the words should be accepted as a principle by the director of the Comédie Française whenever he undertakes a performance of the ancient drama on the Orange stage. He would desire to see the theatre restored to its pristine magnificence, with its porphyry columns and statues of bronze, but that day is far off. But meanwhile he considers a glorious effect could be gained if the ruined theatre could be only dimly and mysteriously lighted. At the present time, when colour-effects by arrangement of lamps are so easily produced with the aid of electricity, the attempt would involve little trouble. In that way there would be a contrast offered which would make the revivals become unlike those of ordinary theatres, and the actors would attain a shadowy appearance that would be adapted to the occasion. Instead of ordinary men and women it would be easy for the spectators to imagine that the epic characters of the ancient dramatists were before them, once more compelled by Destiny to suffer in order that Justice might be asserted. To experience the emotions which would then arise would repay the longest journey, the most toilsome journey to Orange.

The Architect, Sept. 28th 1894.



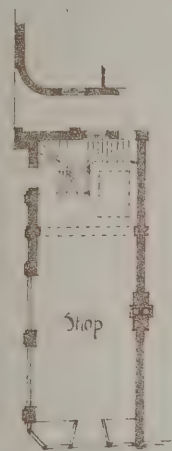


PHOTOGRAPHED BY BEDFORD LEMERE & CO

INTER-PROV. SYNDICATE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

P. & O. COMPANY'S NEW OFFICES, LEADENHALL STREET, LONDON, E.C.
T. E. COLLCUTT, Architect.





Ground Floor Plan.

Seven Perspectives of the
MIDDLETON HALL ESTATE
ISLINGTON, N.
H. Huxley-Gordon, Archt.







ILLUSTRATIONS.

P. & O. COMPANY'S NEW OFFICES, LEADENHALL STREET, LONDON, E.C.

THIS illustration shows the building without however the sculptured panels, which enhance the effect.

HILL WOOTTON, WARWICKSHIRE.

THIS little Warwickshire house and stabling cost only some 1,500*l.*, including boundary walls—the house itself only 1,000*l.* The principal rooms have been treated with painted panelling, and the house throughout has been treated with the utmost care. A view from the stable yard was exhibited in this year's Royal Academy. Mr. P. MORLEY HORDER is the architect.

NEW MUSIC-ROOM, 140 HARLEY STREET.

THIS is an illustration of a cleverly-treated music-room, intended to be an adjunct to an old house in Harley Street, W., approached from the first half landing of the main staircase and through a small winter garden. The walls to be lined with polished wainscot panelling, slightly fumigated. The drawing has been lent to us by the architect, Mr. H. HUNTLY-GORDON, A.R.I.B.A., 123 Cannon Street.

NEW PREMISES ON THE MYDDELTON HALL ESTATE, ISLINGTON, N.

WE publish to-day the illustration of a building which has been erected at the corner of Upper Street and Almeida Street, Islington. It forms the corner feature of a large block of premises, recently erected by Mr. H. HUNTLY-GORDON, of 123 Cannon Street, for Mr. HARRY LAWRENCE.

The site was formerly occupied by the house of Sir HUGH MYDDELTON, the founder of the New River Water Company, but it has now been divided into two portions, shop premises having been built on the portion fronting Upper Street and public assembly rooms and a concert hall have been built at the rear, with entrances and exits in Almeida Street. The plans of the front portion have been arranged so that the upper portion can be let separately.

The façades are built entirely of pinky-red terra-cotta made by Mr. J. C. EDWARDS, of Ruabon, and the joinery is of walnut. The modelling of the terra-cotta was executed by Mr. GILBERT SEALE.

The contractors for the foundations and work up to the pavement-level were Messrs. PATMAN & FOTHERINGHAM, but the superstructure and internal fittings and finishings were carried out by Messrs. F. & H. F. HIGGS, of Loughborough Junction.

ENGLISH CHANTRIES.

IN the most interesting volume on "St. Paul's Cathedral and Old City Life," by Dr. W. Sparrow Simpson, the sub-dean, there is a chapter on the chantry priests, based on statutes compiled by Dean Colet. It appears the Cathedral was "unusually rich in obits and in chantries." A list which exists and which is supposed to have been prepared in the fourteenth century, mentions seventy-three chantries. In the first year of Edward VI. there were thirty-six chantries, if groups are reckoned as one, or fifty-three if each be separately counted. Princes and persons of great wealth, when they founded monasteries, included amongst the duties of the religious for whose use they gave them, that they should for ever make mention of the donors in their daily services. When the taste for founding monasteries declined, which may be referred to about the close of the twelfth century, the disposition to secure the same object, by the foundation of chantries, began to prevail extensively in the better classes of society, and it continued with unabated zeal to the very eve of the Reformation.

A chantry did not necessarily require that any edifice should be erected for it. Chantries were usually founded in churches already existing, sometimes the churches of the monasteries, sometimes the great cathedral or conventual churches, but very frequently the common parish church, whether in a town or in a rural district. All that was wanted was an altar with a little area before it and a few appendages, and places were easily found in churches of even small dimensions in which such an

altar could be raised without interfering inconveniently with the more public and general purposes for which the churches were erected. An attentive observation of the fabric of the parish churches of England will often detect where these chantries have been, in some small remains perhaps of the altar, which was removed at the Reformation, but more frequently in one of the niches which were in proximity with the altars. Sometimes there are remains of painted-glass, which it is easy to see has once been the ornament of one of these private foundations, and more frequently one of those arched recesses in the wall which are called founders' tombs, and which in many instances no doubt were actually the tombs of many persons to whose memory chantries had been instituted.

In churches which consisted of only nave and chancel with side aisles, the eastern extremities of the north and south aisles were often seized upon for the purpose of these foundations; in the larger churches, having the platform resembling the cross on which the Saviour suffered, the transverse beams were generally devoted to the purpose of these private foundations. In the great conventual churches of monasteries, it would appear as if provision were often made for these private chantries in the original construction, each window that looks eastward being often made to light a small apartment just sufficient to contain an altar and a little space for the officiating priest.

It was by no means unusual to have four, five, or six different chantries in a common parish church. When the fabric of a church afforded of itself no more space for the introduction of chantries, it was usual for the founders to attach little chapels to the edifice. It is these chantry chapels, the use and occasion of which are now so generally forgotten, which occasion so much of the irregularity of design which is apparent in the parish churches of England. Erected also as they generally were in the style of architecture which prevailed at the time, and not in accommodation to the style in which the original fabric was built, they are a principal cause of that want of congruity which is perceived in the architecture of different parts of the parish churches.

When chapels were erected for the especial purpose of the chantries, they were usually also the places of interment of the founder and his family, whence we sometimes find such chapels belonging, even to this day, to particular families, and adorned with monuments of many generations. One of the most beautiful chapels of this kind is in the little village of Sandal, a few miles from Doncaster, the foundation of Rokeby, archbishop of Dublin, who died in 1521. The church of Sandal being small afforded no scope for the design of this magnificent prelate. Having therefore determined that here should be the place of his interment and the perpetual celebrations in his memory, he erected a chapel on the north side of the choir, open, however, to the church on one side, being separated from it only by open wainscot. On entering it by the door one sees at once the whole economy of one of these chapels. Under the window looking eastward an altar has stood; the piscina on the right remains. On each side of the east window is a niche where once, no doubt, stood an effigy of a saint whom the archbishop held in peculiar honour. In the centre is a brass indicating the spot in which the body of the prelate lies; and in the north wall is a memorial of him, having his arms and effigies, with an inscription setting forth his name and rank and the day of his decease, with divers holy ejaculations. The stone and woodwork have been wrought with exquisite care, and the windows appear to have been all of painted-glass.

Sometimes chantries were established in edifices remote from any church, a chapel being erected for the express purpose.

In chantries of royal foundation, or in chantries founded by the more eminent prelates or barons, the service was conducted sometimes by more than one person. But usually there was but one officiating priest. The foundation deeds generally contain a distinct specification of his duties, which consisted for the most part in the repetition of certain masses, but sometimes the instruction of youth and the delivering pious discourses to the people made part of the duty of the chantry priests. They also contain an account of the land settled by the founder for the support of the priest. The names of the persons whom he was especially to name in his services are set forth, as well as the mode of his appointment and the circumstances in which he might be removed. Generally the king was named together with the founder and members of his family. This, it was supposed, gave an additional chance of the foundation being perpetuated. The king's license was generally obtained for the foundation.

In many towns and country places there are ancient houses known by the name of chantry houses, or sometimes chantries or colleges. These have been places of residence of the chantry priests, and were called colleges, a considerable number of them being in one church, where they lived a kind of collegiate life, it being held that the clergy should mix but little with the laity. These, as well as all other property given for the support of the chantry priests, were seized by the Crown.

and sold to private persons, when by an Act passed in the first year of King Edward VI., c. 14, all foundations of this kind were absolutely suppressed and their revenues given to the king.

VALUATION OF LANDED AND HOUSE PROPERTY.

THE following evidence was given by Mr. Robert Vigers before the select committee of the House of Lords on Town Improvements (Betterment), and explains the method usually adopted by skilled experts for arriving at the value of property in this country :—

Lord Thring.

All valuation of land, I presume, is a very difficult business, is it not?—Well, it requires great practice; a man cannot do it unless he is constantly at it.

In very many cases it is a matter of guesswork to a great extent, is it not?—I should imagine a great deal of it is guesswork when we find of late years barristers have taken to valuing land for clearing sites for workmen's dwellings; I should think there must be a great deal of guesswork about that.

I am not asking about such cases as that, but with a man as expert as yourself, do you not often have to guess at the value?—I do not think so. I judge from general experience.

Then you, as an expert, have no great difficulty in valuing any property?—Yes, we have great difficulty in valuing at times.

But you do it?—Yes, we do it. In making a valuation simply for a man to purchase or sell property, I should guard myself, and say, That is the value to the best of my opinion, but it may be worth more, or it may be worth less.

Still, like all human affairs, I presume your client acts upon your judgment, and sells his house at a greater or less price, according as you tell him it is more or less valuable?—At times, yes; but mostly you find that a man asks you your opinion, and then acts upon his own judgment.

Marquis of Salisbury.

His judgment, whatever it is, is controlled by the judgment of the other party to the transaction, if there is anything unreasonable in it?—Yes.

Which is not the case in an arbitration?—Certainly not.

Lord Farrer.

You have spoken as if the future were an extremely difficult element to take into consideration in fixing the value of land?—Yes.

You are guided generally by the price that is actually given?—Yes, by the times' price.

In fact, there is no such thing as a scientific basis of valuation, except experience?—Not that I know of.

What the property is ordinarily sold for?—Yes, what it might be fairly worth.

I want to ask you this. In putting a value upon land for a person who is going to sell to the London County Council, are you guided solely by what the land or houses in that street or place have been sold for, or are you guided by what they are likely to be sold for. Is it the future value or the past value that you have regard to?—The present value.

What is the present value founded upon?—It depends upon what the object is. If you are valuing a property that has only a ground-rent, we will say, and a reversionary value, you value the ground-rent upon the 3 or 4 or 5 per cent. tables, as it may be, for the term of the lease to run. Then you have got something beyond that in the reversion. The only way to arrive at the value of the reversion is to take the present rental value of the property and defer that for the number of years that the lease has to run. It is impossible for you to tell what the value of the property is going to be at the end of the lease that has got to run. The man who carries out that practice, as we are taught, always bases the value of a reversion upon the value of to-day.

Are there not properties which are increasing in value, and are there not properties which are diminishing in value?—Yes.

Do you value both upon the mere present rental?—It is impossible to say whether property twenty years hence is going to be of less or greater value, and a man is satisfied to buy it upon the present day's value.

Is that the way in which in ordinary purchases or sales of things producing a value their value is calculated?—According to my experience, yes.

Always upon the present rental?—Upon the present value; not the present rental always, but the present value.

Upon what is that present value founded? In selling or purchasing any investment you like to take, is not the value founded upon what you expect the thing to produce?—Upon what it is producing to-day.

Is that all?—That is all. One cannot tell what it will produce twenty or thirty or forty years hence.

Do you assume in all these cases that the same property will produce exactly the same thing twenty or forty years hence that it will produce to-day?—I know of no other way of valuing property.

Is that the way you value all property, for instance, investments?—Yes.

Lord Thring.

If I ask you to value a house in the country and I show you that a beautiful view is going to be opened up by a particular improvement that is going to be made, do you mean to tell me you would not take that improvement into consideration in valuing the house?—If you were to tell me it was going to be made I should consider that.

Is not that a future thing?—I do not know about that; I think it is present.

That is practically what Lord Farrer was putting to you.—If you were to tell me that possibly twenty or thirty years hence a beautiful view may be opened I could not tell.

Neither Lord Farrer nor myself asked you about twenty years hence. What we ask is this: when you are valuing a house in town or in the country, or when you are valuing land anywhere, and sufficient evidence to reasonably satisfy a man of common sense is given that some event or contingency has occurred which will make that land more valuable, would you value it having regard to that contingency or event?—I value it at what it is worth that day. That is exactly what I tell you.

I ask you whether, supposing there is sufficient evidence to satisfy a reasonable man that there will be an improvement made in the surroundings of that house or in the use of the land, or anything else you like, by some immediate probable event, you do not take that immediate probable event into your consideration in valuing the then present value?—I say yes; I take it and base it upon its rental value to-day, and if you tell me the improvement is made to-day and absolutely existing, I can see what that improvement is worth. It may be worth something or it may be worth nothing. If it is worth something I should add it in.

You have to add it to the present rental value?—That is what I am saying. It is the present rental to-day you base your reversionary value upon.

Then it is only a quibble about words if you like to call that the "present rental value." I thought what you meant by "present rental value" was the present rent?—No. I am sorry your lordship should think I am quibbling about words; I am not in the habit of doing so.

What is the difference between "present rental value" and the present rent?—The difference is very great.

Will you explain what it is?—The "present rent" is what the property is at present let at, the "present rental value" is the value it may be worth.

Earl Cowper.

Have you had to value a great many properties which were improving, and in which you had to look forward to the future as an element in the valuation?—I have had to value properties of all classes.

Very often, and indeed generally, there are two valuers, one for the purchaser and one for the seller, and an arbitrator is called in; that is very often the case, is it not?—Yes.

In the case of improving properties in which the price has to be settled with a view to what would be the value in a certain number of years, is there much difference between the values as fixed by the valuer for the purchaser and the valuer for the seller, and is the whole thing more uncertain than when you are merely valuing property that is stationary?—I find that difference in valuation depends upon the men you meet more than anything else. Some men have very inflated ideas of what property is going to be worth, and that is where you come into difficulties in making settlements.

It depends upon the specific valuer whether he takes a hopeful view of the future or the contrary?—Yes, certainly; there is a very great difference sometimes.

In valuing for the future there is much more discrepancy between the judgments of different men than when you are valuing property where no changes are anticipated?—Yes, I should think so.

It is a very uncertain thing valuing for the future?—Yes, very uncertain; especially with some men whom one has to meet.

Lord Belper.

I wish to ask you one question with regard to the figures you gave us. I understood those figures were based upon the present rateable values compared with the rateable values a certain number of years ago?—Yes.

I think you added that in your opinion the authorities who made those assessments were neither very active nor very accurate?—In many parishes I should say that is so.

Therefore the value of those figures is so far discounted by their want of accuracy?—Yes; I mentioned it simply because I think that either those figures I have given you or those given

by Mr. Dickinson should be relied upon very little as a guide as to what improvement had taken place.

You do not give them us for the purpose of relying upon them in judging whether the values of the properties had actually increased or not, but as showing that there might be considerable difference in regard to whether they had increased or not?—Yes.

I wish to ask upon what general principles you would go when you are valuing property for rating purposes; would the principle you spoke of as applicable to purchase and sale apply to rating purposes also, as a general rule?—For rating purposes we have to fix the price that it is reasonable to suppose a tenant would pay for the occupation of the premises from year to year.

WALL-THICKNESS UNDER THE BUILDING ACT, 1894.

APPENDED to the new London Building Act are the usual schedules about the construction of walls. We have tabulated the prescriptions in Parts I. and II. about the thickness of external and party walls, for the sake of convenience when they are employed:—

Parts I. and II. of this schedule apply to walls built of bricks not of less than $8\frac{1}{2}$ inches long, or of stone or other blocks of hard and incombustible substance, the beds or courses being horizontal.

1. Every building unless otherwise sanctioned in accordance with this Act shall be enclosed with walls constructed of brick, stone, or other hard and incombustible substances, and the footings shall rest on the solid ground or upon concrete or upon other solid substructure. Provided that open sheds not exceeding 16 feet in height and not exceeding four squares in area may be constructed of any substances and in any manner approved by the district surveyor.

2. Every wall constructed of brick, stone, or other similar substances, shall be properly bonded and solidly put together with mortar or cement, and no part of such wall shall overhang any part underneath it except to the extent of 6 inches, and provided that the projection be well and solidly corbelled out and that the side of the wall opposite to the corbelling be carried up vertically in continuation of the inner face thereof. And all return walls shall be properly bonded together.

3. The thickness of every wall not being built of bricks or stone or other hard and incombustible substances laid in horizontal beds or courses shall be one-third greater than the thickness prescribed in Parts I. and II. of this schedule.

4. The thickness of any wall of a dwelling-house if built of materials other than those before specified shall be deemed to be sufficient if made of the thickness required by Parts I. and II. of this schedule, or of such thickness as may be approved by the Council.

5. When hollow walls are constructed there shall be a wall on one side of the hollow space of the full thickness prescribed by this Act.

6. The height of storeys shall be measured as follows:—
(a) The height of a topmost storey shall be measured from the level of the underside of its floor joists up to the level of the under surface of the tie of the roof or other covering, or if there is no tie, then up to the level of half the vertical height of the rafters or other support of the roof; (b) the height of every storey other than a topmost storey shall be measured from the level of the underside of the floor joists of the storey up to the level of the underside of the floor joists of the storey next above it.

7. For the purpose of determining the thickness of a wall the height of such wall shall be measured from the base of the wall to the top of the topmost storey whether such wall is carried to the full height or not, or in case of a gable when there are no storeys in the roof to half the height of the gable.

8. Walls are deemed to be divided into distinct lengths by return walls and the length of every wall is measured from the centre of one return wall to the centre of another, provided that such return walls are external party or cross walls of the thickness required under this schedule and bonded into the walls so deemed to be divided.

9. Unless with the consent of the Council every wall other than a wall carried on a bressummer shall have footings.

The projection of the bottom of the footing of every wall on each side of the wall shall be at least equal to one-half of the wall at its base unless an adjoining wall interferes, in which case the projection may be omitted where that wall adjoins, and the diminution of the footing of every wall shall be formed in regular offsets, and the height from the bottom of such footing to the base of the wall shall be at the least equal to two-thirds of the thickness of the wall at its base.

10. The underpinning of walls and chimneys shall be built with brick or stone bedded in cement to the full thickness of the old wall or work, and with proper footings, or to an additional thickness if the increased height of the wall so re-

quires, and shall rest on solid ground or on concrete or on other solid substructure as a foundation, and the whole shall be executed to the satisfaction of the district surveyor.

11. A wall shall not be thickened except after notice served on the district surveyor of the intention to thicken, and the thickening shall be executed with brick or stone-work in cement properly bonded to the old work, to the satisfaction of the district surveyor.

THICKNESS OF EXTERNAL AND PARTY WALLS.

Part I.—Building not Public and not of the Warehouse Class.

Height, not exceeding	Length of Walls.			
	Not exceeding 30 feet.	Not exceeding 35 feet.	Not exceeding 45 feet.	Exceeding 45 feet.
25 feet	$8\frac{1}{2}$ in. throughout (if not more than two storeys) Exceeding 30 feet, $8\frac{1}{2}$ in. rest of height 13 in. below top-most storey	—	—	—
40 feet	—	$8\frac{1}{2}$ in. rest of height 13 in. below top-most storey Exceeding 35 feet, $8\frac{1}{2}$ in. rest of height 13 in. below top-most storey 17½ in. one storey	—	—
50 feet	Not exceeding 30 feet. $8\frac{1}{2}$ in. rest of height 13 in. below top-most storey 17½ in. one storey	—	13 in. rest of height 17½ in. two storeys	13 in. rest of height 17½ in. one storey 21½ in. one storey
60 feet	—	—	13 in. rest of height 17½ in. two storeys	13 in. rest of height 17½ in. two storeys 21½ in. one storey
70 feet	—	—	13 in. rest of height 17½ in. two storeys 21½ in. one storey	To be increased in each storey below uppermost two storeys by 4½ in.
80 feet	—	—	13 in. rest of height 17½ in. three storeys 21½ in. one storey	Ditto
90 feet	—	—	13 in. rest of height 17½ in. three storeys 21½ in. one storey 26 in. one storey	Ditto
100 feet	—	—	13 in. rest of height 17½ in. three storeys 21½ in. two storeys 26 in. one storey	Ditto
120 feet	—	—	13 in. rest of height 17½ in. three storeys 21½ in. two storeys 26 in. two storeys 30 in. one storey	Ditto

If any storey exceeds in height sixteen times the thickness prescribed under this schedule for walls of such storey, the thickness of each external and party wall throughout such storey shall be increased to one-sixteenth part of the height of the storey, and the thickness of each external and party wall below that storey shall be increased to a like extent, but any such additional thickness may be confined to piers properly distributed, of which the collective widths amount to one-fourth part of the length of the wall.

No storey enclosed with walls less than 13 inches in thickness shall be more than 10 feet in height between the floor and the ceiling thereof or between the floor and the tie of the roof.

All buildings excepting public buildings and such buildings as are in this Act defined to be buildings of the warehouse class shall, as respects the thickness of their walls, be subject to the provisions contained in this part of this schedule :—

Part II.—Buildings of the Warehouse Class.

Height, not exceeding	Thickness at Base.			Exceeding 45 feet.
	Not exceeding 30 feet.	Not exceeding 35 feet.	Not exceeding 45 feet.	
25 feet	13 in. (unlimited).	—	—	—
30 feet	—	—	13 in.	17½ in.
40 feet	—	13 in.	17½ in.	21 in.
50 feet	17½ in.	—	21½ in.	26 in.
60 feet	—	—	21½ in.	26 in.
70 feet	—	—	21½ in.	Increased in thickness from base to within 16 feet from top by 4½ ins.
80 feet	—	—	21½ in.	Ditto
90 feet	—	—	26 in.	Ditto
100 feet	—	—	25 in.	Ditto
120 feet	—	—	31 in.	Ditto

The thickness of the wall at the top and for 16 feet below the top shall be 13½ inches, and the intermediate parts of the wall between the base and 16 feet below the top shall not be of less thickness than would be the case if the wall were to be built solid throughout the space between straight lines drawn on each side of the wall, and joining the thickness at the base to the thickness at 16 feet below the top.

Nevertheless, in walls not exceeding 30 feet in height the walls of the topmost storey may be 9 inches thick provided the height of that storey does not exceed 10 feet.

If in any storey of a building of the warehouse class the thickness of the wall as determined by the provisions of this schedule is less than one-fourteenth part of the height of such storey, the thickness of the wall shall be increased to one-fourteenth part of the height of the storey, and the thickness of each external and party wall below that storey shall be increased to a like extent, but any such additional thickness may be confined to piers properly distributed of which the collective widths amount to one-fourth part of the length of the wall.

The thickness of any wall of a building of the warehouse class, if built of materials other than those before specified, shall be deemed to be sufficient if made of the thickness required by the provisions of this schedule, or of such other thickness as may be approved by the Council.

Miscellaneous.

The thickness of a cross wall shall be two-thirds of the thickness hereinbefore required for an external or party wall of the same dimensions and belonging to the same class of buildings, but never less than 8½ inches, and no wall subdividing any building shall be deemed to be a cross wall unless it is carried up to the floor of the topmost storey, and unless in each storey the aggregate extent of the vertical faces or elevations of all the recesses, and that of all the openings therein taken together, does not exceed one-half of the vertical face or elevation of the wall.

Wherever a cross wall becomes in any part an external wall, such cross wall shall be of the thickness required for an external wall of the same height and length and belonging to the same class of buildings.

Where an increase of thickness is by any rule of Part I. or Part II. of this schedule required in case of a wall exceeding 60 feet in height and 45 feet in length, or in case of a storey exceeding in height sixteen times or fourteen times (as the case may be) the thickness prescribed for its walls, or in case of a wall below such storey, the increased thickness may be confined to piers properly distributed, of which the collective widths amount to one-fourth part the length of the wall.

Fire-resisting Materials.

The following materials are for the purposes of the London Building Act deemed to be fire-resisting materials :—

(1) Brickwork constructed of good bricks, well burnt, hard

and sound, properly bonded and solidly put together (a) with good mortar compounded of good lime and sharp, clean sand, hard clean broken brick, broken flint grit or slag, or (b) with good cement, or (c) with cement mixed with sharp, clean sand, hard clean broken brick, broken flint grit or slag; (2) granite and other stone suitable for building purposes by reason of its solidity and durability; (3) iron, steel and copper; (4) oak and teak and other hard timber when used for beams or posts or in combination with iron, the timber and the iron, if any, being protected by plastering in cement or other incombustible or non-conducting external coating. In the case of doors, oak or teak or other hard timber not less than 2 inches thick. In the case of staircases, oak or teak or other hard timber, with treads, strings and risers not less than 2 inches thick; (5) slate tiles, brick and terra-cotta when used for coverings or corbels; (6) flagstones when used for floors over arches, but not exposed on the underside and not supported at the ends only; (7) concrete composed of broken brick, stone chippings or ballast, and lime cement or calcined gypsum when used for filling in between joists of floors; (8) any material from time to time approved by the Council as fire-resisting.

POMPEII.

THE Naples correspondent of the *Daily News* in a recent letter asks how many people, when they visit Pompeii, remember anything of what has been learnt out of its early history? To know something of it adds so much to the interest with which the dead city is contemplated that every one must feel grateful to Professor Man for having prefaced his most admirable "Führer durch Pompeii," quite lately published under the auspices of the German Archæological Institute in Rome, with a readable brief introduction. As the guide is not to be published in England until two or three years are passed, I will here give a sketch of what Professor Man, the greatest living authority on Pompeii, tells us about its history.

The city of Pompeii already existed in the sixth century B.C., as is proved by the remains of its oldest public building, the Doric Temple. But the date of the first foundation of the city is quite unknown. It was first inhabited by the Oscans, a race whose language is imperfectly known through some inscriptions. The name of Pompeii is derived from a word belonging to this ancient language, the word "pompe," or "five." The city was wrested from its original inhabitants by the Samnites when they advanced from the mountains to the coast in about the year 420 B.C. The Oscans and Samnites together, under the influence of the neighbouring Greek colonies, developed a civilisation probably far outstripping that of the contemporary Romans. In the years 342 B.C. and 290 B.C. the Samnite wars led to the subjection of Pompeii by Rome. The city was drawn into the Roman confederacy, during which it preserved its independence as to its home affairs. It was only in the year 80 B.C., when the Samnites were conquered by Rome, that Pompeii became Romanised by a colony of veterans under P. Sulla, a nephew of the then Dictator. The city was presently named Colonia Cornelia Veneria Pompeianorum, after the family name of the Dictator Sulla and the goddess of whom he was a special devotee, and who then became, as the Venus Pompeiana, the tutelary divinity of the city. At the same time a suburb was founded, probably by the citizens who had been driven out in favour of the Roman veterans, which was named Pagus Felix, after the by-name of the Dictator, and later, in honour of Augustus, Pagus Augustus Felix. The inscriptions which have been found at Pompeii show that many state offices existed in pre-Roman times. There was a Kombennion, National Assembly or Senate, it is not known which; a Medix or Medix Tutix, the chief of the city; a Koaisstur, or Quæstor, who was probably entrusted with the city treasury; and two aediles, ædiles, employed in the making of roads. Under the Romans, after 80 B.C., there were the usual decuriones, ædiles and other public officers, also many priests, priestesses, ministers and magistrates. Pompeii was built on the point of an ancient stream of lava, running towards the sea, close to the then full-flowing river Sarno. The city was the natural south-eastern port of the plain through which the river flowed. The sea was then not more than 1,500 feet distant from the city, the river serving as a harbour. On the banks of the river stood a small suburb of the city. From the busy port were exported not only the produce of the country in the interior but also the products of the plain itself, namely, wine and vegetables. The lava was cut into millstones, which formed a large article of export in the second century B.C.; but later on this source of profit ceased to be cultivated, and millstones were even imported into Pompeii from abroad. The harbour town grew more and more wealthy, from the fact that the Roman aristocracy, attracted by its beautiful situation and fine climate, began to settle in the environs. The inhabitants of Pompeii at that time numbered probably 30,000.

It will be remembered that the volcanic mountain, on the slopes of which Pompeii stood, re-awoke after ages of inactivity

in the year 63 A.D., when many buildings in the city were damaged or destroyed. Traces of the earthquake that happened then are still to be seen in the excavated city. Then in 79 A.D. came the awful eruption which, while the people were still repairing the damage done in 63, buried the city to a depth of more than 6 feet in small pumice-stones, and some time later with a rain of ashes to a similar depth. Those pumice-stones and ashes were not red-hot, as is generally believed, as the wood which has been found seemingly carbonised has only been thus changed by chemical processes. Traces of real burning on the mural paintings are very easily distinguished from the red tint which, in some unexplained way, overspreads a great portion of the wall-paintings when these have come in contact with the ashes. The manner in which Herculaneum was buried was very different, for there the pumice and ashes do not lie in regular strata as in Pompeii, but are mixed together in a sort of muddy paste, which, hardened into stone during the course of time, makes excavation difficult. After the catastrophe the upper storeys of the houses in Pompeii protruded above the ashes, showing where the city lay. Digging on a large scale then took place, and building material and valuable objects were carried away. All the marble, except a very few fragments, were removed in ancient times. Later on the remaining upper storeys of the houses were destroyed by time, as very little of them has been found. In 73 A.D. most of the inhabitants escaped. It has been calculated that only 2,000 of the 30,000 were killed on the spot, but how far the fugitives were able to run is not known; the fact is that many of them were overtaken and buried by the falling ashes at a place on the banks of the Sarno not far from the city, for in 1880 and 1881 many skeletons, together with many valuable objects now kept in the Naples Museum, were found there.

Though the existence of Pompeii under the fields that then covered it was discovered as early as 1594, the city has only been regularly excavated since 1748, and till the year 1825 only the public buildings round the Forum, the Theatre, the Street of Tombs had been laid open to the view. The present reasonable and scientific mode of excavation was begun by Professor Fiorelli in 1881, and continued by Professor Ruggieri, who has only just resigned his office in consequence of his advanced age. At present nearly half of the whole city is excavated, and the circle of its walls determined. It is probable that the still unexcavated part will not contain many public buildings, perhaps a few temples and baths, but if the present slow rate of excavation be continued it will take another fifty or sixty years to lay the whole city bare. The shape of Pompeii is nearly oval; the city walls follow the slopes of the lava-hill on which it is built, only crossing that hill at the part where it rests against Mount Vesuvius. Pompeii was laid out on a fixed plan. The two principal streets, Strada di Mercurio and Strada di Nola, crossed it from north to south and from west to east. The side streets run crossways to these two, and only slightly deviate from the straight line at certain points. The city wall is preserved in its northern part and a great portion of its southern course, but on the west and at the west corner of its southern course it was already pulled down in ancient times, and its place occupied by houses. The wall has eight gates, to which distinguishing names have been given. The public buildings that have been found are situated in two groups—one around the Forum and the other near the Stabian Gate. But the public baths are distributed irregularly all over the city. The most important houses have been named according to very different reasons, some after distinguished persons who have witnessed their excavation; for example, the "House of the Grand Duke of Tuscany," others after objects of art found therein, as the "House of the Faun," and others again after their supposed proprietors, as the "House of Sallust." It is well to take notice of these names, as it is under them that the guides point out the buildings. A more reasonable method of naming is that from the bronze seals discovered in the houses, engraved with the names of the owners or from inscriptions.

The oldest building in Pompeii is the destroyed Doric temple, which belongs to the sixth century B.C. The city wall is also extremely ancient, but even an approximate date cannot be determined. The rest of the buildings belong to two distinct groups, according as they were built before or after the founding of the Roman colony in 80 B.C. The pre-Roman edifices are artistically the best. They were built under the direct influence of Greek culture, and show the pure, beautiful forms of the Doric, Ionic and Corinthian styles. Especially remarkable is the spirited style of the Corinthian capitals, built of no costly material. The columns and the beams are generally of grey tufa-stone, coated with white or coloured stucco; marble is rarely found. The technical work is also imperfect. But the Roman buildings, though of an inferior and often coarse style, are made of superior material, such as marble, or the fine limestone called travertine, and the workmanship is better. The Basilica, the Temple of Apollo, and probably the Temple of Jupiter, the oldest portions of the Forum, the so-called "School," the Stabian Baths, the large Theatre, the colonnades of the Triangular Forum, the barracks of the gladiators, the

Palæstra, the outer portion of the Porta Marina, and the inner portion of the other gates all belong to the public edifices of the pre-Roman period. To the early time of the Roman colony belong the Baths near the Forum, the small Theatre, the Amphitheatre, the Temple of the Capitoline Divinities, and the inner portion of the Porta Marina. All the other public buildings were built in the later Roman time.

The mural paintings belong to four successive styles. The first style, that of the pre-Roman period, consists in imitations of marble decorations in plastic stucco-work. There are no figures or pictures in this style. The second style, belonging to the time of the Roman Republic, consists in painted imitation of marble, and also in realistic, not fantastic, pictures with architectural subjects, showing edifices such as might have actually existed. The third style, that of the Roman Imperial period, till about 50 A.D., is ornamental decoration in the Egyptian taste, distinguished by pure and beautiful forms in tender and graduated colouring. The fourth style, belonging to the time immediately previous to the destruction of the city, shows a peculiar love for fantastic, slender, playful architectural subjects, and is the kind generally understood when we speak of Pompeian wall-paintings. The colouring is less delicate, the ornaments not so pure in form, but all are stronger and more effective. Especially admirable is the rich fancy displayed in the architectural decoration. Almost all the figure-subjects in the paintings of Pompeii belong to the third and fourth styles.

Pompeii was well and entirely paved in its earliest days, and well provided with drinking water. The Oscan and Latin inscriptions engraved or painted in red colour generally relate to elections; a few are announcements of games. What can be deciphered of the "graffiti" or scratched inscriptions show that they were individual effusions, the expressions of good wishes, the mention of games, verses, &c. A number of wooden tablets, coated with wax and inscribed, which were found in the house of the banker, L. Cæcilius Jucundus, have now been deciphered in the Naples Museum, and are mostly receipts.

The few fragments of the ancient Doric Temple on the Triangular Forum show that it greatly resembled the famous temples of Paestum and Selinus. The temple was already destroyed in the early days of Pompeii, and a shabby sanctuary erected in its place.

EAST RIDING ANTIQUARIAN SOCIETY.

THE second annual meeting of the East Riding Antiquarian Society was held at Driffield this week, and the proceedings lasted two days. A good number of the members from all parts of the Riding, as well as several from other parts of the county, the *Leeds Mercury* says, assembled in the Corn Exchange at one o'clock on Monday, when the annual report and balance-sheet were submitted and duly passed. The president, the Rev. Dr. Cox, F.S.A., took the chair, and was re-elected president for the ensuing year on the motion of Colonel Haworth Booth, seconded by Mr. Councillor Hall. The long list of vice-presidents were reappointed, with the addition of Lord Londesborough, who has just joined the Society. The council were reappointed with certain additions, and the Rev. A. N. Cooper, vicar of Filey, and Mr. Andrews, F.R.H.S., of Hull, were appointed joint hon. secretaries. Mr. Leach, F.S.A., read a paper on the "Beverley Town Register Book," which begins in 1436.

After a short interval for luncheon, the party reassembled at the Mortimer Museum, which has so great a repute among archaeologists of the prehistoric period. It contains a wonderfully-extensive and well-arranged collection of flint implements and pottery and other details pertaining to the Stone Age, as well as a few relics of the Bronze Age, which have been gathered together after many years patient toil by those well-known barrow-openers, the Messrs. Mortimer, from Yorkshire tumuli. It is admittedly by far the best English collection of prehistoric relics from any one given district, and supplied many of the examples which are described and illustrated in Sir John Evans's authoritative work on the "Ancient Stone Implements of Great Britain." The museum also contains a very good geological collection, but with that the antiquaries had no immediate concern. Short descriptions of the more important features were given by Mr. J. R. Mortimer and by the Rev. E. Maule Cole, the vicar of Wetwang, and by Dr. Cox, who drew attention to the smaller collection of Anglo-Saxon and Roman antiquities. Over 10,000 flint weapons are in this remarkable collection, as well as the contents of upwards of 300 Yorkshire barrows.

The members then proceeded to the fine church of All Saints, which was restored at a considerable cost by Sir Gilbert Scott in 1879-80. The Rev. Dr. Cox gave a general description of the building. He said that there seemed to be no trace here of a Domesday church, though at the time of the great survey Driffield was an important centre of Christianity, and possessed two churches, one of which doubtless was on this site, and the

other at Little Driffield. At a later Norman date a church on a considerable scale was erected here, as was shown by four round arches and supporting piers of the nave arcade on each side, separating it from the aisles. The clerestory windows above were also late Norman. It was rather difficult to judge of the date of this work, as it had been so extensively repaired and rebuilt (apparently a matter of necessity) at the time of the restoration; but perhaps it was transition from Norman to Early English, about the end of the twelfth century or beginning of the thirteenth, which was certainly the date of the fine circular south doorway, with its dog-tooth moulding. To the same date belonged the plainer north doorway. The consecration cross incised on the north jamb of the south doorway showed that there was a considerable rebuilding and enlargement of the fabric, involving a new position on fresh ground for the high altar at that date, otherwise consecration would not have been necessary. In the last half of the fourteenth century the south aisle was rebuilt, the windows being remarkable examples of late Decorated design. The tower, chancel and north aisle were of the Perpendicular period, about 1450. The noble tower was specially praised, the enrichment of the design in the upper stages insensibly drawing the eyes upward. After commenting on the early part, the piscina-drains, and the absence of old monuments, Dr. Cox referred to the registers, which begin in 1556, and are specially interesting in the Commonwealth during the time that marriages were celebrated before Justices of the Peace. He also commented on the still prevailing custom at Driffield of ringing the "Harvest Bell" at 5 A.M. and 7 P.M., and said that originally this denoted an unusually early hour for the daily mass, and for the daily evensong during the longer hours of labour at a time when English labourers were often habitual churchgoers. Dr. Cox contended that church bells were never originally used only as secular time-tellers, though the religious side of the custom had often died out, as was the case at Driffield. Mr. Temple Moore, the well-known architect, followed with a description of the changes effected in 1880, when he was engaged under Sir Gilbert Scott.

The Moot Hill was visited about four o'clock, when a short paper was read by the Rev. E. Maule Cole on "Folk Moots." He said that this Moot Hill had probably been originally a British barrow, and that it was afterwards enlarged and used as a place of public assembly, and for public proclamations. A brief discussion followed, which was taken part in by Dr. Cox, and by Messrs. Leach, Andrews and Hall.

A short walk of about a mile brought the party to Little Driffield, where the Rev. A. N. Cooper, vicar of Filey, read a brief but admirable paper on "King Alfred of Northumbria." He said that Alfred of Northumbria, like many illegitimate sons, far exceeded his legitimate brother in abilities and virtues. He came over from Saxony in 543, and made himself master of all the country north of the Humber. Northumbria, over which he reigned, had a fixed frontier on the south of the Humber, and on the north a movable one embracing two or three counties north of the Tweed, and sometimes going as far as the Forth. For over 100 years the kingdom was united or divided into two kingdoms of Bernicia and Deira. Alfred's father was Osway, and at the latter's death in 670, Alfred was rejected as king by the nobles on account of his illegitimate birth. For fourteen years, while his brother reigned, he retired into private life and study in Ireland, where he acquired great learning. Probably his studies would comprise jurisprudence, Latin poetry, arithmetic and astronomy. His reign was devoid of historic interest, except as to his quarrel with Bishop Wilfred, whom he drove out for encroaching on the royal prerogative, and not even a letter from the Pope would reinstate him. Mr. Cooper expressed his belief that Deira was the derivation of the name of Driffield. To this day there is a mound known as the "King's Mound" in the "King's Field." In conclusion, people were apt, he said, to speak contemptuously of the Anglo-Saxons, but he believed they were as well clothed and as well behaved as ourselves. King Alfred might be compared to the late Comte de Paris, both having betaken themselves to study, and he claimed for him a position worthy to rank with the best of our blood royal. Alfred the Wise died at Driffield in the year 705, and was buried in the old church of Little Driffield, as is recorded on a mural slab, the inscription of which has been often renewed, and is now rather absurdly worded "Northumberland," instead of Northumbria. This once interesting and early fabric was rebuilt and curtailed after a singularly bald and evil fashion in 1809; all the old work was destroyed, except the tower and part of the south wall of the chancel. In 1890 it was much improved, and the 1809 parts removed to make room for decent work by Mr. Temple Moore. That gentleman gave an interesting account of the fabric. The lower stage of the tower is Norman, and the upper stage is of fourteenth-century work. The tower arch, however, shows obvious traces of an arch older than the Norman, and hence there is little doubt that a portion of this part of the fabric is of pre-Conquest or Saxon date. In the walls are a large number of fragments of Norman incised grave

covers, as well as one piece of Saxon knot-work, which were pointed out by Dr. Cox.

The annual dinner was held at the Buck Inn at 6.30, when upwards of sixty of the members and their friends filled the tables. The President took the chair. The toasts were confined to "The Queen," "Success to the East Riding Antiquarian Society," and "Prosperity to Driffield." From eight to ten the members were entertained at a conversazione at Highfield, by the kind invitation of Mr. and Mrs. Harrison Holt. In the intervals of music short papers were read by the Rev. Marmaduke Morris, rector of Nunburnholme, on "East Riding Dialect in Agricultural Terms," and by Mr. Nicholson on "The Stocks of the Riding," and short addresses were given by Dr. Cox and Mr. Leach, F.S.A.

The most important feature of Tuesday's programme was the visit to Watton Priory, when the excavations just concluded were described by Mr. W. St. John Hope, secretary of the Society of Antiquaries, but which we have not space now to include.

SPECIFICATION WRITING.*

(Continued from page 190.)

I HAVE prepared some copies of the synopsis of the specifications I am accustomed to use. If you will refer to them I will go over them hastily, noting some of the more important matters, and will not further take up your time.

GENERAL WORKING SYNOPSIS OF SPECIFICATIONS.

Excavation.—(Refer to General Clauses.)

Top soil. Disposal of earth, cart it away? Deposit on lot—to grade—in piles? Depth of cellar. Depth of trenches. Inside, outside. Width of footings. Vault. Grease-trap.

Well.—Include walling, include manhole. Trenches for pipes. Include digging and refilling. Shoring of walls—adjoining. Shoring of earth banks, if necessary. Pumping of water, if any. Cleaning of old wells; filling of same.

Stonemason.—Refer to General Clauses.

Stone.—Cellar and backing; sizes, kind. Facings: sizes: kind of wall—broken-range, random-coursed, coursed. Dressed—how? rock-faced? All on natural bed: jambs dressed, arrises cut. Specify bonding.

Footings, Stone.—Depth, width, kind of stone, sizes; squared? edged?

Footings, concrete.—How mixed? who furnishes forms? Thickness layers, ramming. What cement? what sand? what proportion of each.

Testing of Cement.—For fineness—what mesh? Tensile. Compression. Boiling.

Thickness of Walls.—Piers, sizes. Cellarway. Foundation for steps.

Levelling of Walls.—For joists, sills, frames, heads, plates. Leaving chases for pipes, posts, flues. Building in blocks, strips, frames. Skew-backs for arches. Arches: what soffit, if necessary? cut? rough-face?

Mortar.—Any cement? what kind? Lime, any particular kiln or make?

Sand.—Bar, road, creek, bank? What proportions of lime, sand and cement, if any?

Pointing.—Lime mortar. Marble dust. Cement: what kind? any sand? what style of pointing? Anything as to bad earth foundations, rock in cellar: blast it, sledge it, plug and feather. Owner to pay per perch? owner to have?

Old Walls.—Stone to be reused, removed, contractors, owners. Who supplies water? Scaffolding, who supplies?

Cut Stone.—Pier-caps, chimney-caps, girder-blocks. All sizes, kind of stone, dressed. Ashlar: how thick? how clamped? Sills: moulded? plain? Cut to wash, throated. Heads: moulded? plain? Platforms: steps, balustrades, moulded rails? turned or square balusters? Bands: moulded? plain? left for carver? Columns: full diameter? half diameter? fluted? left for carver? Caps: left for carver? moulded? Pilasters: plain? panelled? left for carver? Cornices: size; projection; bed. Curbing: what kind? all sizes. All sizes, kind of stone, style of dressing. Marble or slate treads and risers to iron stairs?

Stone Pavement.—What kind? all sizes; dressed? rough? Any cutting for doors, manholes, plumbers' fittings? Remember to set sills free in middle. Remember that fine limestones must be laid in lime-mortar and that cement must not touch limestones in joints or backing.

Bricklayer.—(Refer to General Clauses.)

Who supplies scaffold? who furnishes water?

Bricks.—For cellar, piers, facing, backing, footings. What kind and colour? any particular make? how laid? what kind

* A lecture delivered before the Architectural Department of the University of Pennsylvania by Mr. T. Roney Williamson, architect, and published in the *American Architect and Builder*.

of mortar? If for footings, width, number of courses; what racking?

Bonding.—Old English? Flemish? behind facing? every fifth course headers?

Moulded Bricks.—Make, colour, kind. Catalogue number. Specify all inside and outside returns. Any lead covering on moulded bricks? Building in blocks, strips, frames. Levelling for joists, sills, frames, heads, plates. Chases for pipes, flues, posts.

Arches.—Flat, semicircular, archhead, elliptical, segmental. Bricks ground or moulded?

Mortar.—Cement? what kind? with sand? what proportion?

Cement Tests.—Boiling, tensile, compression—what fineness? what mesh?

Lime Mortar.—What lime, if any preference? what sand? what proportion?

Coloured Mortar.—What colour? any particular make of colour? Trimmer hearths. Ashpits. Foundation for range. Bricking of heater.

Fireplaces.—Backs and sides; what kind? state price; any dampers? Inside hearths; what kind? specify round hole and plate. Outside hearth; what kind? name price. Omit place in other trade? Brick finish on face of chimney-breast? what brick? Any porch piers? columns? any special chimneys? any brick pavements? Walls to be built from outside scaffold or overhead from trestles? Clean walls; oil walls?

Cisterns.—Brick? cemented? manholes, covers; padlocks? guarantee tightness.

Any Fireproofing.—Hollow tile? porous terra-cotta? brick arches? Specify sizes.

Any Damp-proofing.—Inside furring bricks? Any damp-proof under walls—aspalte? slate in cement?

Terra-cotta.—Name of maker; specify parts to be terra-cotta. Specify straightness, colour, even shade, square joints. Modelling. Omit? name price?

Old Material.—Clean and pile? use headers and bats? to be contractor's? owner's? reused or carted away? Wet bricks before using; how? Any joist hangers or sockets? if so, notify bricklayer to build in.

Mosaic Floors and Wainscot.—(Refer to General Clauses.) Name price per foot. Specify kind and pattern. Marble wainscot? floors? kind? thickness? finish? Other marble-work, if any. Tile hearths? facings? Name price per foot set. Floors, wainscot—mosaic?

Cement Floors and Pavements.

Specify method; thickness; who fills to cement level? Name kind: granolithic? metallithic? any other make? require guarantee.

Carpenter.—(Refer to General Clauses.)

Does carpenter superintend work? give sizes, heights, &c., from drawings. Who supplies scaffold for mason? for bricklayer? centres for arches? strips for furring? blocks for finish?

Joists.—Kind, sizes, backing and lining, where used? Porch? Framing hangers, double trimmers, headers, double under partitions. Framing for hearths, flues, stairways, lifts, skylights. Bridging, kind; how often? what sizes? Any hangers or sockets? what kind? whose make? Joists adzed for tile floor or mosaic? Floor cut-in for tile flooring or mosaic?

Girders.—Kind, sizes; bolted or spiked? framed level? or under joists? cleated?

Mill Construction.—Sizes of beams, material, plank floor, splined. Top floor: under flooring specification.

Posts.—Rough? turned? What kind? any bolsters? any brackets or struts?

Studs.—Material, sizes, double at corners? at openings? Pockets for sliding doors, line them?

Studs at Corners of Building.—Material, sizes, braced, what kind? Heads to partitions? Sizes.

Sill.—Sizes, material, bed in mortar; bolted to wall?

Girths.—Sizes, material; let into studs?

Plate.—Sizes, material.

Sheathing.—Material, thickness; surfaced? matched? laid diagonally?

Sheathing-paper.—Kind, trade, thickness.

Rafters.—Sizes, material, framing. Outlookers? rafter-ends cut to shape?

Trusses.—Describe fully with all rods, bolts, plates, shoes, &c.

Purlins, Valley Rafters, Hips.—Sizes, materials.

Roof-covering.—Sheathing, same as above. Paper: kind, trade-thickness. Shingles: lengths, widths, weathering, quality; trade terms? shapes?

Gutter-strips.—Size; iron brackets screwed on?

Eaves-troughs.—See "Tinner."

Rough Framing for cupolas, ventilators, trap-doors, cellar-ways, stair-horsings, porch-floors: sizes, material.

Rough Doors.—Cellarway, trap-doors, thickness; dressed? matched? battened? hinged? fastenings.

Flooring.—Material, quality, thickness. Kind: comb-

sawed? blind-nailed? face-nailed? width; matched? scraped? planed off all over? joints struck? put down after plastering; screwed down over pipes and wires. Rough floor under: kind, thickness, diagonal?

Ceilings.—Walls, lined? air-shafts, well-holes, elevator-shafts, dumb-waiter shafts, lined or cased? material; quality; beaded? matched? moulded? panelled?

Stalls.—Material; posts, turned? material. Loose boxes? standing-stalls? wood-carpet? parquetry?

Millwork (in Carpenter).

Cupolas, ventilators. Mouldings, posts, caps, louvres, finials, rails, balusters, cornices.

Box-frames.—Plank front? reveal; solid-heads? jib-heads? yellow-pine sills, parting-strips, sash-beads; veneers on box-faces? Twin frames; triple frames; double-hung weights? Outside shutters? outside blinds? thickness, material, hinges, all hardware. Inside blinds? thickness, material, panelled? rolling-slats? hinges; all hardware. Rolling-blinds? kind, material; look out for pockets.

Caseament-frames.—Thickness; moulded? transoms?

Sash.—Sizes, material; any jib-head sash? How hung: with hinges? lead-weights? iron-weights? sash-balances? brass-tape? bronze-chain? cords? How fastened? look out for right kind.

Fly-screens.—What make? special? thickness, kind of wire.

Inside-sills.—Kind, material; moulded?

Aprons.—Kind, material; moulded? Architraves, plain? with band? with cap? Material: any variation through building? Washboards, sizes, size of cap. Sub, sizes, if any. Material: any variation through building? Jamb-casings, head-linings: material, plain? moulded? Rebate-strips? sizes, material.

Boards for Pipes.—Material; moulded?

Casing over Chases for Pipes.—Panelled? screwed; brass-screws?

Shelving.—Material.

Pin-rails.—Material; hooks? wooden pins?

Dressers.—Pantry: with glass doors? panelled doors? hardware; material. Kitchen: Material, hardware; drawers? cupboard under?

Drain-boards.—Material.

Porches.—Describe fully: mouldings? turnings? brackets? carvings? lump sum? name carver? omit? contractor to supply material for carving?

Front Door.—Frame: size, material; panelled-jambs? transom, moulded? transom sash: thickness, pivoted? hinged? fixed? all hardware. Doors: thickness, material, moulded? panelled? with glass? double? single? Dutch? (if Dutch, look out). All hardware? If hardwood, veneered.

Vestibule Doors.—Side-lights? fixed? sash? thickness. Transom, moulded? transom sash: thickness, pivoted? hinged? fixed? all hardware. Doors: thickness, material; same as front door? for glass? all hardware. If hardwood, veneered.

Inside Doors Hung.—Thickness, material, number of panels; moulded? all hardware. Closet doors, same? all hardware. If hardwood, veneered.

Sliding Doors.—Thickness, material, number of panels; double or single? astragal or rebate joint? with edge strips? all hardware. If hardwood, veneered.

Doors to Water-closets.—Slat? panelled? short? spring-hinges? all hardware.

Doors to Shower Baths.—Slat? panelled? short? spring-hinges? all hardware; material.

Wainscot.—Thickness; mouldings? panels? note carving, if any.

Outside Steps.—Framing, material, moulding, setting.

Cornices, Pediments.—Material, quality, mouldings, brackets; any carving? lump sum? omit?

Stairways.—Back stairs: treads, nosed, risers, string, housings; open string? rail, balusters, posts, mouldings. Main stairs: lump sum? without horses? without finishing?

Water-troughs.—Material, ploughed joints? white-leaded? straining-rods?

Feed-bins.—Material; zinc-lined?

Mantels.—Price fixed? omitted?

Elevator-screens.—Material.

Dumb-waiters.—Kind, make; price allowed? omitted? Sliding sash-partitions. Pulpits. Altars. Altar-rails. Pews. Benches. Vestment-lockers. Choir-lockers. Reredos. Hotel-counters. Desks. Bank-partitions. Bank-counters. Counters. Store-fixtures. Show-cases. Book-cases. China-closets. Harness-closets. Picture-mouldings. Ceiling-beams. Paneling. Does carpenter close in openings with muslin in cold weather before glazing?

Plumber.—(Refer to General Clauses.)

Permits. Sewer-connections. Board of Health rules.

Drain-pipe.—Jointing, cement, sizes, kind; for soil; for rain-conductors. Is drainage to city sewer? well? flush-tank? who digs? where? Is drainage Waring's system? done by patentee or plumber?

Soil-pipe.—Size, weight, trade weight or mark; coated? all fittings; trap, running-trap, clean-out, lead-joints; carry soil-pipes through roof; any anti-syphon pipes? test soil-pipes to three pounds pressure.

Supply-pipe from Main.—Material, size, joints—wiped if lead, screw if iron galvanised; stop-and-waste; pave-wash; if lead-pipe, give weight per foot.

Supply-pipes in House.—Sizes, materials, to each fixture; lateral runs below floors; stops-and-wastes on rising branches; tags on faucets; boiler-connection, hot-water supply, proper supports, brass ferrules for lead-connections, wiped joints on lead pipe. Pipes exposed? if so, nickel, or bronzed?

Tank.—Wood? cedar, size or number of gallons; number hoops; iron? painted? galvanised? size, number of gallons; overflow; drain, where to? stop on drain-pipe.

Safety-tray.—Lead? zinc? number pounds to foot; waste from same to cellar floor? to outside building?

Waste-pipes.—Material, sizes; when exposed, nickel-plated brass? lead? give weight; galvanised iron? cast-iron coated? give trade weight; carry waste through roof, anti-syphon pipes? does waste join soil-pipe? any grease-traps?—brick or at fixture? does waste run separate to well? to sewer?

Traps.—On all fixtures; what kind—"Bennor?" "Cudell?" "Puro?" "Bower?" brass? lead?

Fixtures.—Give catalogue page and numbers, if possible, and how many of each.

Water-closets.—Include seat and lid? cistern? marble under water-closet?

Bath-tub.—Cased? splash-board? what kind? marble under? what waste? what faucets? sprinkler? silver or nickel?

Washstands.—Iron? marble? exposed? apron, brackets or legs? bowl—oval? round? size; decorated? plain? waste fixture, what kind—silver-plated? nickel? faucets—what make, silver or nickel?

Hip-bath.—What kind? silver or nickel trimmings?

Shower-bath.—What kind? silver or nickel trimmings?

Pantry Sink.—Porcelain? copper? enamelled iron? exposed? kind of faucets; make; silver? nickel? brass?

Kitchen Sink.—Size, kind, make, legs? brackets? back? faucets, kind, make; brass?

Stationary Wash-trays.—What kind—soapstone? enamelled iron? porcelain? wood? indurated fibre? with lids? what wood? what faucets—brass?

Urinals.—What kind? make? with marble or slate backs, floors, sides? Automatic, or with faucets? Waste from floors.

Stop Sinks.—Galvanised? painted? enamelled? porcelain? Any marble or slate enclosures for water-closets? marble floors? Do washstands stand in rows? marble tops jointed or in one? Are shower-baths enclosed in marble or slate partitions?

Circulating Boiler.—What make? self-cleaning? on stand? on wall? waste; sediment-cock; galvanised iron? copper? copper connections? galvanised iron connections?

Range.—Stationary; who sets? portable? slate bottom? slate hearth? zinc hearth? plate-warmers?

Hotel Fixtures.—Broilers, boilers, steam-cookers, plate-washers, mangle, washing-machines, hot tables?

Gas Piping.—Permits. Comply with gas company's rules and regulations. Test system. Cap outlets. Pipe to grade to meter connection; stop-and-waste. No drops in pipe to outlets. No cutting of joists at greater distance than one foot from bearing. Measure for all outlets to centre of ceilings or heights and position on walls. No pipe smaller than one-half of an inch. Specify sizes of mains and branches. Are pipes to be exposed?

Any Hot-water Heaters.—Who supplies? who connects—heater-contractor? or plumber? Any stable? bell-traps, stalls, gutters. Hydrants with stop-and-waste below frost?

(To be continued.)



Ventilation of Theatres.

SIR,—May I hope that one or two of your readers have to do with theatres, either as builders, managers or architects thereof, and that they may turn their attention to a matter which the medical profession, through their mouthpiece, Dr. Parkes, think to be of the utmost importance. I allude to the great need of fresh air in theatres. To the clergy I feel it hopeless to appeal; the outcome of correspondence on this subject a year or so ago in a Church paper shows them to be utterly indifferent to the ordinary rules of health as well as to the bodily needs of their flocks—hence I venture to appeal to sensible people through your columns.

I do not know the builders, architects, or Mr. Standen

Triggs, of Devonshire Park Theatre, Eastbourne, and have no interest in the takings of any theatre; so I merely wish to ask why, quite disinterestedly, most theatres—Devonshire Park being the only exception I know of—are neither more nor less than the Black Hole of Calcutta redivivus, and no care taken whatever to insure the comfort of the audience, a mixture of odours of humanity and gas being very prevalent?

Take any London theatre. Here I pay 10s. 6d. for my stall and 6d. for a programme, and generally have to leave an hour after the performance has begun, in a state of semi-faintness or suffocation. But Mr. Standen Triggs knows how to secure the comfort of the public in general, and mine in particular, and I trust if any of your readers wish to know how he does so, they will pervade his theatre and inspect it very closely. They will judge for themselves that I am right in saying, for I took a stall one night and a gallery-seat the night following to test the ventilation as well as the view I could get of the stage, and I note (1) that the worst seat in the gallery gets as good a view as the best stall; (2) that nothing could exceed the efficient ventilation; (3) that in the gallery, as well as in the stalls, I could sit through the whole performance and inhale fresh air the whole time. The nearest approach to Mr. Standen Triggs's arrangement is to be found at the Pavilion Music Hall, London.—Yours faithfully,

H. J. CUNLIFFE (M.A., Oxon).

New University Club, London.

GENERAL.

The Council of the Society of Engineers have unanimously elected Mr. Perry F. Nursey, a past president, and for thirty-six years a member of the Society, as honorary secretary and treasurer, in place of the late Mr. Alfred Williams, who had occupied the position since the foundation of the Society in 1854.

The Partnership between Mr. Collings Beatson Young and Mr. Arthur George Spencer, architects and surveyors (Young & Spencer), has been dissolved by mutual consent.

Mr. T. W. Baker, B.A., will read a paper on "The Utilisation of Town Refuse for Generating Steam," at the meeting of the Society of Engineers, on Monday, October 1.

Dunboy Castle, near Berehaven Harbour, on the south coast of Ireland, which is one of the finest buildings in Ireland, took fire on Monday.

Thursday, October 4, has been appointed for the reception of works of art intended for the autumn exhibition (the thirty-ninth) of the Nineteenth Century Art Society, at the Conduit Street galleries.

Articles on the "Design and Specification of Electric Lighting Works, for Architects and Civil Engineers," by Mr. Howard Pentland, of Dublin, and Mr. Gibbings, of Hull, will be commenced next week in *Electricity*.

Professor Alleyne Nicholson will commence a course of twelve lectures under the Swiney Trust, on the "Earth's Crust," in the lecture theatre of the South Kensington Museum on Monday.

Two Marble Statues have been discovered in excavations at the Mirror Palace at Sainte Colombe de Vienne (Rhône). One is over 6½ feet without the pedestal, and apparently represents Rome. The head was recovered, but the arms are missing. Lying at the feet of the figure are a helmet and the vestige of a shield. The second is about 3 feet in height, and represents a child standing erect on a pedestal, but the head has not yet been found.

Mr. G. F. Watts, R.A., has received from Washington an engrossed copy of the Act of Congress, accepting on behalf of the American nation his picture *Love and Life*, which he presented to the United States after its exhibition at the Chicago World's Fair.

An Old Chest which lay for many years in the Custom House, Greenock, is now supposed to be one of the treasure chests which belonged to a vessel of the Spanish Armada, and it has been forwarded to London.

A Sum of 500l. has been placed at the disposal of the vicar of Bromley, by Mrs. Courage, for the restoration and decoration of the chancel of the parish church.

The Seventh Autumn Exhibition was opened on Wednesday at Dudley in the Corporation Art Gallery. About 150 works are shown, not a numerous collection as compared with the past, but far exceeding the usual order of merit.

The Private View of the collection of works by living marine painters will be held to-morrow (Saturday) in the Birmingham Art Gallery.

At the Meeting of the Australian Institute of Architects, Sydney, the following were elected office-bearers for the ensuing year:—President, Mr. J. Horbury Hunt; vice-president, Mr. J. B. Barlow; hon. secretary, Mr. J. J. Davey; hon. treasurer, Mr. J. M'Donald; members of Council, Messrs. W. G. Coward, W. Kenwood, T. Rowe, A. Thornley and H. A. Wilshire.

The Architect.

THE WEEK.

AN accident has occurred in Dublin during the demolition of a part of a building which merits more attention than cases of the kind commonly obtain. On the south side of the river Liffey runs a quay known as Sir John Rogerson's on which towards the eastern end are manufactories which in no other city would be allowed to be opened so near to the inhabited parts. Among them are the works of the United Alkali Company. It was arranged to pull down a disused furnace. While a couple of men were engaged in the operation a brick archway, which was a few feet away, collapsed, and a large portion of it falling on one of the men killed him. It required thirty men to remove the debris, and they were engaged for twenty minutes before the corpse could be extricated. At the inquest the foreman of the works said that the demolition on which the men were employed could not interfere with the arch. What was the cause of the accident? Many people in Dublin would say that the water of the Liffey does find its way to the ground alongside the quays, and, moreover, there is a canal basin at a higher level on the opposite side, from which water could easily descend. It is easy to imagine that any intrusion of water would affect the foundations of an arch which was not in a perfect condition. On the north side of the river a large goods store belonging to a railway company collapsed before it was used. It was then discovered that the foundations which appeared secure were on a layer of the hardest gravel, that rested on mud. Mr. STRYPE, an engineer who gave evidence on the inquest about the accident at the alkali works, considered that the cause was not a settlement of brickwork. He stated that he believed the archway fell in consequence of the contraction of the mass of masonry during cooling after long exposure to heat. The contraction would produce a pressure which would be imperceptible except to an expert. The condition of the archway was dangerous, but it would take a highly-skilled person to appreciate the danger. It would have been advisable to have the place examined by a skilled person before the work was entered upon, but it was usual in such work to employ men of the class to which the deceased belonged. He considered that the work in which the man was employed did not cause the falling of the masonry. With Celtic impetuosity the Coroner declared that in his opinion the Alkali Company had been guilty of negligence in not having the place examined by a skilled person. Now Mr. STRYPE may have discerned the real cause of the accident; but, after all, he was only putting forth a supposition. The expansion and contraction of brickwork are not subjects for which much trustworthy data are recorded. Thousands of furnaces are allowed to cool, and are left years without examination, and yet accidents do not occur to men who come near them. The Dublin arch, we believe, was not subjected to strains for years, unless of the imperceptible kind which arise from the mutations of climate. Under such circumstances can we suppose that a collapse could occur which is all but unknown in great ironworks and other places where the heat was likely to surpass the Dublin temperature?

On next Monday evening Mr. W. ANDERSON, F.R.C.S., will commence a course of six lectures on anatomy at the Royal Academy. The demonstrations will begin on October 29. The subjects of the lectures on chemistry by Mr. A. H. CHURCH (of which the first will be given on November 19) are grounds for painting, pigments, selected palettes, vehicles and varnishes, methods of painting and conservation of pictures. The subjects of Mr. J. E. HODGSON'S and Mr. G. AITCHISON'S lectures are not announced. The arrangements for the delivery of lectures on sculpture have not yet been made. If the constitution of the Academy allowed, it would be better to give up lecturing on subjects like architecture, painting and sculpture, for as time goes on the inutility of such short courses becomes more apparent.

"DISCOVERIES in Architecture" will form the subject of Professor ROGER SMITH'S public opening lecture at University College, on Thursday evening, the 11th inst. Among other illustrations it is intended to show by the lantern photographs of the remarkable Greek sarcophagi, covered with fine sculpture and architectural decorations, which were discovered some years ago at Sidon. The Metropolitan Building Act, 1894, will form the principal subject of Professor ROGER SMITH'S lectures to his class of modern practice at University College, London, in the session about to commence.

THE next session of the Architectural Association will begin with a conversazione on Friday next. The annual general meeting will be held on the 26th inst., when Mr. E. W. MOUNTFORD will deliver an address. The following papers will be read at the ordinary meetings:—"The Study of Modern Architecture," by Mr. A. BERESFORD PRITE; "Sanitation in Regard to Hospitals and Infirmaries," by Mr. KEITH D. YOUNG; "The Modern Theatre of the Continent," by Mr. E. O. SACHS; "Architectural Illustration," by Mr. C. G. HARPER; "Bricks," by Mr. JOHN SLATER, B.A.; "Architectural Perspective," by Mr. W. S. WEATHERLEY; "The Bridges of London, Architecturally Considered, with Illustrations," by Mr. H. H. STATHAM; "The Use of Sculptural Decoration at the Present Time," by Mr. T. STIRLING LEE; "Plaster Work," by Mr. F. W. POMEROY; "Iron and Brass," by Mr. J. W. SINGER; "Specifications, from a Builder's Point of View," by Mr. HENRY HOLLOWAY; "Specifications, from an Architect's Point of View," by Mr. EDWIN C. PINKS; "Painting and its Relation to Architecture," by Mr. C. W. WHALL; "Treillage," by Mr. JOHN BELCHER; "The Influence of Architectural Style upon Design," by Mr. WALTER CRANE.

ST. ENOCH'S CHURCH, which, from its proximity to the principal railway terminus, becomes soon familiar to English visitors to Glasgow, seems to be doomed to removal. Owing to underground works the building has become unsafe, and the Presbytery of Glasgow, considering that it would take a very considerable sum to put the church into a proper state of repair so as to make it again available for the purpose of public worship, have decided that "it would be to the interests of all parties if the church were removed from its present position to some locality where it might be of greater benefit." The neighbourhood of the Normal School, in the angle between Garscube Road and New City Road, has been indicated as a suitable site. It is also proposed to remove the Tron Church. The churches committee of the Town Council have recommended that if a satisfactory site can be found, and arrangements come to as to the erection of a suitable structure under which the interests of the parishioners of St. Enoch's can be conserved, the committee recommend that arrangements should be made under which St. Enoch's Church may be removed from its present site; that the committee should be instructed to consider the present position of the Tron Church, and, having regard to the requirements of the district in which it is at present situated, to report as to what arrangements should be made to effect the removal of that fabric; also that the committee be empowered to enter into negotiations with the Presbytery of Glasgow in connection with the various matters above alluded to.

THE Parisians have resolved on another imitation of an English aid to sanitation. A "destructor" is to be set up at Javel for dealing with kitchen refuse. The Leeds type has been adopted, for the experts who were sent over to study the question came to the conclusion that it produced the most satisfactory results. The French are the most economical of all people, and it is believed that sufficient fuel will be obtained from the chips that are left after the forming of wood-blocks for paving, a kind of work which is also in progress at Javel. The works have been just commenced, and the crematory is expected to be completed at the beginning of next year. If, after a year's trial, the anticipations are realised, several other destructors will be set up by the Municipal Council.

THE LONDON BUILDING ACT, 1894.—II.

WHENEVER an iron building or other structure to which the general provisions in the sixth part of the Act are inapplicable is to be erected, the builder is to make application to the Council, and send in plans and particulars of the construction. If satisfactory, approval shall be signified, but "the Council shall not authorise any building of the warehouse class to be erected of greater cubical extent than 250,000 cubic feet except in accordance with the foregoing provisions of the Act." The Council can also issue general rules respecting applications, plans, expenses connected with special and temporary buildings. All expenses incurred are to be paid by builder to the superintending architect or other officer, and in default payment may be recovered in a summary manner. A copy of plans and particulars as approved is to be furnished to the district surveyor, whose duty it will be to ascertain that the building is carried out accordingly.

When approving of plans of a temporary building the Council can limit the period during which it will be allowed to remain, and impose such conditions about removal as they think fit. If the conditions are not observed, occupier or owner can be summoned to a petty sessional court, and if the complaint is proved, an order will be issued authorising Council to remove or take down the building and convey the materials to a convenient place, and unless all expenses are paid within fourteen days sell the same.

Except hoardings enclosing vacant land and which are not to exceed 12 feet in height, no wooden structure is to be erected without a license from the Council. Movable or temporary structures erected by a builder for his use during the construction, alteration or repair of a building and which are immediately removed after the work is accomplished are not comprised under the section. Nor are hoardings duly licensed by local authority, or piles, stacks or stores of timber not being a structure affixed or fastened to the ground.

The eighth part relates to the

Rights of Building and Adjoining Owners,

and in it there is hardly any departure from the Act of 1855.

Where lands of different owners adjoin and are unbuilt on at the line of junction, and either owner is about to build a party wall, he may serve notice on the adjoining owner describing the intended wall. If the adjoining owner consent the wall is to be built half on the land of each or in such other position as may be agreed upon. The expense of the building is to be defrayed by the two owners in due proportion, regard being had to the use they make of the wall. If the adjoining owner will not consent, the wall is to be built not otherwise than as an external wall on the building owner's land. If the building owner desires to build an external wall on his own land instead of a party wall, he may serve notice to that effect on the adjoining owner. In either of the cases and after a month from the service of the notice, the building owner shall have the right to form the footings of the external wall with a concrete or other solid substructure on the land of the adjoining owner, but making compensation for any damage that may arise. When an external wall is built against another external wall or against a party wall, it shall be lawful for the district surveyor to allow the footing on one side to be omitted.

A building owner is to have the following rights in party structures, viz. (1) to make good, underpin or repair one which is defective or out of repair; (2) to pull down and rebuild one when necessary; (3) to pull down any timber or other partition which divides buildings and is not conformable with the Act, and to build instead a party wall; (4) in cases where rooms and storeys belonging to different owners are intermixed, to pull them down, or the parts which do not conform with the Act, and to rebuild the same; (5) where buildings are connected by arches or communications over public ways or passages belonging to other persons, to take down and rebuild the parts that are not in conformity with the Act; (6) to raise and underpin any party structure permitted by the Act or any external wall built against such party structure on condition of making good all damage to "the adjoining premises

or to the internal finishings and decorations thereof, and of carrying up to the requisite height all flues and chimney-stacks belonging to the adjoining owner on or against such party structure or external wall;" (7) to pull down any party structure which is of insufficient strength for any building that is intended to be built, and to rebuild the same of sufficient strength, making good all damage; (8) to cut into any party structure on the same condition; (9) to cut away any footing or any chimney-breasts, jambs, or flues, or other projections, from any party wall or external walls in order to erect an external wall against such party wall, or for any other purpose; (10) to cut away or take down such parts of any wall or building of an adjoining owner as may be necessary in consequence of their overhanging the ground of the building owner, in order to erect an upright wall against the same. In all these cases the condition of making good all damage is prescribed. (11) A right to perform any other necessary works incident to the connection of a party structure with the adjoining premises. But the above rights are subject to the qualification that any building erected before January 1, 1895, if conformable with the Acts regulating buildings in London then in force, is to be deemed conformable with the provisions of the new Act. (12) A right to raise a party fence wall, or to pull the same down and rebuild it as a party wall.

The adjoining owner retains his rights as defined in the preceding Acts. He may require the construction of such chimney-copings, jambs, breasts, flues or similar works which may be fairly required for the convenience of the adjoining owner. It will be the duty of the building owner to comply with the requisition in all cases where the works will not be injurious, inconvenient, or cause unnecessary delay to him. Any differences on the subject to be settled by surveyors representing the parties.

Without the consent of the adjoining owner and occupiers, or when a party structure has become dangerous, (1) a building owner is not to exercise any of his rights unless at least two months before doing so (it used to be three months) he has served notice on the adjoining owner stating the nature and particulars of the proposed work and the time at which it is to be commenced. (2) Where a building owner lays open any part of the adjoining land or building, he is bound to provide a proper hoarding, shoring, or temporary construction for its protection and the security of the adjoining occupier. (3) The rights are not to be exercised in such manner or at such time as to cause unnecessary inconvenience to the adjoining owner or occupier. A party wall notice is of no avail unless the work is begun within six months and is prosecuted with due diligence. Within a month after receipt of notice the adjoining owner may serve on a building owner a notice requiring him to build on the proposed party structure any of the works specified to which the adjoining owner is entitled. The notice is to be accompanied with plans and drawings if necessary. If either owner do not within fourteen days after service of notice express his consent, he shall be considered as having dissented, and a difference shall be deemed to have arisen between the two owners.

In cases of difference between building and adjoining owners, unless both can concur in the appointment of one surveyor to arrange the matter, each owner is to appoint a surveyor, and the two surveyors shall select a third, and "such one surveyor, or three surveyors, or any two of them, shall settle any matter from time to time during the continuance of any work to which the notice relates." Any award given shall be conclusive and shall not be questioned in any court, but either of the parties may appeal to the county court "within fourteen days of delivery of award, and the county court may rescind the award or modify it in such manner as it thinks just." If either party make default in appointing a surveyor the party giving the notice may make the appointment. The costs incurred in making or obtaining the award shall be paid by such party as the surveyor or surveyors determine. If an appellant from the award convinces the county court judge that in the event of the matter being decided against him he will be liable to pay 50% exclusive of costs, the appellant may bring an action in the High Court against the other party to the difference.

Where both parties have concurred in the appointment

of one surveyor, if he refuse or for seven days neglects to act, the matters in dispute shall be determined as if he had not been appointed. In any case where there are two surveyors who appoint a third, and the latter neglects to act, another third surveyor is to be appointed instead. If the two surveyors neglect to select a third, a Secretary of State can select some fit person to act as third surveyor. If one of the two surveyors should die or become incapable to act, the party he represented can appoint a successor to him, and failing to do so the "other surveyor shall be as effectual as if he had been a single surveyor in whose appointment both parties had concurred." After giving fourteen days notice a building owner and his workmen can enter on any premises for the purpose of executing work, and if the premises are closed they may break open any fences or doors if accompanied by a constable or officer of the peace in order to effect such entry. Where a building owner intends to erect a building within 10 feet of a building belonging to an adjoining owner, any part of which extends to a lower level than the foundations of the latter, he may, or if required shall, underpin or otherwise strengthen the foundations. Notice of the operations accompanied by a plan and section is to be given. If the adjoining owner objects, then a difference shall be deemed to have arisen. The building owner shall be liable to compensate the adjoining owner and occupier for any inconvenience caused, and he will continue to be liable for any other injuries which may arise.

An adjoining owner may require the building owner before commencing operations to give security for the payment of all expenses, costs and compensation in respect of the work. The building owner may also demand security.

The rules as to expenses to be borne jointly by the building owner and adjoining owner, and as to expenses to be borne by the building owner, correspond with those of 1855. It is added that if any fence wall be raised for a building, and if any fence wall be pulled down and built as a party wall, the building owner is to pay for the operations. But if an adjoining owner should at any time make more use of a party wall or external wall than before alteration was made, he is to bear a due proportion of the expenses. If the adjoining owner object to the amount claimed, the difference is to be determined in the way provided for in the Act, and until contribution is paid the party structure is to belong to the building owner. The adjoining owner is to be liable for all expenses incurred on his requisition. Nothing in the Act is to authorise any interference with an easement of light, or other easements in or relating to a party wall, or take away, abridge, or prejudicially affect any right of any person to preserve or restore any light or other thing in or connected with a party wall in case of the party wall being pulled down or rebuilt.

The ninth part of the Act is devoted to

Dangerous and Neglected Structures,

and it combines the enactments of the Acts of 1855 and 1878. The term "structure" comprises any building, wall or other structure and anything affixed to or projecting from them. When it is made known to the County Council (in cases where a structure is found in the City, the Commissioners of Sewers are to take the place of the Council) that any structure is in a dangerous state, a survey is to be made by the district surveyor or some other competent surveyor. If the certificate given by the surveyor is to the effect that the structure is in a dangerous state, the Council can cause the same to be shored up or otherwise secured and a hoard or fence put up for the protection of passengers. Notice is to be given to the owner or occupier requiring him forthwith to take down, secure or repair the structure as the case requires. If the owner or occupier should fail to comply with the order as speedily as the nature of the case permits, and if the order of a petty sessional court to the same effect is also neglected, "the Council may with all convenient speed cause all or so much of the structure as is in a dangerous condition to be taken down, repaired or otherwise secured in such manner as may be requisite." The owner can require that the subject shall be referred to arbitration and "the notice served by the Council shall be discharged, amended or confirmed in accordance with the decision of the two surveyors or the arbitrator as the case may be."

Notwithstanding the arbitration, a petty sessional court on complaint of the Council can make any order which it may think fit with respect to the taking down, repairing or otherwise securing the structure.

All expenses incurred by the Council are to be paid by the owner of the structure, but without prejudice to his right to recover the same from any person liable to the expenses of repairs. If the owner will not pay, the Council can sell the structure, paying any surplus over expenses to him on demand. If proceeds are insufficient to repay the expenses, no part of the land on which the structure stands or stood is to be built upon until after the balance is paid. The Council can also recover expenses or balance thereof and all costs from the owner in a summary manner. The inmates of a dangerous structure are to be removed therefrom by a constable or other peace officer, and if they have no other abode he may require that they be received into the workhouse for the place.

Where a structure is ruinous or so far dilapidated as thereby to have become unfit for use or occupation, or is prejudicial to the property or the inhabitants of the neighbourhood, the Council can order the owner to fence in ground or put property into a state of repair within a reasonable time, and if the order is disobeyed may take down the structure and remove the materials. Afterwards expenses can be recovered, and the ground is not to be used for building until they are paid.

The tenth part contains the regulations for

Dangerous and Noxious Businesses.

A building is not to be erected within 50 feet of a building used for any dangerous purpose. But if one had been erected at a less distance before August 9, 1844, it may be rebuilt if it is ever pulled down, burnt or destroyed by tempest. A dangerous business is not to be established or carried on in any building or vault or in the open air at a less distance than 40 feet from a public way or 50 feet from any other building or vacant ground which does not belong to the same owner. The manufacture of matches ignitable by friction or otherwise, or other substances liable to sudden explosion, inflammation or ignition, or turpentine, naphtha, varnish, tar, resin, Brunswick black, and any other manufacture in which the materials or substances employed are liable to sudden fire or explosion, are to be deemed dangerous businesses.

Similar regulations are to be enforced in respect of noxious businesses, such as blood or bone-boiling.

The eleventh part of the Act deals with

Dwelling-houses on Low-lying Land.

A building to be used wholly or partly as a dwelling-house is not to be erected or adapted, without the permission of the Council, on land of which the surface is below Trinity high-water mark, and does not admit of being drained by gravitation into an existing sewer of the Council. The Council can prescribe regulations prohibiting the erection or adaptation of dwelling-houses on such land or on defined areas of it, or can prescribe the level at which the under-side of the lowest floor is to be placed, or insist on other provisions for drainage, &c. Applications for licenses must be made by any person seeking to erect dwelling-houses, and the matter shall be referred by the Council to their chief engineer, in order to determine upon what conditions the erection or adaptation can be permitted. The regulations of the Council are to be published from time to time in London and local newspapers.

Sky-signs

are the subject of the twelfth part. From and after the commencement of the Act—that is, January 1, 1895—it shall be unlawful to erect any sky-sign as defined in the Act. Existing sky-signs cannot be retained or renewed without a license. A license granted under the Act of 1891, and renewed under the same Act, may be renewed for one further period of two years, but not longer. A license granted under the Act of 1893 may be renewed from the expiration of a period of two years from the date of issue of such license for a further period of two years, and on the expiration of that period for one other period of two years, making, with the original term of the license, six years in all, but not longer. A license becomes void if any addi-

tion is made to the sky-sign except for the purpose of making it secure under the direction of the surveyor, or if any change be made in the sky-sign, or if the sign or a part fall through accident, decay or other cause, or if any addition be made to the building which involves the disturbance of the sky-sign, or if the building become unoccupied or be demolished or destroyed. The Council can take proceedings for the removal of sky-signs, or order any of their officers, servants or workmen to take them down and remove them, and to execute any works which may be necessary for that purpose.

The Superintending Architect and District Surveyors

enjoy the privilege of having the thirteenth part to themselves. There is not much difference between the old and the new clauses relating to them. The extent of the surveyors' duties is thus defined:—"Subject to the provisions of this Act and to the exemptions in this Act mentioned, every building or structure and every work done to, in or upon any building or structure, and all matters relating to the width and direction of streets, the general line of buildings in streets, the provision of open spaces about buildings and the height of buildings, shall be subject to the supervision of the district surveyor appointed to the district in which the building or structure is situate." The Council still retain the power to alter the limits of a district, or to unite two or more and place such altered district under the supervision of any district surveyor. The consent of a Secretary of State continues to be necessary for the dismissal of a surveyor who held office when the Act of 1855 was passed, but all others may be dismissed or suspended by the Council. The examination of candidates is entrusted to the Institute of Architects, but the reservation of "such other manner (of examination) as the Council may direct" continues. The surveyor may appoint a deputy in case illness, infirmity or other unavoidable circumstance prevents his attendance to the duties of his office, or the Council may appoint any other district surveyor or person to assist in such a case. The surveyor is not to act in the case of works under his professional superintendence any more than formerly.

The notices to be given by the builder to the surveyor continue the practice which is now observed, and the position of the surveyor in respect to building works is unchanged. In cases when irregularities occur, the surveyor is to serve the builder with a notice requiring him within forty-eight hours to carry out the amendment needed, or to cut into, lay open or pull down so much work as prevents the surveyor from ascertaining whether anything has been omitted or done in a wrong manner. A notice of irregularity can also be given after the completion of the building. If notice in writing has been given to the district surveyor by the builder or owner of the date at which the building has ceased to be under the control of the builder, then at any time within fourteen days after its receipt a notice of irregularity may be served on the owner or occupier or other person who has caused the work, instead of or in addition to the builder (if any). Where no such notice has been served on district surveyor, a notice of irregularity can be served on owner or occupier within twenty-one days. When the owner does not allow the builder to comply with the requisition, of a notice of irregularity served on the builder, and the builder serves notice on the district surveyor to that effect, a notice of irregularity can be served within fourteen days on owner or occupier. The consequences of such a notice, so far as they relate to the builder, shall apply to the owner, occupier, or other person served, but nothing in the section is to prejudice any remedy of an owner, occupier, or other person against the builder. Summary proceedings can be taken for non-compliance with the notice, and the Council can employ workmen to bring the work into conformity with the provisions of the Act.

The fees to a district surveyor are to be paid by the builder, or in his default by owner or occupier. Fees for services in the laying-out or formation of streets, lines of building frontage and any like service, will be paid by Council, as well as fees for preparation or giving of evidence before Tribunal of Appeal. A month used to be allowed for the payment of fees after the roof of a building had been covered in; henceforth only fourteen days are to expire,

and the same period is given for payment of fees in any work placed under the supervision of a district surveyor or for any special service performed by him. If fees are refused they can be recovered in a summary manner. The Council can substitute the payment of a fixed salary instead of fees, the fees being carried to the credit of the county fund. The Council can also abolish or reduce the fees, and pay the surveyors wholly or partially by salaries. The Council may undertake on behalf of a district surveyor any proceedings which would otherwise be undertaken by him.

By-laws.

The Council have the power under the fourteenth part of the Act to make such by-laws as are not repugnant or contrary to the provisions of the Act on the following matters:—Regulation of plans of new streets; plans and levels of sites for buildings; forms of notice and other documents; foundations and sites of buildings; mode in which materials are to be made, excavated, filled up, prepared and completed; thickness, description and quality of substances used in walls; dimensions of wooden bressummers; dimensions of joists of floors; protection of iron-work; woodwork in external walls; substances of which plastering may be made; materials used in filling up excavations within a house or 3 feet therefrom; lamp signs or other structures overhanging the public way; means of escape from fire in buildings over 60 feet high; duties of district surveyors in relation to by-laws; deposit of plans with district surveyors; fees to district surveyors; the imposition for every offence committed against any by-laws made under the Act of a penalty not exceeding 5*l.* and a daily penalty not exceeding 2*l.* for every day during which such offence continues after conviction. The by-laws are to be without force or effect until approved by the Local Government Board, and means are to be taken for their publicity.

Legal Proceedings.

All offences, penalties, costs and expenses under the Act or by-laws are to be prosecuted and recovered under the Summary Jurisdiction Acts. County courts having jurisdiction may settle time and manner of doing any work, and any person shall have the same right of appeal from a decision as he would have in any other matter. At least one-half the penalties recovered shall be paid to the Council. Council may demolish buildings, sell materials and recover expenses, and the powers conferred may be exercised by the local authority in like manner.

The most important creation of the Act will be the Tribunal of Appeal. It is to consist of three members, one of whom is to be appointed by a Secretary of State, one by the Council of the Royal Institute of British Architects, and one by the Council of the Surveyors' Institution. No member or officer of the Council is eligible for membership. The appointment is for five years, but a member can be reappointed. The Lord Chancellor can remove a member for inability, misbehaviour or other sufficient cause. Whenever a vacancy occurs the nomination of a successor lies with the Secretary or Society that appointed the former member. The remuneration of members is to be by salary or fees, or partly one and the other, as a Secretary of State may fix from time to time. The Tribunal can appoint clerks, officers and servants, provide offices and obtain such professional advice and assistance as may be found necessary. The Council may defray the expenses of supporting any of their decisions or those of their superintending architect, engineer, or a district surveyor before the Tribunal. If ordered by the High Court or a Judge the Tribunal shall state a case for the opinion of the High Court on any question of law in any appeal submitted to them. The High Court can reverse, affirm, or amend the determination, or make such other order as the circumstances of the case require. The Tribunal will have power to hear counsel, solicitors or agents, as well as the parties interested in a case, to administer oaths, to hear and receive evidence, to require the production of any documents and books, and to confirm or reverse or vary any decision and make such order as they may think fit, and the costs of any of the parties to the appeal, including the Council, shall be in the discretion of the Tribunal. Subject to the approval of the Lord Chancellor, the Tribunal may from time to time make regulations as to the procedure to be followed

in cases of appeal to the Tribunal, including the time and notice of and the fees. Any order of the Tribunal may be enforced by the High Court as if it had been an order of that Court. All fees and sums of money paid to the Tribunal shall be paid over to the Council, and all expenses of the Tribunal and the Council in reference thereto shall be defrayed out of the county fund.

Miscellaneous.

The sixteenth part comprises a great many subjects, such as expenses, power to annex conditions in giving sanction, plans and documents, storing of wood and timber, preventing obstructions, &c. One of the clauses says that in the event of its being necessary to take down any portion of an old building of architectural or historical interest constructed otherwise than in accordance with the regulations of the Act, or in the event of the destruction of any part of such building, the part so taken down or destroyed may, with the consent of the Council, be restored in the same material and in the same design as it formerly was.

There is also a recapitulation of the offences against the Act, including anything done in or about a building contrary to the provisions by a workman, labourer, servant or other person employed.

There is, too, a statement about the buildings and structures which shall be exempt from the operations of the Act. Some causes of annoyance will be removed by the including among them of greenhouses which are not attached to other buildings, attached greenhouses so far as regards woodwork of sashes, doors and frames, metal and glass cases for holding plants fastened to the woodwork of the sill and lower sash of a window, openings made into walls or flues for ventilating valves which do not exceed 40 square inches in area and are not nearer than 12 inches to any timber or combustible material.

Finally, there is a statement of the Acts, enactments, by-laws, &c., which are repealed.

URICONIUM.

AFTER an interval of many years, Mr. Kenward, F.S.A., of Birmingham, has revisited the site of the Romano-British city of Uriconium, at Wroxeter, Salop. He says he was very sorry to find that little or nothing has been done during the past twenty or twenty-five years to uncover the buried walls, or even of the small uncovered portion to protect against the modern what had been left by the old barbarians. The place, indeed, remains practically unknown. An occasional inspection by a wandering antiquary or a frolic among its ruins by an excursionist party seems to represent public interest with regard to it. And yet Uriconium or Virioconum as in the earlier and more correct form (Vrecon = Wrekin) is a place of exceeding interest. Whether we consider it as founded in the second or third century, or as pillaged and burnt by the Picts in the fifth, or by the Saxons in the sixth century, it is a landmark in our history not surely to be neglected. On the bank of the Severn, on the line of Watling Street, separated by only one station (Bovium) from the seat of the twentieth legion, Deva Colonia, Uriconium held a very strong and important position in the Midland Province. It was no mean city. The walls have been traced in a circuit of at least three miles. It is known that the remains of numerous buildings lie within their area. Throughout the last century and in the earlier part of the present desultory researches were occasionally made around the old wall, which has stood above ground, a massive fragment, for 1,500 years. But it was only in 1859 that a serious and systematic exploration was begun, under the direction of the late Mr. Thomas Wright and with the concurrence of the Duke of Cleveland. The basilica was then discovered and a portion of the public baths. The extramural cemetery was traced. Human bones, pottery in various styles, coins and implements were unearthed in abundance. Mr. Wright's valuable book and the Shrewsbury Museum contain ample records of these excavations and of the results. But the exploring committee could not struggle long against the interests of the owner and the tenants of the land. Rome must of course yield to mutton and turnips, and the greater part of the small uncovered area had to be restored to its agricultural level. Since the period named the work of exploration has been almost wholly neglected, and the preservation of what has been excavated is of so imperfect a sort that it may be some day said, as Mr. Chancellor Lowe remarked when asked to contribute to the researches on the site of Troy, "Is there any such place? 'Etiam periere ruinae.'" Dr. Schliemann has given a sufficient answer to that question in the case of Troy.

It is hopeless to approach the Government for pecuniary aid. Lord Sherbrooke on the occasion referred to objected to the use of "poor taxpayers' money" for such a purpose, unless, indeed, there were found treasures under the earth which Great Britain could share in. Uriconium certainly has no treasures of the kind intended by the Chancellor, but it has others which other men know how to value. The nations of the Continent have a far higher appreciation of the past. Italy, for instance, has laid open Pompeii and the Palatine Hill at Rome with the greatest assiduity and goodwill, and who can deny that history has been elucidated and education promoted by the abundant results?

It is to private aid, however, that we must as usual look, and the example of Silchester (Calleva) is a shining one. Thanks to the cordial liberality of the Duke of Wellington and to the unwearied exertions of the Society of Antiquaries, we are gradually acquiring a full knowledge of the structure and conditions of that first-class Romano-British station. And it is not doubtful that our descendants will know much more of it than we do. But how will it be with Uriconium?

A ROMAN VILLA NEAR CARDIFF.

THERE have lately been discovered near Cardiff on the Ely racecourse the remains of a large Roman villa. The find was made by Mr. John Storrie, late curator of the Cardiff Museum, who has now been engaged for the past two months in conducting preliminary excavations on behalf of the Cardiff Naturalists' Society, they having taken in hand the work of exploration. The results so far obtained are most satisfactory, proof having been found of the existence of prehistoric dwellings, upon the foundations of which a large and important Roman villa was erected. It also appears highly probable that, this having fallen into decay, a smaller Roman villa was built upon its foundations. The remains of the walls at present discovered are of great thickness and solidity. Among other articles met with are flint arrow-heads, large quantities of tesserae, fragments of Samian ware and black pottery, a considerable quantity of coloured and figured wall-plaster, Roman coins of various dates, fibulae and broken glass. At present the work has only been commenced, but the committee are most anxious that the site shall be thoroughly worked. The cost of this will amount to several hundreds of pounds. Nearly 100*l.* has been raised by subscriptions, but it is feared that the whole amount required cannot be raised locally. The Vicar of Cardiff accordingly appeals for aid to those who take an interest in archæological research.

LUCCA CATHEDRAL.

A COMMITTEE has been formed at Lucca for the restoration of the cathedral of that city. It is alleged that the tower and west front are not only in a dilapidated condition, but are positively dangerous, and that the cornices of the aisles are rotten from the percolation of water. The necessary works for the repair and restoration of the building will be put in hand so soon as the requisite funds are obtained, and it is also proposed to remove the houses built against the walls. It appears that there are no caputular funds available for the restoration of the cathedral, and an appeal is made for subscriptions, not only from Italy but from the lovers of art in all countries.

The cathedral was founded in 1060, and was consecrated in 1070 by Anselmo Badagio, who, having filled the episcopal chair of Lucca, became supreme pontiff under the name of Alexander II. (1061-73). It was this pope who presented the consecrated banner to William of Normandy when about to invade England. Most of the original features of the cathedral have been obliterated by subsequent additions. The west front was erected by the architect and sculptor Giudetto in 1204. Mr. Ruskin, in the "Seven Lamps," remarks, "The rich inlaid work of the front of this church and St. Michele are altogether unique. Both represent hunting pieces—lions, wild boars, wolves, foxes and deer pursued by hounds and men, with lance and horn, constantly repeated." St. Michele has been entirely ruined by restoration, and it is probable that a similar visitation will overtake the cathedral.

A Dinner of unique character was given on Saturday night (29th ult.) to a company numbering upwards of 600 in the palatial new annexe of the Holborn Restaurant. The guests consisted of all the artificers and workmen employed in the construction of this adjunct, of which Mr. T. E. Colcutt is the architect, the proprietors considering the men should be the first to banquet within its principal salon, the "King's Hall."

TESSERÆ.**Trimming Joists.**

THE efficiency of single flooring is materially affected by the necessity which constantly occurs in practice of trimming round fireplaces and flues and across vacuities. Trimming is a mode of supporting the end of a joist by tenoning it into a piece of timber crossing it, and called a trimmer, instead of running it on or into the wall which supports the ends of the other joists generally. A trimmer requires for the most part to be carried or supported at one or both of its ends by some of the joists, which are called trimming joists, and are necessarily made stouter than if they had to bear no more than their own share of the stress. Commonly it is found enough to make the trimmers and trimming joists from half an inch to an inch thicker than common joists. In trimming tusk tenons should be used, and the long tongue or main body of the tenon should run not less than 2 inches through, and be draw-pinned and wedged, moreover, if it do not completely fill the mortise in the direction of the length of the latter. The principal objection, however, to single flooring is, that sound readily passes through, the attachment of the boards above and of the ceiling below being to the same joists throughout. Another objection is the necessity of making the joists so thin, not to injure the ceilings, that they with difficulty receive the flooring brads in their upper edges without splitting. A partial remedy for both these disadvantages is found in a mode sometimes adopted of making every third or fourth joist an inch or an inch and a half deeper than the intervening joists, and to these ceiling joists are notched and nailed, or nailed alone. This, by diminishing the number of points of contact between the upper and lower surface, for the ceiling joists must be carefully kept from touching the shallower joists of the floor, is less apt to convey sound from one storey to another, and allows conveniently thin joists to be used for the ceiling without affecting those of the floor. It clearly, however, involves the necessity of cogging the deeper joists down, so much more on the wall-plates on which their ends rest.

Soane as an Architect.

Notwithstanding Sir John Soane's undeniable attachment to his profession and his industrious application to it, the majority of the buildings that he executed are little better than so many experimental attempts at originality, with considerable merit in parts but more or less failures upon the whole. With all his apparent fertility of invention they exhibit sameness of ideas, and those by no means of the happiest kind, while, with a good deal of study in some respects, they betray great neglect of it in others. Never was architect more unequal in his taste, not only at different times but in the same building, for not a single building among all that he executed or designed is consistently finished up throughout. On the contrary, striking beauties and striking defects are so oddly mixed up in several of them, that it is hardly possible to say which predominate. Even in mere designs, where he was at liberty to exercise his fancy without restraint, there invariably occurs something most offensively mean or extravagantly uncouth and absurd. Proofs of this assertion are furnished by the folio of "Public and Private Buildings," published by him in 1828, and which was intended to be in some measure a record of his long professional career, although the plates are wretchedly executed; and nearly the same may be said of those in the "Description" of his own house and museum—a quarto volume of some bulk printed by him in 1832 for private distribution and presents. In both instances he was most niggardly towards himself, yet in the latter not altogether free at the same time from vanity. The same may be said with regard to his house itself, the exterior of which is by no means such a specimen of taste as an architect would be ambitious of bequeathing to posterity, though taken altogether the building and its contents form a monument sufficiently expressive of the character of the man—a strange jumble of insignificance and ostentation, of parsimony and extravagance, of ingenious contrivance in some parts and of the most miserable conceits in others. Such as it is, however, it was for years his favourite amusement, even from the time when he commenced it in 1812; and as he seems to have grudged no cost in making repeated alterations, it is singular, more especially considering the purpose to which he ultimately destined it, that he should not have rebuilt the front and that of the house on each side of it (also his own property), so as to have produced a uniform façade of tolerably imposing aspect, even had he not added those houses to his own residence and museum. As an architect he did not, with the exception of the Bank—and there only in bits—accomplish anything of sterling merit. He had great ingenuity and contrivance, and was often singularly happy in those picturesque and perspective effects which depend upon arrangement and plan and on the mode of admitting light in interiors, but he never fully wrought up his ideas and often left them quite crude sketchings. His attempts at Gothic were almost beneath contempt. On the other hand, he is entitled to no small praise as being, if not the inventor of a new order, the first to apply and

naturalise in this country the Tivoli Corinthian, employed by him at the Bank, the north-west corner of which structure so infinitely surpasses anything that he ever executed or designed, that his reputation would stand higher if that were all that he ever did.

The Carpenters' Company's Frescoes.

The Carpenters' Company possess four mural paintings in distemper, and divided from each other by representations of ornamental pilasters. They are accompanied by mutilated inscriptions in English indicating the subjects, which are all Scriptural:—(1) Noah receiving the command to build the Ark, and the Ark being built. The inscription is from Genesis v. 13. (2) Josiah commanding the Temple to be restored, from II. Kings xxii. 3-7. The inscription is, "Kinge Josyas comandyd y^e h^e prest y^e m^oney w^h was . . . hous of y^e lord should be delyvered to y^e Carpynters w^out any . . ." On one side the king is giving his commands, on the other the carpenters are receiving the money. (3) Christ assisting his father in the carpenter's yard, from St. Luke ii. 42. The inscription is "Christ at y^e age of XII. yer^s syttinge amonge the teachers in the temple; his father and his mother come to seke hym; he went wyth them to Nazareth and was obedyent unto them. Lueke, ii. chapter." (4) Mutilated, about half the painting being destroyed, Christ teaching in the Synagogue, from St. Matthew xiii. 54, 55. The inscription is, "Chryst teachynge in y^e synag . . . wysdom is thys, is not thys that carpynters . . ." The paintings were accidentally discovered in the year 1845 by a workman during some repairs to the hall. Under the distemper is a layer of lime spread on the plaster. No certain evidence of the date of the execution of these paintings is to be found; there is, however, proof that they were in existence as far back as 1596. Among the Cottonian MSS., Julius, c. III. f. 272, is a letter from Thomas Nash, the Latinist and dramatist, to Mr. William Cotton, containing a distinct reference to the third of the series. The letter is without date, but Mr. Payne Collier, who published it in his "Annals of the Stage," vol. i. p. 302, judges from its contents that it was written about 1596. The passage is as follows:—"And for the printers, there is such gaping amongst them for the copy of my L. of Essex voyage, and the ballet of the threscore and foure knights, that though my Lord Marquesse wrote a second parte of his feverburden or idlenesse, or Churchyard enlarg'd his Chips, saying they were the very same which Christ in Carpenters' Hall is paynted gathering up, as Joseph, his father, stands hewing a peice of timber, and Mary, his mother, sits spinning by, yet wold not they give for them the price of a proclamation out of date, or, which is the contemptiblest summe that may be (worse than a scute or a dandiprat) the price of all Harvey's works bound up together." There can be little doubt that the paintings were executed several years before the date of this letter, probably in 1561. Extensive repairs took place in the hall in that year, including the repair of the western wall where the paintings are. If the paintings had been there previously they would have been destroyed or interfered with by the work then going on, and the Company's books contains allusions to works then executed. For instance, the painting of the "Skrenes" is mentioned and a "Storie" over the "Skrenes." The year 1561 was evidently a memorable one in the annals of the Company, for the four well-known crowns or garlands bear date in that year. There appears to be little doubt as to the reason for the careful concealment of the paintings. They in all probability never saw the light from the days of Cromwell till the year 1845, and had they been discovered they would doubtless have been condemned as superstitious and destroyed.

Wren and his Fees.

The enemies of Wren on the commission for the erection of St. Paul's having procured a clause to be inserted in an Act of Parliament, suspending a moiety of his pittance (200*l.* a year) till the building was finished, he was kept out of his money long after it was due under the pretence that the building was not complete, whereas the cavillers themselves by their impediments alone hindered its completion. He was in consequence obliged to petition Queen Anne, and in his memorial he states that the arbitrary proceedings of some of the commissioners had alone obstructed his measures for the completion of the work. This was handed over to the commissioners themselves for their answer, who replied by mean and paltry excuses. Wren, however, was not to be borne down by a low cabal: he next addressed the Archbishop of Canterbury and the Bishop of London, and the document itself affords ample testimony of the treatment he had received. "The design of the Parliament (he states) in granting the coal duty for the said cathedral, being to have the building completed with all possible speed, they did, to encourage and oblige the surveyor's diligence in carrying on the work, suspend half his allowance till all should be done. Whereby, I humbly conceive it may justly from thence be implied, that they thought the building and everything belonging to it was wholly under my management

and direction, and that it was in my power to hasten or protract it. How far it has been so your lordships know; as also how far I have been limited and restrained. However, it has pleased God so to bless my sincere endeavours, as that I have brought the building to a conclusion so far as is in my power, and I think nothing can be said now to remain imperfect but the iron fence round the church and painting the cupola, the directing of which is taken out of my hands, and therefore I hope that I am neither answerable for them, nor that the said suspending clause can or ought to affect me any further on that account. As for painting the cupola, your lordships know it has been long under consideration; that I have no power left me concerning it, and that it is not resolved in what manner to do it or whether at all. And as for the iron fence, it is so remarkable and fresh in memory by whose influence and importunity it was wrested from me, and the doing it carried in a way that I may venture to say will ever be condemned. I have just this to observe further, that your lordships had no hand in it and consequently ought not to share in the blame that may attend it. This then being the case, and nothing left that I think can keep the same clause of suspension any longer in force against me, I most humbly pray your lordships to grant your warrant for paying me what is due to me on that article, which was 1,300*l.* last Michaelmas. And if for the future my advice and assistance be required in any thing about the said cathedral, I will be ready to give the same and to leave the consideration of it to your lordships." This representation not succeeding, he applied at once to Parliament, who rendered him that tardy justice, the long denial of which reflects so much disgrace on those who opposed his just claims. "Whereupon that honourable and august assembly," says Sir Christopher, "so considered his case and were so well satisfied with the justice and the reasonableness of it, as to declare the church to be finished so far as was required to be done and performed by him as surveyor-general. And it was accordingly enacted that the suspended salary should be paid him on or before December 25, 1711, which he has the truest sense of and has not, he hopes, been wanting in all due acknowledgments and returns for it. Neither is it possible that he or his posterity should ever forget so signal and distinguishing a favour, while he can remember the unjust and vile treatment he had from some in the late commission for St. Paul's, which was such as gave him reason enough to think that they intended him none of the suspended salary if it had been left in their power to defeat him of it." By the death of Anne, Wren lost the last of his royal patrons; in the new reign, the king's partiality for his German subjects and their connections deprived him of the sunshine of royal favour. His talents, his uprightness and his fame were all forgotten; the corruption of that period in the disposal of patronage is well known. At last, after a severe struggle, in the eighty-sixth year of his age and the forty-ninth of his office as surveyor-general, he was deprived of his patent in favour of one Benson, his German influence prevailing over one who would not condescend to truckle even to a court and whose life, as Walpole observes, having enriched the reign of several princes, disgraced the last of them.

Roman Temples.

As in Greece, so also in Rome, the noblest specimens of columnar architecture are in the temples of the divinity, but it does not appear that the Romans were in the habit of constructing them peripterally, as the Greeks so constantly did. There are indeed ruins which induce the belief that they at times built dipteral temples, but their common practice (as far as existing examples are authorities) was to make them pseudo-peripteral or apteral and prostylar; of an amphiprostyle even we have not an example. It certainly is the custom to restore the ruined temples, whose remains are a few columns only, as if they had been peripteral, but it is done not only without sufficient authority but against that which the more perfect structures present. The great projection, too, that the Romans gave their porticoes is evidence that they were dependent entirely on themselves for effect, for they are generally projected three columns and their interspaces before the cella, which, however, has no pronaos with columns in antis, nor does it appear from existing remains that the Romans were accustomed to use that arrangement. Circular or peristylar temples are not uncommon in Roman architecture, and there are temples to which it can hardly be supposed that columns were ever attached; these are for the most part polygonal. Neither do the Romans appear ever to have constructed hypæthral temples with columns internally, as the Greeks did. Indeed it is a question whether all their temples were not cleithral, for it is not generally admitted that the Pantheon, which is hypæthral by the open eye of the dome, was originally a temple, and where the structures remain tolerably perfect, the ceilings and roofs appear to have been formed by arching from flank to flank, and thereby quite enclosing them. The application of columns internally is most strikingly effective in the Pantheon, where they are

arranged in front of niches or deep recesses, composed with antæ to carry a crowning entablature round under an attic on which the cupola rests. No representation can convey even the most incompetent idea of the effect of this arrangement to those who cannot gather it from the plan. A section presents only one compartment correctly; all the rest must of necessity be foreshortened. It is far otherwise with the Temple of Peace and the hall of the Baths of Diocletian, in which columns stand before the piers to have the entablature broken over them. This, indeed, was the result, as is sometimes explained, of the combination of columns with arches, and it is most clearly exemplified in those works which most probably originated the practice, and which are next in pretence to the temples—these are the triumphal arches. The Romans had not adopted the simple graduated stylobate of Greek columnar architecture in their temples, but made the access to their porticoes in front with thin steps, and built vertical stereobates along the flanks for the walls of the cella, or as stylobates, if there were attached columns. In applying a columnar arrangement to the triumphal arch this lofty stylobate was taken also. The breadth of the opening prevented the columns from being placed equidistant; they were therefore coupled, the entablature was broken over them, and necessarily the stylobate was cut through, leaving mere attached pedestals to stilt the columns, so that the whole ordinance was deprived of everything that could render it as a composition beautiful; its simplicity and harmony were entirely gone, and instead of giving a graceful character to the structure it became a mere attached frontispiece that could only deform it. As if conscious that the Corinthian was too beautiful to maltreat in such a manner, the Roman architects produced the hybrid, which has since been called the Composite order, to use in these compositions; in them, indeed, it is chiefly found, and if it were not evidently a mere deterioration of the Corinthian it might with truth and propriety be called the Roman order.

Classification of Imposts.

The mode in which an arch is connected with or made to spring from a shaft or column affords Professor Willis another means of classifying buildings. As there is usually an impost intervening between the arch and the shaft this may be either corbelled, continuous, discontinuous, banded or shafted. A corbelled impost is an arrangement in which the arch mouldings are supported on a corbel or bracket projecting from a wall or pier, so that in fact there is no shaft; a continuous impost is where one of the mouldings of the arch is a continuation of the shaft itself, so that there is in strictness no impost at all; a discontinuous impost is where there is no actual impost, but the moulding of the arch is different from the shaft which supports it, and the two mutually die away into each other; a banded impost is where the moulding of the arch is the same form as the shafts, and the impost appears to go round their point of junction like a band; the shafted impost is more like the original Roman form, the shaft being of a different pattern from the arch moulding, and the impost appearing effectually to separate the two. Taking these as the varieties, Professor Willis has shown that the shafted and the continuous were used in the Roman and some of the Romanesque styles; that the banded was used very slightly in the German Pointed and in the German Romanesque, in the doorways in the Lombard style, and almost universally in Italian Pointed; that the discontinuous is unknown in Italy, and only practised north of the Alps; and that many varieties of these were comprised in the richest Pointed structures.

Horizontal Repetitions.

In the Italian style the injudiciousness of putting order above order is manifest, because of the impossibility of maintaining a rational arrangement with regard to diminution and intercolumniation. The practice is, moreover, objectionable, because of the repetition of the similar parallel lines of the entablatures, similarly projected too, which destroy the breadth a composition should possess; and because the upper and crowning cornice, if in proportion to its own ordinance, must be disproportioned to the whole elevation, which takes from that member a character of grandeur or meanness, as it may or may not be fitted to its whole height. This is made very evident by the opposed fronts of the United Service and Athenæum Club-houses in Pall Mall, the former of which is finished by the thin, shelf-like cornice of a second order, and the latter by a bold massive crowning cornice in the style of that of the Farnese Palace. In a similar manner, and for the same reason, the practice of raising lofty basements to support columnar ordinances is injudicious; and this detracts much from the merit of the front of Somerset House, by making the crowning cornice of less importance than it should be. In St. Paul's this fault is partially relieved by the somewhat exaggerated size of the cornice of the upper order, and by the insertion of cut blocks, in the manner of upright modillions, under it the whole depth of the frieze.

NOTES AND COMMENTS.

A MEETING of the East Sussex County Council was held in Lewes on Tuesday. The visiting committee of the Haywards Heath Lunatic Asylum presented a report pointing out that, though there is nominally accommodation for 877 patients, several of the wards are overcrowded, and the number of beds in such wards ought to be reduced. The average annual increase of patients from East Sussex and Brighton is about twenty, and at this rate of increase the surplus beds will be filled with patients from East Sussex and Brighton in about four and a half years, or, if the reduction in beds is carried out, in from two to two and a half. The committee therefore asked the Council to authorise them to have plans and estimates prepared for buildings for the accommodation of a further number of patients, providing for (1) a hospital for the treatment of acute cases; (2) additional accommodation for pauper patients; (3) special accommodation for idiots and imbeciles; (4) accommodation for private patients. The proposal gave rise to a long discussion. It was considered by some of the councillors that the present was not a favourable time to set about works which would cost 42,000*l.* Eventually it was decided that the proposal should be considered by eight members of the visiting committee and eight members from the rest of the Council.

THE connection between the smoke from house fires and fogs which Dr. RUSSELL had established by undisputed experiments in London has been traced with similar exactitude in Liverpool. An account of the investigations prepared by Mr. T. L. BAILEY, Ph.D., and Mr. C. A. KOHN was submitted to the Sanitary Congress on Friday last. They found that the truly abnormal constituents of the Liverpool atmosphere might be classed under the following heads:—(1) Gaseous impurities, such as sulphur dioxide, hydrochloric acid, ammonia, organic compounds, and in some cases considerable excess of carbon dioxide; (2) solid impurities, such as dust, mineral salts, &c., and organised matter; and (3) liquid impurities, consisting of sulphuric acid, hydro-carbons, and organic bases. Of special importance were the sulphur dioxide, the organic compounds, dust, and organised matter, consisting of moulds and germs. Of the two former, the origin was undoubtedly the combustion of fuel, mainly in dwelling-houses. In the wake of these polluting materials followed fog, for it was known certainly that solid particles formed collecting surfaces for the deposition of atmospheric moisture. The method employed for the purpose of collecting evidence consisted in the establishment of stations for investigation in various parts of Liverpool, analysis being made simultaneously at each station. From results obtained at the two stations—the one at University College and the other in Vauxhall Road, where the experiments had been carried out by Dr. G. SCHACK-SOMMER and Mr. S. STEIN—it was shown that in the more thickly-populated parts of Liverpool the sulphur oxides existed in quite three times the amount found at University College, and, furthermore, that during clear weather there was a comparative freedom from sulphur oxides as compared with what was found during foggy weather. In regard to Liverpool itself, however, as compared with Manchester and London, the results were fairly low, and the decrease of noxious material which took place in Manchester and London during the summer months was more marked in Liverpool. The work done up to the present time shows the necessity of further investigating a question of such importance, and with that object in view it is proposed to establish several stations in addition to the two at present existing. It may be granted, however, without further investigation, that smoke is effective in producing fogs. The question then remains where is the remedy to be found? The chemists apparently can only suggest the abandonment of bituminous coal and the substitution for it of either gas or anthracite. Neither remedy is of the kind which appeals at once to lovers of a cheerful fireside. Far more compatibility would be found in improved fire-places. Several exist which, if used, would do much towards diminishing the quantity of sulphur dioxide and other dangerous elements, but as long

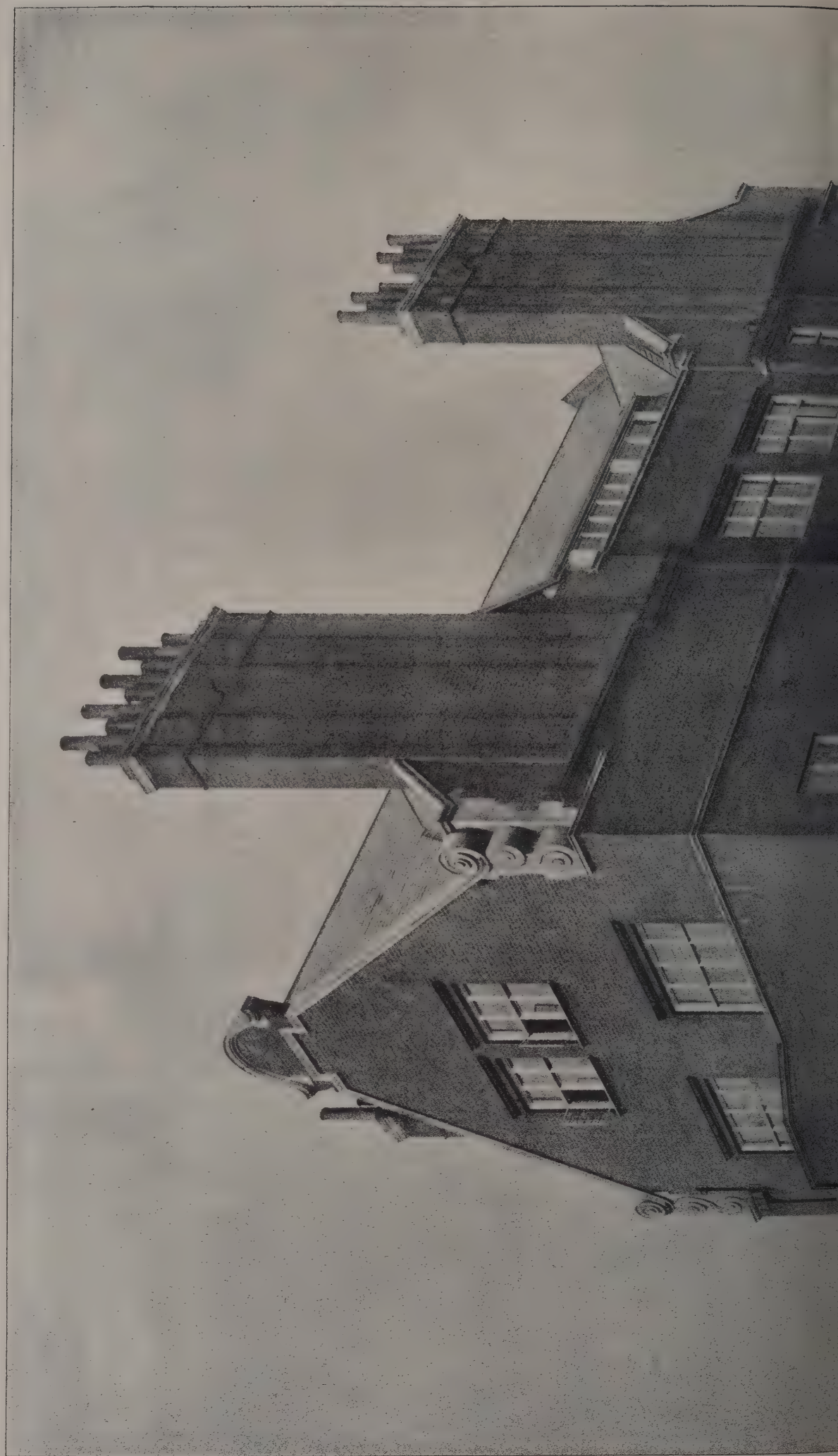
as commonplace and antiquated grates are used because they are cheap, we must put up with dense fogs.

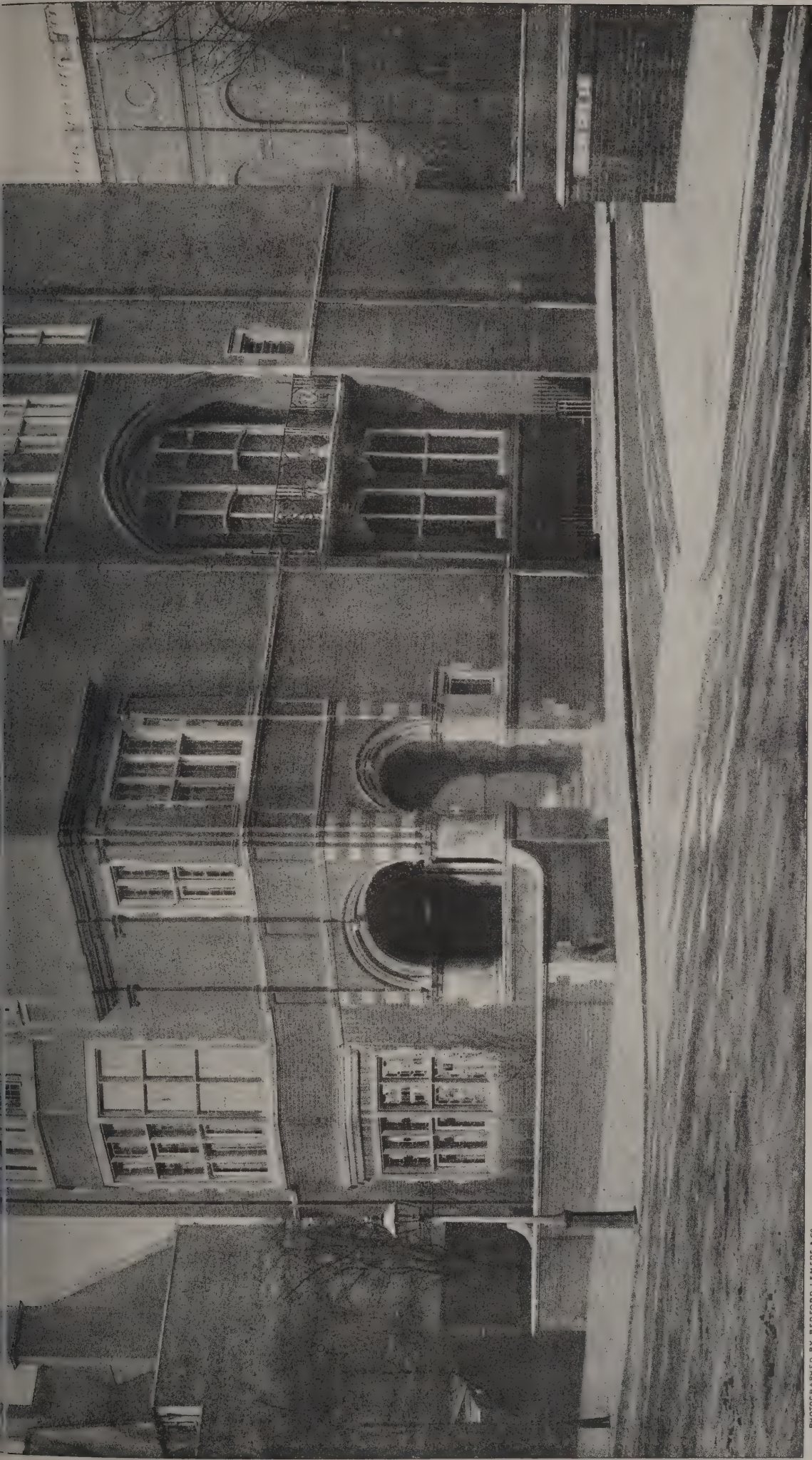
THAT the old Egyptians believed in the virtues of permanent colours is evident from the inscription set up on one of the works of the pyramid builders, NEH FERMAD, which announces that colour decoration for a temple should be as eternal as the gods. In spite of time and weather, war and tourists, the walls still reveal with what care the colours were produced and laid on. Some efforts have recently been made in Germany to discover the secret of so much endurance. In the first place, it was ascertained that, with few exceptions, the colours were derived from mineral substances. The colour that was accepted as most fitting in mural decoration was a brownish-red, originally was not unlike the so-called Pompeian red. It was made out of an oxide of iron tempered with earth. As under the microscope the stuff appears to be remarkably fine in grain and uniform it is concluded that much patient labour was devoted to the grinding and washing of the materials. Oxide of iron was also used for the yellows and mixed with alumina, lime, &c., to obtain a variety of shades. Powder bronze and gold leaf may also have been utilised. The blue was derived from melted glass with a salt of copper, which it is supposed was allowed to flow into cold water in order that from the brittleness obtained in that way it could be more easily pulverised afterwards. Gums were used to make the stuff adhere to the ground when laid on. Gypsum was used for white, and when mixed with red, and it may be some other colour, formed a sort of pink. Some enquirers suppose that the red was a vegetable substance. The conclusions correspond to some extent with those of JAHN, which were announced half a century ago. According to his analyses the blues appeared to be oxides of copper, with a small intermixture of iron; in none of them was cobalt. The reds were red oxide of iron mixed with lime. The yellows were taken to be vegetable colours, the greens were mixtures of the vegetable yellow and copper blue, and the blacks were made out of pitch, charcoal, or soot.

THE style adopted for the Hôtel de Ville, Paris, is not supposed to be out of keeping with stained-glass windows. In them, as on the walls, the French painters will be afforded many opportunities to display their art in its earliest developments. Two windows designed by M. BESNARD were set up a few days ago in the buvette of the Municipal Council. The subject of one is the old fruit market, which is held on the bank of the river not far from the Hôtel de Ville. The scene allows of the richest colours without any loss of modernity. The subject of the other is no less happy. It represents the evening of a fête, and a few boys are seen on the trees fastening coloured lanterns. For his cartoons M. BESNARD received 120*l.*, and a similar sum was paid for reproducing them on glass. The walls of the buvette will be painted by M. FORAIN, whose illustrations in black and white are familiar.

THE coming winter will be, according to the correspondent of the *Times*, one of great activity and interest in Athenian archæological circles. Professor DÖRPFELD hopes to resume shortly his excavations between Mars Hill and the Pnyx, where last spring he discovered the great aqueduct (of PISISTRATUS?) and what he believes to be the long-lost Enneakrounos. These discoveries have given a new impulse to the long-cherished plan of excavating the entire north slope of the Acropolis; and the Greek Government has declared the whole of that region, from the Theseion to the Monument of LYSICRATES, "archæological ground," thereby forcing the proprietors to sell at prices to be settled by a mixed commission of sworn experts. This region is the well-known old quarter of modern Athens, consisting of little one-storey houses of two to five rooms. The cost of expropriation will probably amount to several million drachmæ, but the American and German Schools and the Archæological Society of Athens can easily cover the expenses between them. When this space is laid bare the greater part of ancient Athens will no doubt be brought to light.

The Architect, Oct: 5th 1894.





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INK- PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET FETTER LANE, E.C.

180 QUEEN'S GATE, KENSINGTON.

R. N. SHAW, R.A., Architect.





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1794 PHOTO SPRACUE & CO 4 & 5 EAST HARDING STREET FETTER LANE EC

179 QUEEN'S GATE, KENSINGTON.
W. EMERSON, Architect.

The Architect, Oct. 5th 1894.





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190 AND 191 QUEEN'S GATE, KENSINGTON.
F. G. KNIGHT, Architect.

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ILLUSTRATIONS.

180 QUEEN'S GATE, KENSINGTON.

179 QUEEN'S GATE, KENSINGTON.

190 AND 191 QUEEN'S GATE, KENSINGTON.

OLD LONDON.

GRADUALLY but surely the landmarks of Old London are being swept away. The latest instance of this is seen in the demolition of Doctors' Commons, including the Vicar-General's Office and the Faculty Office, where, up to 1874, marriage licenses were granted. Here, in seeming irony, formerly stood the Probate and Divorce Courts and the Court of Arches. The well-known low archway in St. Paul's Churchyard will be greatly missed by the busy thousands who pass it every day. The touts for licenses, "two coves in vite aprons," as Mr. Samuel



Weller said, have disappeared, and ere long a huge warehouse will cover the ground. Doctors' Commons takes its name from the fact that the doctors of civil law formerly used the old buildings for study and practice, and communed or dined together in the hall. Of course the disappearance of such historical and interesting old buildings cannot but be regretted. We cannot but hope that the buildings about to take their place will be worthy of the site and proximity to our great metropolitan cathedral.

Mr. L. S. Marks, B.Sc., a student of Mason College, Birmingham, and an Associate of the college, has been appointed to organise and take charge of the mechanical engineering laboratory at Harvard University, United States, and to lecture on the steam-engine, thermo-dynamics, and ventilation and heating of buildings.

WATTON PRIORY.

ON the second day of the excursion of the members of the East Riding Antiquarian Society the first halt was called at Kirkburn, where the church, which is a fine example of late Norman work, was described by Mr. Bilson, of Hessle. The font, with its rich sculptures, excited much interest and discussion. The party then returned to the carriages, and another short drive conveyed them to the interesting church of Bainton. This fabric is chiefly of the later Decorated style, and the windows have reticulated tracery. It contains the exceptionally fine monument of Edmund de Mauley, who died in 1314. Mr. Bilson again proved himself to be a lucid guide and thorough ecclesiologist. Some discussion arose, which was taken part in by Messrs. Stanbridge, Leach, Hope and Cox. The members were most kindly entertained to luncheon at Bainton School by the Rev. J. W. Stanbridge, B.D., rector of Bainton. After luncheon several new members were elected, making a total addition of thirty-five during their meeting.

The carriages were then resumed for the longer drive to Watton. Upon reaching Watton Priory (which is generally in error styled Abbey) about three o'clock the visitors found that one portion of the old buildings was still standing, and occupied as a residentiary dwelling of some size by Mr. Beckett. It is a picturesque block to the east of the old conventual church and cloisters, and was probably the prior's lodging and guest-house, with part of the infirmary attached. It is of various dates, from thirteenth century to repairs and additions of the present day, but its chief feature is one of exceptional beauty and grace, namely, a fine two-storeyed oriel of fifteenth-century date. Last year the Society unearthed the ground plan of the conventual church, which was 208 feet long by 51 feet wide, and found that it was divided from end to end by a partition wall, which separated the nuns from the canons, Watton Priory being one of the three houses of the English Gilbertine Order, which remained "double"—that is, for both sexes—down to the period of the dissolution. The president (the Rev. Dr. Cox) said a few introductory words about the order and Watton. He stated that the remarkable Gilbertine Order, the only religious rule founded by an Englishman, was started by St. Gilbert of Sempringham in 1148. Two years later—namely, in 1150—Watton Priory was founded by Eustace Fitzjohn on the site of an old and long-disused Anglo-Saxon religious house. The original Norman church and cloisters were burnt in 1167. Watton was the largest and most wealthy of the comparatively few Gilbertine houses, which were only 25 in number, including several cells. The Watton inmates were limited to 140 nuns or sisters, and to 70 canons and lay brothers. At the time of the dissolution Watton was valued at about 7,000*l.* a year of our money. He pointed out a variety of peculiarities in the statutes of the order, which illustrated what they had found and what they might expect to find in the buildings. He regretted that owing to harvest labour they had only been able to give one whole week to this year's diggings, and, though much of interest had been revealed, the difficulty with regard to the housing of the canons and their cloister had not yet been solved, though it had been reduced to narrow limits. It was hoped that a shorter investigation next year might clear up the puzzle, so far, at all events, as it was capable of being elucidated.

Mr. St. John Hope, the secretary of the Society of Antiquaries, who has been in charge of the excavations both of 1893 and 1894, then proceeded to explain what had been accomplished this year, and how far the mapping out of the ground-plan had been carried. They had completed the excavation of the church by uncovering the walls of the south chapel, about 30 feet long, which was entered by an archway from the south side of the nave. In this chapel the altar had been found stripped of its covering slab, but still fairly perfect, whilst the original tiles of the altar-face were yet in position. The unusually large chapter-house on the east side of the cloister had been chosen as the site of a small kiln erected there for the purpose of obtaining lime from the old chalk-walls by the first set of demolishers; but still a good deal of the chapter-house area was not much damaged, and the side benches and the raised platform at the east end and patches of ornamental floor-tiles had been found. The outer walls and central pillars of the ground-plan of a groined undercroft that ran beneath the great dormer or dormitory had also been found on the same side of the cloister. On the north side the vaulted rooms beneath the frater or refectory had been uncovered, as well as the cellarers' block to the west. The kitchen, with hearth and ovens, was found at the north-west angle of the cloisters. A variety of outlying buildings and enclosing walls had also been tested. The smaller finds included many good varieties of early pattern tiles, a great variety of Mediaeval broken pottery, some of much interest, beautifully-designed lead ventilators for windows, fragments of glass, keys, a small pair of shears, a colour-palette formed of a thin tablet of marble, &c., which were carefully inspected by the visitors. The moulded stones of different dates that had been uncovered were

arranged according to their periods, and clearly labelled for the advantage of visitors. These will shortly be moved to the vestry of the parish church, where most of those of last year are already placed.

A short visit was also paid to the closely adjacent parish church. It is built of Mediæval brick with stone facings. Dr. Cox briefly described it. In the chancel are two Early English windows in the north wall, and on the opposite side is a small piscina drain of the same period. Dr. Cox believed that these thirteenth-century windows are in brickwork of the same date, and that they have not been rebuilt into it at some later period as others suppose. He said he was satisfied that there were three stages of brickwork in the edifice which made it of exceptional interest, namely, thirteenth-century, fifteenth-century (the date of most of the building), and a general repair in 1706, the bricklayer's name of that date being recorded on a south buttress. The bricks of these three periods had all their own characteristics and shapes, and each of them differed from their modern successors.

Mr. and Mrs. Beckitt kindly entertained the members to tea in their beautiful garden, and a most cordial vote of thanks was passed to them for their hospitality, and for Mr. Beckitt's kindness in putting up with all the inconveniences that are necessarily connected with excavations on pasture land.

The winter meetings have been already planned, as well as summer excursions in May and July, the annual meeting for 1895 to be held in September at Bridlington.

HOUSING OF THE WORKING CLASSES.

A PAPER on "The Housing of the Working Classes: Sanitary Powers relating thereto in Liverpool," was read by Mr. W. Goldstraw, surveyor of buildings, Liverpool, at the Sanitary Congress. He said when the era of sanitary legislation began to dawn, more than fifty years ago, Liverpool was the first town to set a good example. In 1842 a local Act was passed "for the promotion of the health of the inhabitants" and "the better regulation of buildings." Before that date builders of house property were on the whole left free to build as they pleased, so far at least as concerned questions of health. The chief points in which the Liverpool Building Act, 1842, aimed at improving the sanitary conditions of dwellings were these:—"Increased width of streets and courts, prohibition of certain cellar dwellings, ventilation of rooms, provision of sanitary conveniences." Mr. Goldstraw then alluded to the other Acts passed, including the Liverpool Sanitary Act, 1846, the Sanitary Amendment Act, the Liverpool Improvement Act, 1864, the by-law made in the same year on the subject of open spaces in connection with dwelling-houses, the Liverpool Improvement and Waterworks Act, 1871. In the same year the restrictions as to occupation of cellar dwellings were further amended in certain details by a Local Improvement Act. But best of all in this regard the Public Health Act, 1875, had clearly laid down that no cellars were to be occupied as dwellings unless they were lawfully so occupied at the passing of the Act, and not even then unless certain structural conditions are fulfilled. It hardly need be said that no cellar dwellings had been constructed in Liverpool for more than twenty years past. Further powers affecting dwelling-houses were obtained in the Liverpool Improvement Act, 1882, when the Corporation were enabled to deal more effectually with cases of land filled up with offensive material, of streets laid out in awkward directions, of houses being built with damp foundations and of buildings occupied as dwelling-houses. The next sanitary measure bearing on the subject was the Liverpool Improvement Act, 1889. The chief provision was the prohibition of any erection on the existing open spaces in connection with houses unless in accordance with certain regulations. These regulations were afterwards applied with great advantage to all new houses by the adoption of a new by-law in 1890. He made no reference to the rather numerous and complicated statutes known as the Artisans' Dwellings Act. With this very large exception, they had now traced in outline all the general sanitary powers of the Corporation with regard to the housing of the working classes, and it only remained to inquire what was the broad result, as seen at the present time? The answer to this question might best be given briefly in the form of statistics taken at the end of 1893. The number of dwelling-houses of all kinds at present existing in the city was 106,946. Of this number it was reckoned that about 82,444 were let at gross rentals of not more than 20*l.* a year, or 7*s.* 8*d.* a week. It might therefore be said that 77 per cent. of the dwelling-houses within the city were occupied by the working classes. Out of this number of 82,444 houses of the working classes, 26,182, or 32 per cent., had been erected since 1864, under the improved regulations, and might be regarded as being in a fairly sanitary condition, and having sufficient open space. A further distinction might be drawn by classifying the occupiers of houses of which the gross rental was not more than 13*l.* a year, or 5*s.* per week, as

"the labouring class." Under this heading there were in the city about 40,400 houses, *i.e.* 38 per cent. of the whole number of houses in the city. In this number of labouring-class houses there appeared to be about 14,600 which were "insanitary," and which ought to be demolished or structurally improved. This might seem a large number, but it should be stated that during the thirty years that the Corporation had had the requisite powers 4,126 houses had been so dealt with. It might, therefore, be reasonably expected that during the next thirty years the remainder would be cleared away by the action of the Corporation, combined with the forces of natural decay and of lawless destruction. When that consummation was reached it might be hoped that Liverpool would have a labouring population moderately well housed. But as a precedent condition it would be necessary that the newer houses be let at such rentals as "the labouring class" could afford to pay. This was certainly not the case at present, for the smallest houses now being built (with the exception of a very few tenement houses) were generally let at rentals of 5*s.* 6*d.* per week, which was about double the sum which thousands in that rank of life could possibly spend on house-rent. These unfortunate or unthrifty ones now inhabited the dilapidated, and insanitary houses which must, in no long time, disappear. But where would they or their like successors live when the court houses and cellar dwellings had gone? This problem was still unsolved, yet they might hope that it was not unsolvable.

Mr. H. Percy Boulnois, city engineer of Liverpool, read a paper on "The Housing of the Working Classes: Tenement Houses, or Dwellings in Flats." It might be well, he said, to define the expression "working classes" for the purpose by taking it to apply only to the tenants of houses which were rented at not more than 20*l.* a year, or about 7*s.* 8*d.* per week—a limit which was quite sufficiently high. It might also be premised that one condition which had been rather strongly insisted upon was that the rent to be paid by the poorest of working people ought not to exceed an average of one shilling per room per week. Now it was a fact which would cause no surprise that in Liverpool the nearest approaches which had been made towards a compliance with this requirement had been in "tenement" houses or dwellings in "flats." As to the ordinary houses, all those which had been built in this city during the last thirty years might be said to come under two classes—six-roomed houses letting at a rent of about 7*s.* 6*d.* per week, and four-roomed cottages letting at a minimum rent of 5*s.* per week. It might therefore be reckoned that the rents of the usual modern houses averaged 1*s.* 3*d.* per room per week. It was said that these rents were too high for labouring men who earned only 20*s.*, or perhaps only 18*s.*, per week when in regular employment, and too high also for those whose weekly earnings were from 24*s.* to 30*s.*, but were reduced to an average of 15*s.* to 20*s.* per week by the lack of regular work. It was urged that persons of this condition in life could not possibly pay more than one-fifth of their income in rent, and even that was double the proportion paid by those more well to do. None of the cottages built in Liverpool since 1864 could be let at 1*s.* per room per week. And it was hardly probable that any such would be built in the near future, unless, perhaps, on certain sites which might have been cleared of insanitary property by the Corporation and too shallow to contain four-roomed cottages of two rooms in depth. An objection was frequently made that houses containing less than four rooms ought not to be permitted. In response, it could only be said that there were many families which do not require more than two or perhaps three ordinary rooms for reasonable conditions of decency and health, and many more which could not possibly pay a greater rent than those two or three rooms must of necessity command. Now, there was a comparatively large number of houses erected in rows or blocks of two storeys in height, in which there was on the "ground floor" level a series of complete houses, each containing two or three rooms, and on the "first floor" level another set of complete houses of the same dimensions as those below, each one entered by an independent stair directly from the street. These are commonly known as "Scotch" houses, though the term appears to be rather a misnomer. Of "tenement" houses, "terrace" houses or dwellings in "flats," more properly so-called, there are about 120 blocks containing some 3,000 houses or dwellings. They varied somewhat as to size, arrangement and rental, as there had been a degree of development in their characteristics. He proceeded to describe them as nearly as possible in order of date. In the first place, he described a certain attempt to provide cheap dwellings in 1863, these dwellings being three storeys in height and let at rentals of from 1*s.* 4*d.* to 1*s.* 2*d.* per room. In an adjoining street dwellings four storeys high were erected in 1867, and were let at from 1*s.* 10*d.* to 1*s.* 4*d.* per room. Both were built by an able and enterprising builder, who still retained the ownership. The net rent on outlay was 4 per cent., 17 per cent. of the dwellings being at present unoccupied. The next instance were three-storey blocks built in 1865, and let at from 4*s.* 6*d.* to 5*s.* 9*d.* per dwelling. There were fifty-one

tenements. The original owner regarded the venture as a failure. Mr. Boulnois then described a tenement block of different kind built in 1867, and consisting of tenements of four and six rooms. The rents were 3s. 6d. and 5s. 6d., which were less than 1s. per room per week, but the profit on capital invested was *nil*. He proceeded to speak of the erection by the Corporation of St. Martin's Cottages, Sylvester Street. The lettings of these buildings were at the rate of from 1s. 3½d. to 1s. 7½d. per room. The net return had averaged 3½ per cent. These cottages were a strong and intelligent effort to make a worthy contribution to the necessities of the times, and no important improvement had been made in subsequent designs. In 1868 two blocks of 150 dwellings each were erected by a public-spirited company, but recently the property was transferred to a private owner. From 1869 to 1871 two large blocks were built near to the northern boundary of the borough, and very near to the line of docks. Each block occupied the whole of one side of a street which opened at each end into a main road where tramways were laid. No conditions could be more favourable. A large common open space was provided at the rear of each block. Each of the three storeys formed a separate "flat" and had a continuous balcony running along the front. Every house consisted of a living room, three bedrooms and a scullery with other convenient places, making practically a five-roomed tenement. But even if they reckoned it as having only four rooms, it would be found that as the rents were 5s., 4s. 6d. and 4s., according to the height, the rate per room was but 1s. 3d., 1s. 1½d. or 1s., as the case might be. And as the rent included a free gas supply, worth, say, 3d. per week, the rate per room was actually reduced to 1s. 2½d., 1s. 0¾d. and 11¼d. Surely, it would be said, here was a success. Unfortunately the facts told a different tale. Whether it was that the houses were practically too large for the wretched class of tenants, who might prefer a two-roomed house at half a crown a week to a four-roomed one at 4s., or whether the property generally was rather unattractive from its want of repair—not a strong reason with such tenants—certain it was that the houses "let" badly. Out of 180 tenements in the street there are 41, or nearly 23 per cent., unoccupied, and many had apparently been so for years past. Almost all were dirty and somewhat disreputable-looking. The fine open spaces at the rear were of no advantage as either drying-grounds or playgrounds; they were places for refuse and ruffians. One section of the property was under the management of an agent of wide experience and high standing, who evidently was striving to keep it in good repair, and to secure fairly suitable tenants. Yet he assured him (Mr. Boulnois) that "the rents collected were not sufficient to pay charges, namely, rates, gas and ground-rent." He had dwelt on this example because it was typical of a number of similar cases. It was during the years from 1863 to 1871 that the tendency to the erection of dwellings in "flats" was most strongly manifested. Trade was good and wages high; the newly-erected tenement property then paid easily 10 per cent. on the outlay. In many of these cases the return was now practically nothing. After that time there was no movement of special interest until 1883, when the Corporation undertook the erection of the Victoria Square Dwellings, on a site cleared of insanitary property by a compulsory demolition known as the Nash Grove scheme. These imposing erections were designed by the city engineer of that time. The cost of the buildings alone was 58,000*l*. They were five storeys in height, and 272 tenements had been provided at rentals of 5s. 3d. for three rooms, 4s. 3d. for two rooms, and 2s. 9d. for one room, inclusive of gas. It would be seen that the rates per room, when 3d. per week was deducted for gas, were 1s. 8d., 2s. and 2s. 6d.—much above the 1s. standard. The Corporation were able to secure the reasonable return of 2½ per cent. and to provide good houses at a moderate rent; but the problem before them was hardly one step advanced. In 1887, however, the Corporation made another incursion into the region they were exploring. They erected on the opposite side of the street four blocks of tenements, each four storeys high and comprising 100 separate dwellings. They were erected to the premiated designs of eminent Liverpool architects, and formed probably one of the best examples of good and inexpensive dwellings on the block system which had yet been devised. The interest received by the Corporation on the total cost was about 3½ per cent. The rentals of the two classes of dwellings are as follow:—Two rooms, 4s.; one room, 2s. 6d. It appeared therefore that the desired one shilling rate had not been reached. It now only remained to refer to the latest instance, which was on a small scale. An owner of property who had had a wide experience had just finished the erection of twenty self-contained cottage "flats," in blocks of two storeys. They were planned by an able civil engineer and architect, fully acquainted with all the conditions of the problem. This was in a great degree a reversion to the type of the so-called "Scotch" houses. But it is a developed type. The upper houses had a small yard at the rear, on the same level as the living rooms, and the water-closets and dust-shoots are detached from the main building.

There was a rather large open space on the ground level at the rear of each house, the by-law in that behalf being fully complied with. Each tenement consists of two rooms, and is let at a rental of 5s. and 5s. 6d. per week. Here, then, we have a case of the looked-for kind of houses—houses having the character of independent cottages, with a reasonable minimum of accommodation. The great point of interest was whether in twenty-five years' time it would be found that, in spite of all leakage and deterioration, this property, from the owners' point of view, will sufficiently justify its existence. This last-cited example was one of several indications that the ordinary builders and owners of cottage property did not now regard the "tenement" or "flat" type of house with favour. It was evident that the ordinary builder would not readily undertake the supply. So far as he was concerned, the past experiments had been chiefly failures. The dilapidated and dirty condition of the tenement blocks which were in the hands of individual owners, and the great losses which those owners undoubtedly suffered from low-class and unmanageable tenants, seemed to point to the conclusion that such blocks should be owned and managed by powerful bodies, companies or corporations, who could and would keep both the buildings and the tenants in fairly decent order. The cheapest of cheap dwellings were unquestionably wanted; they could only be supplied by the strongest of strong hands.

Sir Francis Powell said the two papers had made it clear that the cost of providing dwellings in which the humblest classes might live in circumstances of decency was in excess of the wages which those classes had at their command. The more they discussed the question the more difficult did it appear. Parliament had fully armed the municipal authorities with the powers to erect those dwellings, but his own doubts had been increased almost to a certainty that it was impossible to make this enterprise attractive to private capital, because if they built houses cheaply the life of those houses would, from the character of their occupants, be short; so that in the long run the cheaply built house would be no more remunerative than the dearer one. He was adverse to having the common fund of the community used in competition with private capital, and yet they were driven to the conclusion that if they were to deal with populations of a humble type densely gathered together in limited areas as in Liverpool, they must have recourse to a public fund. Practically, they could accommodate these people in no other way.

Dr. Sykes said the London County Council did not derive more than 3 per cent. on their outlay at a standard rental of 2s. 6d. per room; the rental per room was in no case less than 2s. If Liverpool could not make this class of dwellings pay, the problem appeared, as far as London was concerned, unsolvable.

Dr. Pernewan asked why the Liverpool Corporation had not put the Housing of the Working Classes Act into operation over the large insanitary areas of the city? There could be no question, in his opinion, that buildings of this class must be done by corporations.

Mr. H. H. Collins said that in Deptford there were in existence whole streets of tenements which paid their owner 6 and 7 per cent. He suspected that the failures recorded lay very largely in management, and in the tenements being allowed to fall into dilapidation. Another difficulty was the increased cost of building, which he attributed to strikes and want of care, judgment and generosity on the part of workmen. It was right that if the latter created the difficulty they should pay for it in increased rent. He deprecated private enterprise being discouraged, and mentioned that the Rothschild buildings in London paid 4 per cent. Mr. Robert Vigers, an administrator of the Peabody fund, found that dwellings built in London on the Peabody system could not be let at less than 1s. 10½d. per room per week. The dwellings erected by private enterprise let at 7s. 6d. per four-roomed flat, which was self-contained. It was preferable that dwellings should be erected by wholesome enterprise rather than either by public bodies or by philanthropists.

Mr. C. S. Pain regretted that the experiments in tenement houses in Liverpool had not been successful, because if this provision had to be made by corporations it would be made without that moral influence on the tenants which was exercised, for example, by Miss Octavia Hill, and could be brought to bear by philanthropic private persons.

Professor Spinks condemned back-to-back houses, and pointed out that it had gone forth from the Congress that they had been spoken of with approval. In Salford the death-rate in houses of that class was 50 per cent. in excess of the mortality in houses with through ventilation.

Mr. Boulnois, replying, said he had arrived at the 1s. per room standard as being all that labouring men ought to be called upon to pay. The Artisans' Dwellings Act had not been put in force because the compulsory acquisition of valuable properties would mean a heavy burden on the ratepayers.

The President, in closing the discussion, desired to say that the approval of back-to-back houses had not been expressed by any body holding an official capacity in the present Congress.

SANITATION IN LIVERPOOL.

THE subject selected by Mr. G. F. Deacon for his presidential address in the Section of Engineering and Architecture at the Sanitary Congress at Liverpool was the sanitation of the city, many of the works having been carried out by him. He said:—

It is natural, and it will no doubt be expected, that this great city, in which for twenty-five years, beginning in 1865, I was professionally engaged, should receive the first share of my remarks, and it is natural also that a later portion should be devoted to the Metropolis, to which some years ago I gravitated, in that spirit of evil centralisation which as sanitarians we all so greatly deplore, but nevertheless recognise as an inevitable incident of modern life. In his masterly address as president of the health section of the Social Science Congress held in Liverpool eighteen years ago, the late Mr. Thomas Hawksley pointed out that the habit of sanitary philosophers to regard the health of Liverpool as exceptionally and pre-eminently bad, was even then not justified. Mr. Hawksley compared the state of Liverpool with the state of the other large cities most nearly approaching her in magnitude—namely, Manchester and Glasgow—showing successfully that even at that time the comparison was favourable to Liverpool; and, if we continue the investigation, we find that from 1876 the relative death-rate of Liverpool has very materially decreased. But when in conjunction with these facts we take into consideration the circumstance that the mean density of the population of Manchester and Glasgow, though lower in 1876 than that of Liverpool, has decreased, owing partly to the extension of boundaries, much more rapidly than in the case of Liverpool, and that the absolute density of Manchester is now only 40 per cent. and of Glasgow only 58 per cent. of that of Liverpool, the significance of the change becomes still more striking. According to the Registrar-General's returns the number of persons per acre at the different dates had been as follows:—1871: Liverpool, 97.0; Manchester, 78.0; Glasgow, 95.0. 1876: Liverpool, 100.1; Manchester, 83.4; Glasgow, 90.4. 1893: Liverpool, 97.9; Manchester, 39.9; Glasgow, 57.3.

If instead of considering the total mortality in the towns very appropriately compared by Mr. Hawksley, we regard only the deaths from those zymotic diseases which are chiefly affected by sanitary conditions, and make the comparison with the seventeen large towns and cities of England for which, in addition to Liverpool, the Registrar-General in 1872 enumerated the zymotic diseases separately, we find an equally satisfactory improvement. It appears that, compared with the other seventeen towns having a density of population only one-third that of Liverpool, the excess of mortality in Liverpool from the diseases in question, which prior to 1876 was nearly 2 per 1,000, has from 1876 onwards been less than 1 per 1,000.

If now, instead of investigating the mortality returns of the great towns of this country and discovering by that investigation that at or about the beginning of 1876 a change took place for the better in the health of Liverpool which was not equally shared in by the mean of the other seventeen towns, we study the history of her sanitary engineering—of the physical development of those principles upon the importance of which we, as sanitarians, are substantially agreed—what do we find? Running over the various operations of the whole twenty-five years we notice, for example, that remarkable activity was shown between the years 1871 and 1875. Let us begin with the water supply. From the year 1865 the supply had been intermittent, under conditions which, as I had occasion to report at the time, and firmly believe now, caused impurities of the most serious kind to find access to the mains during the intermissions, and to be delivered to consumers on each occasion of the resumption of supply. In 1874 the remedy for this state of things was begun. On the last day of 1875 every district of Liverpool had been provided from the old sources with a constant supply of water under higher pressure than before. On that day the valve of the last intermittent district was turned full open with much circumstance and rejoicing by the then chairman of the water committee, the late Mr. J. H. Wilson, to whose energy and steadfast conviction was largely due the completeness of the success attained, and thus before our critical year of 1876, Liverpool has received the full blessing of a constant supply, which has rarely been interrupted since.

To turn now to the sewerage. It had been the dream of my predecessor, the late Mr. James Newlands (the first borough engineer created, for he, like his successors, held office under a special Act passed in 1846), to seal hermetically the whole of the sewage directly it passed into the drains. It was a greatly to be desired vision, but one which, as we now well know, never could have been realised. It was essential that there should be a flow of pure air into the sewers, and accordingly before 1876 the system of ventilation now in operation, consisting simply of the familiar open grid in the middle of the carriageway, had been largely carried out. But this work was not undertaken without first considering in each case the

internal condition of the sewer to which it was to be applied. Except when actual renewal was called for, the worst sewers were thoroughly repaired, and provided where necessary with new inverts of Portland cement. Sewers so treated and others in good condition were then ventilated, without causing the slightest nuisance except in the neighbourhood of places where they were used for the discharge of hot water or steam. By my immediate successor, Mr. Dunscombe, and by my successor Mr. Boulnois, this work of sewer renewal had been most ably continued. It possessed features which were, I believe, novel when the work was begun, and which, so far as I know, had not been adopted elsewhere. I commend them to the attention of all engineers who had to deal with old sewers. The principal other sanitary work carried out before the critical year of 1876 was the removal of the cellar water taps and the closing of the cellar drains in a large proportion of the houses of 1,674 courts occupied by the lowest classes. These private drains and their traps were generally defective, and the work of closing them was done by the Corporation as a result of a bargain with the landlords concerning the supply of the substituted water-fittings—a suggestive instance of the advantage of municipal control of waterworks. Before the same critical date many other sanitary improvements were made; impervious paving, for example, was introduced in 1871, and has since been rapidly continued; but the changes of greatest importance I have already enumerated, and it was impossible not to be struck by their coincidence with the great comparative reduction of zymotic and general mortality. The conclusions I leave to others, only remarking that it must be exceedingly satisfactory to the people of this great city to know that the reputation for pre-eminently bad health had long ceased to be merited, and that when properly compared with other similar places the health of Liverpool takes a high position.

Liverpool has the good fortune to be situated upon a great estuary, and to experience but little difficulty in disposing of her refuse. The liquid sewage is discharged into a wide and deep channel, which also receives and discharges twice daily during neap tides 282,000,000 cubic yards, and at spring tides no less than 700,000,000 cubic yards of water—volumes so enormous in relation to the sewage that, prosper as Liverpool may, there can never be any sound objection, if the outfalls are properly chosen, to maintaining the present condition of things. The population within the watershed of the Mersey is less than twice that within the watershed of the Thames above Molesey, near which place 70 per cent. of the London water-supply is drawn, while the mean ebb of the Mersey is about 140 times that of the mean discharge of the Thames past the same place.

Again, as regards the disposal of solid refuse, Liverpool is well placed. In 1871, when I was first called upon to inquire into the matter, all such refuse was sent away by railway or canal, or used for filling up claypits. In 1872 I used with success a considerable quantity of asphalt refuse for the purpose of raising steam. The possibility of conveying this refuse to sea was also investigated, and in 1879 the *Alpha* was designed and built. She carried 380 cubic yards, and on reaching her destination in the outer estuary of the Mersey beyond the bar, at a distance of about twenty-two miles from the Liverpool landing-stage, deposited her load in a few seconds in deep water. The low cost of this mode of disposal left little room for the successful competition of "destructors," and for a time burning was suspended. But with the rapid extension of suburban Liverpool the available outlets in a landward direction have year by year diminished, and the present city engineer, Mr. Boulnois, has very successfully revived the destruction of a portion of the refuse by fire. There is absolutely no objection to tipping this refuse into deep water, and where it is the cheapest it is the best course to adopt. Where it is not the cheapest, destruction by fire, with proper precautions, is from a sanitary point of view quite satisfactory. The combustion may be made complete, and there need not be a sign of smoke.

In 1869 Mr. William Williams, a very ingenious member of the Corporation of Liverpool, patented a joint for cast-iron pipes on the principle, not of the ball and socket, but of the sphere and cylinder, and that principle has since been applied to stoneware pipes. Under certain conditions to be attained by sufficient and intelligent inspection and by the use of proper jointing material and special but simple pipe-laying apparatus, the principle of such joints may be employed with perfect success and even with economy in first cost. Pipes so jointed may be rapidly laid in any ground. The spherical segment and its containing cylinder admit both of flexure and longitudinal extension, and if the jointing material is satisfactory it will permit, as I have ascertained on a large scale, of far more movement than in practice ever occurs while the ground is settling down, and that without any leakage even under pressure, and I have no doubt other methods of securing the same end may be devised. This being so it is to be hoped that engineers will in future insist upon water-tightness—not merely upon the insertion of the word in the specification, but upon

the antecedent conditions necessary for its attainment, and upon its actual accomplishment by the contractor. This absence of water-tightness is a serious matter in point of expense. It is a still more serious matter in its sanitary aspect. There is certainly room for great improvement in these matters, but we cannot hope to attain even approximate perfection. The thought of this and of inevitable increase in the density of our population emphasises in my mind the very strong feeling that for our supplies of potable water we ought so far as possible to go beyond the limits of human habitation.

Returning to Liverpool, I find it necessary to revert to the water-supply. The facts are not difficult to comprehend. Comparing the mean supply of the four years prior to 1874 with 1876, when intermittent service had entirely ceased and a constant service under increased pressure has taken its place, we find that in 1876 the loss by leakage had already been so far moderated that a supply was given for metered trade purposes increased by 25 per cent., and unrestricted for domestic and all other purposes to a population already increased by 33,000 persons, with 12 per cent. less water than in the previous period. When to this I add that the revenue went on increasing from additional water sold to new populations and to new trade consumers, who continued to be supplied from constantly-increasing savings of the water formerly lost by leakage, you will understand the otherwise inexplicable fact that without any increase in the charges for water Liverpool continued from the year 1880 up to the year 1889 to pay the interest upon the expenditure, amounting at that time to more than 1,750,000*l.*, incurred in connection with the great scheme of water-supply which was opened and brought into use in 1892, and so important had the surplus thus realised continued to be that even now, after the expenditure of 2,250,000*l.* upon the new works, the charge for domestic water-supply—nearly two-thirds of the whole—has only been increased, and that temporarily I think, by 1*½d.* in the pound, while the charge for manufacturing supplies, about one-third of the whole, has been reduced from 9*d.* to 6*d.* in the pound. Never, I believe, in the history of waterworks has a financial condition so satisfactory in all its bearings accompanied the completion of new works, the interest upon the cost of which has been defrayed entirely from the revenue of the waterworks undertaking. I make no apology for referring to financial success of this kind in an address devoted to sanitary advancement. The case of Liverpool, it may be said, must have been exceptional. A pretty large knowledge of the works of this country, and of many of those on the Continent, enables me to assert that this is not so. In many other places equally satisfactory results have been attained, and there are still many in which, with proper personal attention, similar results can be attained, but active personal attention, I would almost add enthusiasm, on the part of some one properly qualified in relation to the magnitude of the undertaking, and determined to make his work a success, is a prime necessity. To Liverpool such services have been most ably and completely rendered by Mr. Joseph Parry, the present water engineer, who from its inception took a leading part in the organisation and management of the work which has brought about the remarkable changes I have explained to you. In this, as in many other particulars, it would be difficult to over-estimate the value of Mr. Parry's services to the water estate. Of the great supply of water which Liverpool has thus so cheaply secured from the river Vyrnwy, in Montgomeryshire, there is little time to speak to you. I will therefore only observe that it is drawn from a source of the greatest possible purity, so far as organic matter of animal origin is concerned; that, as delivered to the consumer, it is free from any other impurity which can render water unwholesome, hard or unpleasant to the sight, and that it is abundant in quantity. When speaking of the means by which the sanitary and financial success which I claim for Liverpool have been attained, I stated that many other places may still be similarly benefited; the greatest of all, London, is not an exception. I shall not suggest that municipal management in matters of water supply is of necessity better than the management of trading companies, but I feel very strongly that the water supply of the Metropolis will not be placed upon a satisfactory footing until it is worked entirely in the interests of the consumers.

The history of the companies, even since the Metropolis Water Act, 1871, was passed, abundantly supports this view. After twenty-three years there are 1,250,000 persons in the Metropolis still receiving an intermittent supply. Liverpool, as a municipality, made up her mind in the matter in the beginning of July 1874, and in less than eighteen months, as I have already explained to you, the work had been accomplished with financial profit.

It does seem to me to behove us to throw our weight against a policy which would substitute for waters such as those of Loch Katrine, of Lake Vyrnwy, or of Lake Thirlmere other waters, for the supply of our great communities, the bacteriological purity of which has only been negatively determined, the constant quality of which is uncertain, and the origin of

which is impure. The day is very far distant—if, indeed, it will ever come—when pure mountain water, taken virtually from above the limits of human habitation, or drawn from perfectly safe sources underground, will be insufficient to supply the wants of this country; till then, is it wise to continue to invest our capital in, and to prolong the life of, undertakings which are dependent for their safety entirely upon the continuity and perfection of artificial processes of purification? Much has been said about "sentimental objection." The term may be one of opprobrium, or it may not, but it is certainly a very real objection. It is an objection which I do not think will be removed by any discoveries as to the wonderful efficacy of microbes, mud enwrapped in dead or living myriads, lying in a fine film over the surface of our filter beds, to prevent the passage of on-coming bacilli, and while it exists a greater question is involved.

AIR PURIFICATION IN HOSPITALS.

AT the Sanitary Congress at Liverpool, at the instance of Mr. William Henman, the question of the purification of air emitted from hospitals devoted to the treatment of infectious disease was considered. At the outset Mr. Henman insisted that the air was a chief means for the conveyance of disease, and that the evidence at command left little doubt of the presence of numerous disease spores in the atmosphere. In these circumstances, the importance of purifying the air emitted from infectious disease hospitals became evident. Discussing the means of purification by heat, he illustrated with the aid of plans and sections ventilating apparatus in operation at hospitals in Nottingham, Bradford, Blackburn, Barnsley, and other towns, all designed, though differing in details, to draw the air from the wards through furnaces, where it was exposed to a given temperature before being allowed to pass into the outer atmosphere. As the apparatus referred to were ingenious, he discussed them collectively and comparatively from four points of view—first, initial cost; second, cost of maintenance; third, effective ventilation of the buildings; and, fourth, the state of the air discharged. His conclusion was that the method was expensive. In addition to these appliances, he had, however, inspected one which had given good results at the Victoria Infirmary, Glasgow, and designed by Mr. William Key, C.E. It was a system adopted after inquiry for the large new general hospital at Birmingham. An important feature of it was the air-washing screen, which cleansed the air entering the buildings of all dirt, fog, flies, moths and a large proportion of disease germs. Bearing this in mind, he was led to believe that outgoing air might be similarly purified, and he had adopted that improvement at Birmingham. By means of the completed method the fresh air continually entering forced the vitiated air again through the cleansing screens, so that the air in the wards was kept always in a state of purity and equalised humidity. A simple contrivance was employed to keep the screens constantly charged with a weak solution of carbolic, and which was found by experiment perfectly effective in destroying the germs of disease. By finer screens and a slower current of air the results were still more complete, and the current could be regulated to any velocity by a rotary fan. In conclusion, he expressed the opinion that the destruction and entrapping of disease germs emitted from infectious hospitals would do much to banish infectious disease entirely from our coasts.

Sir T. Crawford expressed an opinion adverse to the system advocated by Mr. Henman, on the ground that no hospital ought to be built in a position where the ingoing air had to be pumped.

THE LATE GIAN BATTISTA DE ROSSI.

THE Florentine correspondent of the *Scotsman* gives the following reminiscences of the renowned archæologist:—

Three years ago I gave some account of the Senator Pietro Rosa, the excavator of the Appian Way and of the Palace of the Caesars, of which latter he remained till death the official conservator, having his residence, in fact, on the north-eastern aspect of the Palatine overlooking the Via Sacra. To-day I have to perform a similar task for a yet mightier historical "rehabilitator," the Commendatore Gian Battista de Rossi, the true "Columbus of the Catacombs," the leader of Christian archæology, if not, in the strictly scientific sense, its actual creator. For more than a year a sufferer—he had two apoplectic seizures within a brief interval of each other—he had lived in retirement at Castel Gandolfo, under the shadow of the summer palace of the Popes, a magnificent yet deserted mansion, as silent and as melancholy as the Alban Lake over which it hangs. Within the last day or two his condition had become hopeless, and on September 20, when all Rome (except the Vatican) was celebrating the twenty-fourth anniversary of the triumphal entry of the Italian troops, he died of what his

physician describes as "cardiac and intestinal paralysis." He was in his seventy-third year.

When last I saw him, in the December of 1892, at the German Archæological Institute on the Capitol, he was indeed a changed man from what he used to be in the old days when Henzen was its first secretary, and Helbig the second in command. Then he was one of the phalanx that in the library of the Institute gathered round the green table under the presidency of the German ambassador, generally sitting to the right of Henzen and facing the distinguished excavator of Pompeii, Giuseppe Fiorelli. Almost no archæological problem, however difficult, could resist the combined attack of that phalanx. Epigraphy, of which Henzen was a master, hardly superior, if at all, to De Rossi himself, or to Mommsen, who frequently took part in those encounters; excavation in all its aspects, topographical, architectural and constructive, of which Fiorelli and Lanciani were the representatives; antique fine art, in which Helbig was a practised connoisseur; the archæology of coins and gems, in which Bernabei has still no equal—such were the departments, such their heads, apt to be called upon in the discussion of the question of the day, all of them capable singly, and still more collectively, of setting it in the clearest light and forcing it to yield up its secret. Well do I remember after Lanciani's brilliant account of his excavation of the House of the Vestal Virgins, a problem started in the conversation that followed—a problem dealing with the discipline of the Vestals in cases when punishment had to be inflicted on one of their number for breach of duty. Before the conversion of Constantine to Christianity, the Emperor was still Pontifex Maximus, and as such the control of all religious orders, including the Vestals, remained in his hands. But when by that conversion the dignity of Pontifex Maximus lapsed, and with it his authority, the question arose, on whom devolved the power of exercising discipline over the Vestals? An animated discussion circled around the point, but no real light was thrown upon it till De Rossi put his finger on a passage in the letters of Symmachus, proving clearly that authority over the Virgins (who were still tolerated as a sisterhood) was vested in the Prefect of Rome. In fact, the *Præfectus Urbis* (the mayor or lord provost of the city) exercised on more than one occasion the discipline in question.

This was but an incidental example of the comprehensive reading and prompt acumen De Rossi had ever at command in researches and speculations of the highest historical import. Fortune, too, favoured the ardent votary, and enabled him to put more "discoveries" to his credit than almost any of his compeers. He was not yet thirty years of age when he made a special study of the inscriptions in the Catacombs, particularly those of the first century, and, in the course of it, settled more than one question of collateral interest. Let me cite one. Pomponio Leto, the great humanist of the fifteenth century, founded in Rome an academy for the study of the classics, and was joined by celebrities like Cardinal Platina, author of the "Lives of the Popes;" Giovanni Antonio Campano, Bishop of Teramo; Pietro Sabino, professor of epigraphy in the University of Rome; Marc Antonio Sabellico, Pietro Pallini and many others. These enthusiastic philologists, either for having adopted the names of heathen magnates or for their zeal in favour of classical philosophy and civilisation, were popularly denounced as apostates from Christianity, as adorers of false deities and as traitors to the Pope's authority, if not conspirators against his life. Thrown into the prison of Castel Saint Angelo by Paul II., they were accused of conspiring to supplant the Pontiff in favour of their chief, Pomponio Leto. Cardinal Platina defended himself and his colleagues, and Pomponio addressed the tribunal in a memorable speech, the original of which is preserved according to Lanciani in the Vatican. Positive evidence was lacking to incriminate them, and this, aided by the intercession of powerful friends, secured their release and the rehabilitation of the Academy. How lucky they were would never have been known but for a discovery made by De Rossi in the Catacombs of St. Callixtus on May 12, 1852. In a "cubiculum" (dormitory) in the remotest recess of that subterranean labyrinth he came upon the spot where Pomponio and his confederates assembled in secret. "On the white plaster of the ceiling," writes Lanciani, "the following inscription had been written with the smoke of a tallow candle:—January 16, 1475. Pantagathus, Mammeius, Papyrius, Minicius, Ærailius, Minucius, all of them admirers and investigators of antiquities and the delight of the Roman dissolute women, have met here under the reign of Pomponius, Supreme Pontiff." Whether meant in burlesque or in sober earnest, that inscription if it had been known to Paul II. and his tribunal, would have cost those distinguished humanists their necks.

Time would fail me even to catalogue the treasure-trove De Rossi has added to the history of Christianity and of its religious development in Rome. I need but allude to his epoch-making "Inscriptiones Christianæ Urbis Romæ septimo Seculo antiquiores" (Rome, 1857); his "Roma Sotterranea" (1864-77), a mine of lore reproduced in French and English;

his "Musaici Cristiani," from the basilicas of Rome (1872-85, parts 1-14), to say nothing of his contributions to the periodical founded by himself in 1863—the "Bollettino di Archeologia Cristiana." A list of his collected works was compiled on the occasion of his jubilee in 1882, and published in the "Albo dei Sottoscrittori per la Medaglia d'Oro in onore del Commendatore G. B. de Rossi." Those subscribers included nearly every name of note in the study of classical and Christian antiquities throughout the world, and the presentation of the medal itself, which took place in the Lateran, was one of the most impressive scenes ever witnessed in the Eternal City. One memorable piece of work in which he was engaged must not be passed over—his collaboration with Mommsen in the "Corpus Universale Inscriptionum Latinarum," published at Berlin.

He had the rare distinction of being equally welcome and beloved in Pontifical and in Young Italian circles. He was not only, as I have mentioned, one of the "Dii Majorum Gentium" of the German Archæological Institute in Rome, but also of that very exclusive body, the "Pontificia Accademia di Archeologia." His work in the Vatican library was as unique and valuable as his communications to the "Atti," or transactions of German, Austrian, or French antiquarian societies, of nearly all of which he was a corresponding member. He was a devoted adherent of the Holy See, and, like his great countryman Manzoni, laboured in its defence, though from the antiquarian rather than the polemical side. Highly esteemed at the Quirinal, it was not in King Humbert's power to confer on him the honour bestowed on Rosa—that of Senator in the Italian Legislature. I am not sure whether it was not offered to him, but if it were loyalty to his Pontifical master must have made him decline it. As his presence was striking, so his disposition was singularly lovable and engaging—always placing his unique stores at the service of students, and never more happy than when accompanying a party of scholars of the most diverse nationalities over the basilicas or through the Catacombs in and around the Eternal City.

THE ISLE OF MAN.

THE members of the Cumberland and Westmorland Archæological and Antiquarian Society last week went on an excursion to the Isle of Man. The party, numbering nearly fifty members of the Society and friends, says the *Carlisle Journal*, left Barrow shortly before two o'clock on Monday, and had a delightful passage across the Irish Sea in bright sunshine until nearing the Manx coast, when the voyagers began to recall the local legend that the magician Mannanin kept the island to himself by concealing it from the sea under a cloud of mist. The beautiful Bay of Douglas was much admired. The party was landed at the Victoria Pier at about a quarter to six. They were met and cordially welcomed by his Honour Deemster Gill, Mr. P. M. C. Kermodé, F.S.A., honorary secretary to the Isle of Man Natural History and Antiquarian Society, the Rev. S. A. P. Kermodé, vicar of Onchan, and others interested in archæological and antiquarian studies.

The Society's headquarters in the island were at the Castle Mona Hotel, an imposing building which stands in the centre of the crescent of Douglas Bay, and was formerly the residence of the Dukes of Athole, "Lords of Man," by whom it was built at a cost of 40,000*l.* After dinner a meeting was held at which papers were read, new members were elected and general business of the Society was transacted. The following papers were on the agenda of the week:—"Chap-books," by the president, Mr. Chancellor Ferguson; "Church Bells of Leath Ward, No. 4," by the Rev. H. Whitehead; "Cumberland Registers, No. 1, Eskdale Ward," by the Rev. H. Whitehead; "Roman Tiles found in Carlisle," by the President; "Roman Figure from Old Carlisle," by the President, and "Some Manx Names in Cumbria," by Mr. W. G. Collingwood. The President's paper was founded upon the remarkably fine collection of about 200 "chap-books" which form part of the Jackson Library in Tullie House. More than half of these books having been printed in Carlisle or other towns in the county, the Chancellor took the opportunity of introducing into his long and exhaustive paper some information which he had collected about the early history of printing in Cumberland. Some of the chap-books—little stitched brochures which pedlars hawked about the country—were printed between 1770 and 1800. About fifteen of the Tullie House collection were printed by the Jollies, the founders of the *Carlisle Journal*, towards the end of last century; but Ann Bell, of Penrith, was the printer of the largest number, about forty of them having issued from her press. Soulbey, of Penrith, also produced about fifteen, and the other local printers included Hetherington of Wigton, Dunne of Whitehaven, Harrop of Alston, Allison of Penrith and others. Chancellor Ferguson's paper was of considerable importance, and Mr. W. G. Collingwood's paper on Manx names in Cumbria was of much archæological interest. Both will be

published in due course in the Transactions. The Roman figure from Old Carlisle exhibited was that silver ornament which was described lately in the Journal.

The antiquarians were astir early on Tuesday morning, and the weather being bright and fine the bay and its surroundings were seen to great advantage. The day's explorations lay in the southern district of the island, and onward as far as Port St. Mary. By nine o'clock the party was *en route*. The first halt was made at Oatlands, in Santon parish, to view an old sepulchral mound. At Ballasalla the ruins of Rushen Abbey were inspected, at Malew some old church furniture, and at Castletown, under the guidance of Her Majesty's Attorney-General in the Island, the party roamed over Castle Rushen. This castle is one of great strength, and is of Edwardian or Concentric style. The rooms occupied by the Derby family were inspected with great interest, as also the museum, where several crosses and other ancient monuments were shown. At Ballaqueeney, near Port St. Mary, two fine ogham stones, the property of Mr. Henry Kelly, were shown to the antiquarian party. They were discovered in a sepulchral mound close by, where, as shown by excavations, both Christian and Pagan interments had been made. The excursionists returned to Douglas in the evening, calling on the way at Arbory Church. Every facility, it should be stated, had been afforded to them to prosecute their researches. The Lieutenant-Governor of the island, Sir Joseph West Ridgeway, had placed Peel Castle, Castle Rushen and other places of antiquarian interest in the custody of the insular Government at the disposal of the Society, who had also been cordially invited to inspect antiquities controlled by private individuals.

Fine weather again favoured the party on Wednesday. Having explored the south on Tuesday, the field chosen for the second day's investigations was in the western district. The visitors left Douglas in good time in the morning under most agreeable circumstances. The air was clear and the sunshine bright. They drove first to Braddan Churchyard, which was inspected under the guidance of the Rev. W. S. Calverley, F.S.A. Some runic crosses and other monuments of antiquity were examined with much interest. The next stage was the Tynwald Hill, on which the Manx Legislature yet annually assembles, as it did nine centuries ago in King Orry's days, for the promulgation *viva voce* of the laws passed during the year. "Tynwald Day," says Mr. Hall Caine, "is more to the Manxman than Independence Day to the American. Not only is it the sign manual of his liberty; it is the story of his people. Tynwald Day is a witness to the Manxman's descent from his Norse ancestors." Tynwald Day is Old Midsummer Day, the fifth of July by the present calendar. On Tynwald Hill the Manxmen gather in thousands, and the ancient ceremonial of reading the titles of the new laws in English and then reciting the same titles in Manx is gone through. Mr. Hall Caine, who was present at this promulgation of laws on Tynwald Day last year, found that the scene had not been well stage-managed. "Nevertheless," he adds, "I should be sorry to see the old custom of Tynwald abandoned. Some day some Manxman may have it in him to breathe life into those dry bones. Meantime the Open-air Parliament of Man is unique if not overpowering, and beautiful if not solemn and stirring." As the antiquarians were viewing the scene of these quaint and curious ceremonials Deemster Gill favoured them with an interesting exposition of Manx government generally, and the Tynwald Hill legislative assemblage in particular. The party afterwards drove to Peel Castle, which stands on the extreme western coast of the island, and was the scene of part of Sir Walter Scott's "Peveril of the Peak." This fortress stands upon a bold rocky headland upon which a Norwegian ship, the *St. George*, was wrecked some four or five years ago, when the Peel lifeboat crew, commanded by their famous coxswain, "Charlie," performed prodigies of gallantry. The picturesque ruins of Peel Castle and Cathedral were also explored on Wednesday, and proceeding to Kirk Michael the party viewed in the churchyard some fine crosses, which were explained by Mr. Kermodé. Of course the tomb of Bishop Wilson was not overlooked. The party returned to Douglas through the beautiful pass of Glen Helen—otherwise Rhenass. Mr. Hall Caine, who must still be quoted as the chosen exponent of the beauties of Manxland and of the history, the manners and customs of its people, regards as the peculiar feature and special charm of the landscape of the Isle of Man, "its narrow, winding, sinuous, dark and slumberous glens." Glen Helen is not the largest of these, but it is one of the most picturesque, and the archaeologists, after spending so many hours of the day in contemplating the past, found it very delightful on their return towards Douglas to admire the natural beauties which lay spread around them.

On the day following the route of the explorers lay northwards to Ramsey, by way of Kirk Onchan, where there were more crosses to be inspected, and through the beautiful Sulby Glen, which Mr. Hall Caine has invested with fresh interest by laying there the scene of his latest clever novel "The Manxman," and peopling it with those life-like creations of his

fancy, Pete and Philip and Kate. At Ramsey the exhibits included a chalice from Jurby, casts from several crosses, and neolithic remains. In the afternoon the course of the excursionists lay by way of Kirk Maughold and the famous Laxey, by the grave of King Orry and Cloven Stones, and so back to Douglas, where the programme was concluded and preparations made for returning home next day.

SPECIFICATION WRITING.

(Concluded from last week.)

Tinner.—(Refer to General Clauses.)

Roofing.—Flat joint? standing groove? cleated? tinned nails. Quality of tin, branded? IC? IX? painted? what kind of paint? paper under, what quality and make, trade thickness. Flashings: continuous, width; broken? sizes, around chimneys, nailed? bonneted? Around skylights, carried up under galvanised iron or under sashes, if wood. Trap-doors, up rim, tacked to top edge, over scuttle down sides of rim. Gutter-strips: Twenty-inch tin, same quality as roof, brought once over edge of strip, tacked, paper under, same as roofing. Cut for rain-conductors. Eaves-troughs: quality tin? bead-edges? hung level? hung with grade? kind of hangers. Rain-conductors: kind, size, quality, trade thickness, connect with gutters, wire-balls; do conductors connect with terra-cotta pipe or discharge on ground? proper shoes.

Heat-boxes.—Quality tin, bright tin, cleated, stayed, sizes, collars for registers, for heater-pipes, for radiator-boxes, asbestos paper around studs, wire-lathing over boxes, dampers, boxes double?

Registers.—Does tinner supply or does plasterer or heater-contractor? kind, sizes.

Tin Shingles.—Any particular make? painted two coats when on.

Plasterer.—(Refer to General Clauses.)

Lathing.—White pine? spruce? hemlock? free from bark, sap. Wire-lathing?—stiffened? Other lathings: dovetail iron? expanded metal? Are outside walls stripped? Wire-lathing over heat-boxes, or does tinner do this?

Mortar.—Lime, any make? Sand, for brown coat? bar? road? creek? bank? screening? Hair, cow's hair, fresh. Run mortar two weeks before using.

Kind of Plastering.—Two coat? slip coat? three coat? with scratch coat, brown coat and finish coat? white coat? white sand. Sand float? white sand? Lath and brown coat cellar ceiling. Plastering free from cracks, blisters, wind, marks of float. Must stop, or is heat provided in cold weather? Who provides heat? does plasterer set registers? crocks for stove-pipes with caps and setting.

Ornamental Plastering.—Cornices—enriched? centre-pieces? panels? moulded? enriched? coved ceilings? Arches or arch moulds? soffits?

Patent Plasters.—What kind? make? guarantee.

Fire-protection.—Over beams, over columns, woodwork, what kind?

Galvanised Iron.—(Refer to General Clauses.)

Cornices, crestings, finials. Weight of iron or No. gauge; painted before setting inside and outside. What paint?

Skylights.—Hyatt's patent? ventilating? condensing? glass? does painter supply? ventilators, attachments for handling, rods, levers, cams, shafts, cog-connections. Show shapes on drawings; flat? pitched one way? hipped? gabled?

Roofer.—(Refer to General Clauses.)

Tin roof, under "Tinner."

Slate.—Quality, quarry, sizes, colour, grade, weathering. Tinned-nails, two to each slate, double at eaves, blind hips and ridges, cemented? snow-guards?—wire, at each joint, or other form of guard?

Tiles.—Kind, quality, bedded in hair-mortar? copper nails? copper wire? pattern, shapes, colour. Any conical roofs? special tiles. Tile-crestings, hip-rolls.

Tin Shingles.—Make. See "Tinner."

Iron-worker.—(Refer to General Clauses.)

Stirrups, joist-sockets, bolts, rods, washers, shoes for trusses, upset ends, anchor rods and plates, straining-rods, bearing bars for openings. Iron carpet-strips, iron-bricks for screwing on to. Manhole rims and caps, cellar-gratings, window-bars, grilles, painted; patent process? Store-gratings, galvanised? with hasps? padlocks? Pavement hoist doors, cellarway doors, with glass? brass-hinges? Archimedean-lifts for cellar-doors? Iron-stairs:—rails, posts, iron-treads, risers, rubber-tops? marble or slate treads and risers? in cut stone? Steel-beams:—lengths, widths, weight, angle-plates, connections, bolts, rivets, for floors, to have bearing-plates, painted before setting. Columns, cast:—thickness, bore for test, planed tops, bottoms, caps, bases—loose? drilled for bolts. Columns, wrought:—kind, make, length, required strength. Brackets, struts, wrought? cast? for bolts? cornice-rods. Clean-out

doors. Ash-pit doors. Fireproof doors, vault-doors, no burglar-proof—give all dimensions, thicknesses, fastening. Iron-shutters:—lugs for hinges? built-in? open from inside? open from outside? Wrought window-frames? sash? sills outside? heads outside? Iron-trusses refer to details, separate specifications. For trusses, contractor submit drawings. Chimney-stack cap—cast-iron? wrought-iron? bolted? Expansion-bolts. Fire-escapes? Iron-gates, railings. Harness-hooks. Feed-boxes, steel-wrought? cast-iron? Iron-mangers: cast? wrought? Water-troughs: This specified elsewhere. Stall-guards: wire galvanised? cast-iron? wrought-iron? Heavy-wrought strap-hinges, special?

Painter, Glazier.—(Refer to General Clauses.)

Old Work.—Burn off? wash off? sandpaper? Putty-stopping nail holes, cracks. Shellac-stopping knots, sap.

Painting.—To sandpaper woodwork. Priming. Three coats paint. How many colours tints? What kind of paint: mixed or ground? what lead? any zinc? what colours? any make? all paint to have white-lead body? any ready-mixed paints? what make? Ironwork painted? how many coats? China gloss-painting? how many coats? Enamel-paints: on tub? on walls? Paint to be gloss finish? paint to be dull finish? painter to protect floors, stonework, &c., while painting.

Natural-wood.—Varnish: any particular make? how many coats? Rub each coat. Finish: full gloss? dull polish? egg-shell finish? floors varnished? or wax finished? Stained: what colour? Putty-stopping, coloured to match wood. Shingles stained: what make of stain? what colour and number? Porch floors painted? Porch ceilings painted or varnished? Walls or ceilings painted? sized? how many coats? colours?

Glazing.—Any floor-lights? rough-plate? how thick? Any skylight glass? rough-plate? how thick? In galvanised-iron specification? Plate-glass, specify windows, American? French? American cylinder-glass, double strength, what grade? single strength. Chances crystal sheet? French crystal? Ground-glass? Obscured glass? Glazed doors—specify. Inside windows. Stained-glass? leaded? specify price per foot? omit? lump sum?

Heater.—(Refer to General Clauses.)

Hot-air.—Name make of heater? bricked in? who does it? Portable? Specify size, or make contractor guarantee and leave size to him. Cold-air duct: brick? wood? terra-cotta pipe? from separate opening? if so, see that it shows on plan: from cellar-window? see that carpenter boxes in and sets sash. Does carpenter make box? Bright tin-pipes to flues: size, or leave to contractor if he guarantees. Dampers. Registers: if not, where, tin-flues? if not, who? If contractor guarantees, have flue sizes approved by him. Heater should have shaking-grate, Merston or approved, automatic-damper, water-tank. All wrought-steel? All cast-iron? no combination. Galvanised iron smoke-pipe, give thickness in trade term.

Hot-air and Steam Combined.—Name make. All other specification like hot-air, for hot-air, and steam for steam. Galvanised smoke-pipe, give thickness trade term.

Steam.—Name heater, or contractor guarantee. Cast-iron sectional? wrought-iron? bricked in or not? Automatic-damper, shaking-grate, safety-valve, steam-gauge, water-gauges. Blow-off cock, into cellar? into well? not permitted in sewer. Direct? what make of radiator? automatic air-valves nickel? wood-handle nickel-plated valves? Jenkins Bros.? nickel bushings in floors. Radiators bronzed? painted? pipes bronzed? painted? Direct-indirect? same specification as direct, but specify, radiator to be box-radiator, or "direct-indirect"—and specify, galvanised casings to outside air, through walls, provide gratings, or from cellar on first floor. If from cellar, provide cold-air ducts from cellar window, galvanised iron, say twenty-two gauge. Indirect: name radiator; air-valves automatic, brass-seat valves? Jenkins Bros.? radiators hung from joists? on proper irons? Cold-air supply: galvanised iron, name thickness, flat-ducts, curved angles, duct to open through wall; if so, see that opening is shown on plan. Radiator-boxes, same galvanised iron, put together with bolts or pins, to come down, roofs of boxes, pine, tin-covered. Does contractor provide flues? registers? or are they in other trades? if so, what trades? Guarantee invariable. Written, sealed, to 70 deg. in zero weather—also against water-hammer in pipes, not over ten pounds of steam to be necessary to heat. Or does contractor provide specifications with bid under same guarantee. Any hot-water heaters? coil? Large plants, with extended work, fans, pressure or exhaust, special expert specifications. Steam-heat from power-boilers, reducing-valves, to heat system, return-pipes to tank and pumps. Power-boilers: horizontal? tubular? upright? steel? Harrison safety? Babcock & Wilcox, safety? All to be tested to carry one hundred pounds, special work more. Boiler Insurance Company's certificate to be delivered to owner. Engines: take specifications and guarantee from bidders. Refer to experts.

Electrical Work.—(Refer to General Clauses.)

Special Specifications.—Refer to Underwriters' Association. Make contracts subject to inspection approval of Association and observance of all rules of Insurance Company.

Dynamos.—Special specification. Call-bells, annunciators, buttons, pulls, batteries, wire insulated, run in tin tubes. Kind of buttons, as to finish. Pull at front door to match furniture. Annunciator to have names of rooms, &c. Hotel annunciator: take maker's specification.

Lifts.—Hydraulic? electric? direct steam? city water pressure hydraulic? name maker; Ellithorpe safety-cushion other safety-brakes? Does contractor furnish car? Own design? Your design? Gas to car? electricity to car? annunciator and buttons. Does contractor furnish? Electric-stop and start, safety? method of control, rope? winch? lever? guides, wood? iron? machinery, take maker's specification. Refer to expert. Guarantee to cover speed and durability. Require insurance and inspection from insurance company.

Hand-hoists.—Require specifications from makers. Guides at back? at all corners? at two corners? friction and ratchet safety-brakes, hatch-way doors? automatic bars? brake and rope through storeys.

Carriage-hoists.—Same. Friction automatic safety-brakes, brake and rope on band wheel.

Pavement-hoists.—Take maker's specifications, generally winch-hoists, chain-cables.

GENERAL.

Mr. Henry Hartley, president, will deliver the opening address at the meeting of the Liverpool Architectural Society on Monday, the 8th inst. Mr. F. M. Simpson, professor of architecture, Liverpool University, will subsequently give an address.

The Practice of Mr. Grierson, architect, of Bangor, whose decease we lately recorded, has been obtained by Mr. Frank Bellis, of Mold. Mr. Bellis was for eight years with Messrs. Douglas & Fordham, architects, Chester, as pupil and assistant.

The Roll of the Institution of Civil Engineers, corrected to September 6, 1894, shows that there were then on the books 19 honorary members, 1,837 members, 3,597 Associate members and 358 Associates, altogether 5,811. There is also a class of students attached to the Institution, but not forming part of the Corporation, which now numbers 782.

Mr. P. Shearson Gregory, architect, Bangor, and diocesan surveyor, has been engaged by Sir R. W. Bulkeley as architect for the Baron Hill Estates.

Mr. J. S. Sargent has completed portraits of Mr. Coventry Patmore, the poet, and Mrs. Wilfrid Meynell, the poetess.

Archdeacon Farrar gave a lecture in Rome on Monday evening on "The Development of Christian Art."

M. A. M. Castel, landowner in the Seine-et-Marne district, has, it is stated, discovered on his estate at Esmans traces of the Roman road from Sens to Lutetia.

The Vicar of Cardiff, it is stated, is asking for money to help forward the excavation of a Roman villa built over the remains of prehistoric dwellings in the neighbourhood.

The Burlington Fine Arts Club propose holding an exhibition of Egyptian art and antiquities in the spring of next year. The committee of arrangement has been promised contributions by well-known collectors, but there are many persons possessing collections or single objects of interest who may not be personally known to the members of the committee. The committee would doubtless be happy to receive any communication relating to such collections or objects from their possessors.

Professor Banister Fletcher, F.R.I.B.A., is actively engaged in preparing a complete abstract of the new "London Building Act," and it will shortly be published by Mr. Batsford.

Mr. G. C. Vernon Inkpen has been instructed to prepare designs for a new laundry for the Portsea Island Board of Guardians.

Mr. Harold Busbridge, A.R.C.S., of the Metropolitan Drawing Classes, who was last year elected a member of the Sanitary Institute, has been appointed principal lecturer in building construction, carpentry and joinery and brickwork and masonry at the Goldsmiths' Company's Technical and Recreative Institute, New Cross, under the direction of Mr. W. J. Lineham, M.I.M.E. Special classes for elementary, advanced and honours building construction will be held during the current session, and practical workshop instruction in brick cutting by Mr. W. J. Goodwin, carpentry by Mr. G. Allworth, and plumbing by Messrs. J. W. Hart and D. Early, R.P.C., will also be given. Artisans and apprentices are admitted to these classes at half the usual fees.

The Architect.

THE WEEK.

FROM his numerous and generally successful efforts to reconcile differences between capital and labour, Sir RUPERT KETTLE made the country his debtor. His name would suggest he was of Anglo-Saxon race, but he was of a French family, a descendant of one QUETEL, or QUESTEL, who fled from Meaux after the Revocation of Nantes, and set up glass-staining in Wolverhampton. There the late Sir RUPERT was born in 1817; he was educated in the local grammar school and apprenticed to a local solicitor. But like the present Lord Chief Justice and other eminent lawyers he was attracted to the Bar, and after his call in 1845 he obtained a valuable practice at quarter sessions. In 1859 he was appointed judge of the Worcestershire County Courts. Afterwards he was elected chairman of the Court of Quarter Sessions for Staffordshire. He held many local posts. Sir RUPERT'S experience in the Midlands, his acquaintance with the various industries, and his reputation as an upright judge made him an ideal arbitrator between employers and employed. His first success was gained in 1865, when he settled a difference between the builders of Wolverhampton and the carpenters and joiners. He drew up a code of rules which both sides accepted. Afterwards there was a dispute about the meaning of a clause by which extra payment was to be allowed for working on unprotected buildings in winter, and his interpretation of it in the men's favour was at once accepted by the masters. On other occasions he was called on to arbitrate in the building trades of Wolverhampton, and the gratitude of the parties was expressed in two illuminated addresses which were presented to him. Many industries invoked the exercise of his judicial impartiality, and as a peacemaker in industrial troubles his value was priceless. His unbought equity must have prevented the loss of millions of money in obviating or shortening industrial commotions. He helped to form conciliation and arbitration boards which have rendered many services to the State, although we suppose modern trades unionism would look on them as obsolete. He received his knighthood in 1886, and the honour was never more worthily earned by a civilian. It is to be regretted we have not more men of Sir RUPERT KETTLE'S character, who devote their lives to most difficult tasks for the public welfare without assuming any of the airs of the professional philanthropist.

THAT architecture is better appreciated in Liverpool than formerly is evident not only from the arrangements for the architectural professorship, but from the collection of books relating to the art which has been acquired from time to time for use in the public library. There are already upwards of a thousand books (exclusive of those relating to construction), but the number is no test. Many most costly works are to be found among them. Their excellence is due in no small measure to the extensive knowledge of the subject possessed by the late chairman of the committee, Sir JAMES A. PICTON. A catalogue of them has been issued in order that the students of the newly-founded architectural school may at once be made acquainted with the books at their disposal and reap the full advantages which such literary wealth confers. The books in the library on interior decoration of buildings (including mural and ceiling paintings, stained-glass windows, mosaic pavements, &c.) are reserved for a later list dealing with the decorative arts in general. The topographical and antiquarian books possessed by the library also contain many views of buildings.

ANOTHER architect has been made to feel the precariousness of public offices in America. Mr. JEREMIAH O'ROURKE held the appointment of supervising architect over all Government buildings, and judging by his action when dealing with the unofficial architects who were eager to compete for public buildings, it might be considered as if his loyalty to the State overcame *esprit de corps*. On

September 17, Mr. O'ROURKE was amazed, as he well might be, when he received from the Secretary of State a request for his resignation. He at once wrote back, recalling a promise that if accusations were made against him (as was the case with many of his predecessors) he was to be heard. He solicited the performance of the promise. Mr. O'ROURKE, in his letter about his office, said:—"I know that I have made enemies in my endeavour to raise it to a higher plane of professional tone and integrity than it has hitherto occupied in the Treasury Department. I am well aware of the dishonest, untruthful and bigoted conspiracy which has persistently worked against me for months past, and I should have exposed its machinations to you had I the slightest idea it would influence your judgment or your action." The Secretary in reply said his action was not due to accusations, but to his own observation of the want of system and harmony in the architect's office. Mr. O'ROURKE was accordingly bound to resign. He claimed to be one of the comparatively few educated and trained architects in the States, and therefore should be competent to understand office routine. But he says that some of his subordinates who were not architects, and have had little contact with the purely business incidents of an architect's office, considered they were better able to judge than himself, and it is to their complaints and criticisms he ascribes the alleged want of system and harmony. The unofficial architects will of course believe that NEMESIS has been pursuing Mr. JEREMIAH O'ROURKE.

WHEN the tenders were sent in for the reconstruction of Glasgow Bridge, it was found that if foreign stone were used instead of Scottish granite, there would be a large saving. In consequence of the outcry which followed no action was taken. Once more tenders are invited for the work. As some compensation to the contractors whose tendering was fruitless, it has been decided that if they will again try for the work, copies of the quantities will be supplied to them gratuitously.

SOME members of the Ipswich Board of Guardians have been visiting various workhouses with the view of collecting data to enable the Guardians to decide upon the accommodation, &c. to be provided in the new workhouse which is to be built near the junction of the Woodbridge and Spring Roads. They consider that for a small workhouse suitable to the requirements of Ipswich, the system in vogue twenty years ago was on the whole more satisfactory, but as to the infirmary accommodation they believe it would be better to base their decision on the more modern models. The committee considered it was important that the architect entrusted with the preparation of plans should possess special knowledge of this class of work. To this suggestion one of the Guardians on Friday last took exception, as he considered it was unfair to the Ipswich architects, among whom were plenty of men of ability, and capable of carrying out a scheme like the one in question. Other Guardians said they were not to be influenced by false sentiment, especially as the Local Government Board believed that special knowledge was necessary to the successful accomplishment of such a work. The report was received, together with the committee's suggestion about obtaining a specialist as the architect, only two members opposing the resolution.

A COMMUNICATION from M. HOMOLLE, the director of the French School at Athens, respecting the second hymn to APOLLO which was found at Delphi, was read at the last meeting of the French Academy of Inscriptions. He attaches the greatest importance to the discovery, as the marble slab furnishes not only the melody for the singers, but an accompaniment as well. The relation between the vocal and instrumental parts has yet to be determined, and M. HOMOLLE anticipates that he will be able to do so, as the engraving is in a fairly perfect condition. There is accordingly a possibility of settling the old controversy about the skill of the Greeks in harmony. The hymn does not appear to belong to the most advanced period of Greek art, for it is supposed to date from about two centuries before our era; but whatever its age, there can be no question it is of more importance than the first hymn to the god.

THE AMALGAMATION OF LONDON.

THERE are few men who are compelled through their own interests to be more attentive to the government of a city than architects. Amenities and administration are closely connected, for where the latter is weak the streets are not likely to be of a character which will aid in enhancing the appearance of buildings. No apology is therefore needed for treating the report of the Royal Commission on the amalgamation of the City and the County of London in columns which are usually occupied with subjects that are specifically technical.

The report seems to us in the first place to be almost unique in its character. In documents of the kind which propose changes of an infinitely less revolutionary character, reasons are given to explain the urgency and the justice of the contemplated action. But in the report that sort of treatment is not considered necessary. A foreigner who would be curious to know what was done by the citizens of London to deserve the punishment of a loss of their ancient privileges, will discover that the pages of the report furnish him with no information. The Royal Commissioners appear to be as much in the dark on the subject as any of the members of the Corporation. All they can say is "That such an amalgamation is desirable if it is practicable we understand to be assumed in the terms of the reference to us." And as if there was no obligation on them or anybody else to inquire why, after so many centuries of existence, the City should not meekly submit to annihilation, they express surprise because its representative on the Commission was curious about the defects in the government of the City which could only be remedied by amalgamation. This assumption, they say, "did not command the assent of our late colleague, Mr. H. HOMEWOOD CRAWFORD, the City solicitor, and he and those who represented the City before us as witnesses protested against their appearance on or before the Commission being regarded as an admission that the amalgamation was desirable. Ultimately the witnesses withdrew, and Mr. CRAWFORD himself retired from the Commission." As far as we can see there was no other course open to them. A comedy which was to exceed the ancient performances of the Jedburgh justices in its absurdity was about to be enacted, and the accused could not be expected to acquiesce in procedure which would not be tolerated in any magistrates' court.

For it cannot be too clearly remembered that in the present case everything depends on allegations being taken for granted without proof. There is not a jot of evidence to show that the inhabitants of London are discontented with their lot, or that their privileges are upheld by encroachments on the rights of their neighbours in the surrounding Metropolis. The Commissioners admit that of all the old customs of the City, those alone which have any importance appear to be the "market overt" and "foreign attachment." The latter, they say, "is practically obsolete, as a recent decision of the House of Lords has rendered it necessary to observe the custom in the letter, and modern conditions of commerce make it almost impossible to do this." Whether the custom of market overt should cease, or be extended throughout the proposed amalgamated city, the Commissioners cannot determine, a sufficient proof it is not the chief source of profit in Cheapside or Lombard Street. It is also said that the possession of market rights and powers as to foreign cattle and the port sanitary authority affect the whole administrative county of London, but the Commissioners do not venture to say the consequences are injurious in the Metropolis or its suburbs. The Commissioners must know the weakness of conclusions which are not supported by valid evidence, and, if it were possible, they would at least allude to the abuses of which London was the cause, if any were to be found. Their references to foreign attachment and market overt make it plain that the Metropolis does not suffer much evil from the City. Indeed, we might say that if the project of amalgamation had to depend on the testimony of inhabitants of the inner or outer parts of the Metropolis who have in any way suffered from the dual government, it would quickly vanish. It may, therefore, be admitted that at the present time the interests of any inhabitant who is under the charge of the London County Council is as little affected in any way that is damaging to

his worldly concerns by the Lord Mayor, Aldermen, Council and Liverymen of the City as by the bewildered authorities of Pekin.

Let us take another view of the case. Everybody knows that at one time the construction of great thoroughfares connecting the extremities of the Metropolis did not find much favour. Many of the roads were laid down in the direction of the City, as if the Bank were the central point aimed at, but the continuity was broken when the boundaries of the City were reached. One reason was that, the area which the Corporation controlled was so limited there was no space for many vast thoroughfares. That, however, may be admitted to be an inconvenience. In the same way a system of main drainage could not be complete if the eastern and western districts were kept apart by the intervention of the City, and that also holds true in respect of lighting, fire protection, utilisation of electricity, &c. For a long time, however, that sort of grievance has ceased to exist. The County Council in all operations relating to main sewers, main roads, street formation, lines of frontage, overhead wires, embankments and prevention of floods, &c., have supreme authority within the jurisdiction of the Lord Mayor. There are many architects who have desired to see the City in possession of a separate Building Act, for they were confident it would be carried out with more respect for design than was tolerated in the Metropolis, but the new Act, like its predecessor, with the exception of a few reservations that could not be avoided, has to be obeyed within the City equally with Westminster. The functions exercised by the City Council in such affairs as infant life protection, shop hours, weights and measures, storage of petroleum, coroners, testing weights and measures, are not likely to be discharged less efficiently by the officers of the Corporation than by those of the County Council.

The City has, however, one defect, inasmuch as it is an obstacle alike to those who believe in the virtues of centralisation and those who, like Mr. JOHN BURNS, believe in "the wonderful potentiality of municipal life" as an agency of socialism. In a country like ours, where parliamentary and civic governments have an uncertain duration, the permanent officials exercise an excessive if invisible influence. To their minds living beings become identified with arithmetical figures, and as it is as easy for them to deal with millions as with thousands, they naturally prefer the former, as being more impressive, and giving a truer notion of their authority. The arrangements with the City add a little to the labours of Spring Gardens, and accordingly there is an agency created which is unfavourable to the Guildhall. The County Councillors have their own grievances. In spite of the statistics, which demonstrate that the City has only a population of 38,000 and a rateable value of four millions, while the County of London outside is valued at twenty-nine millions and has a population of over 4,000,000, the world in general prefers the place which appears more insignificant on paper. Sixty years ago a body of Commissioners who were appointed to report on London were obliged to own that "they were unable to discover any circumstance justifying the distinction of the small area within the municipal boundaries from the rest, except that, in fact, it was and had long been so distinguished." The latest Commissioners appear to have arrived at a similar conclusion. But is not the fact a revelation of peculiar merit? The City could not for ages be distinguished unless there was something exceptional in its administration. London was the least picturesque of cities, yet at the time when it was described in a Paving Act as "very foul and full of pits and sloughs, very perilous and noxious as well for all the king's subjects on horseback as on foot," it was an emporium for foreign trade, and a great part of the wealth of Europe was entrusted to its warehouses. It has been accepted as representing English security, and there is no doubt that the value which is attached to England throughout the world is largely derived from a conviction of the stability of the City. Confidence is of slow growth among men, and especially among strangers. Are we wise to risk it in the case of London by acts which will persuade the world that the City owes its distinction to false pretences which have been going on for centuries, and that in reality it is merely a small district on a level with places which are

only known to the residents? We have no desire to say one word against the respectable gentlemen who form the Amalgamating Commission, but when we find them proposing a reorganisation of the police of the City in order that it may correspond with the watchmen in provincial towns, thus bringing a saving at the most of 50,000*l.* a year, it is evident they are unconscious of the conditions which have attracted so much of the world's wealth to one small spot. It sounds well in theory to say let "banks, docks, railway companies and other institutions pay for their own special police," although not so well as to say under County Council management police will not be needed within the City boundaries. People who possess wealth are not likely to trust it to a place where protection would be left to chance, or offered in as weak a condition as is proposed for the sake of economy.

But we must admit that the Commissioners do not express any faith in the success of their proposals about the police or the majority of the other subjects. As they entered on their task without any conviction of its necessity they appear to be no less indifferent about the effect of their schemes. On one point alone do they display a little confidence—it is in the amalgamation of the offices of Lord Mayor and Chairman of the County Council. "We may look," they say, "for the maintenance in the future of all the useful and many of the stately traditions of the past, and in particular the Lord Mayor may be trusted to represent before the world the great community of which he is the head with the splendour becoming his position." If that end is not attainable except by the unsettling of the City it would be better to imitate the legendary Brentford precedent and have two Lords Mayor of London. The importance attached by the Commissioners to ceremonial functions suggests that amalgamation is in their minds a woman's question rather than one of good government.

RENAISSANCE GLASS.*

ACCORDING to HEINRICH HEINE, the interior of a Mediæval cathedral resembles a hollow cross, in which all things are suggestive of martyrdoms, the red and green lights of the windows denoting the blood and pus of the sufferers. Everybody will not accept that view, although it expresses the opinion of a great genius whose life was one of suffering and who was as sensitive to religious emotions as any of his race. It suggests, however, the belief which was not confined to HEINE, that the early and best examples of painted glass were not intended merely to allow of "a dim religious light." They expressed by their peculiarities the mystery which all religious people accepted as a condition of life, and they inspired hope, as if they were means of communication between worshippers in a church and Paradise. If the æolian harp had been known to the Mediæval clergy (some people say it was invented by a Jesuit in the seventeenth century, while others believe it was employed by DAVID when a shepherd) we may be sure they would have utilised it with the same object. But one of the consequences of the law of development was that the influence of "Blutstropfen und Eiter" was to diminish. Daily executions and torturings made representations of martyrdoms appear commonplace. The world and its desires had also gained more hold on the Church. Hence it was, as HEINE maintains, that Pope LEO X. was as influential an agent in the Reformation as LUTHER himself, and the protests in stone, colour and rhyme by the Renaissance artists and poets which were inspired by the Vatican were as effective in their way as the Wittemberg theses.

The concluding volume of "The History of Design in Painted Glass," on which Mr. WESTLAKE has been engaged for nearly forty years, treats of the work of the sixteenth and seventeenth centuries, and reveals the transformation of religious thought. The symbolism of the old glass painters was no longer approved. The windows were made to resemble pictures on canvas or wood. There seemed to be little difficulty in having one's portrait set up for the sun to stream through, or, what was more satis-

factory, in posing as an ecclesiastical figure arrayed in the richest of vestments. If there was a loss in the abandonment of the Mediæval *naïveté*, there were many gains. It is impossible to say whether many Mediæval windows exemplify the full powers of the artists. The men appear sometimes to have been fettered, as it were, by the conviction that the fullest exercise of their talent would be a delight that was sinful. In the sixteenth century there was freedom, and the glass often has a magic beauty which purists and sticklers for Mediæval propriety cannot resist. Mr. WESTLAKE in treating of the subject has a more difficult task than falls on amateurs when describing Renaissance glass. As an artist he is bound to uphold principles, and cannot be indifferent to the conduct of the artists when they "introduced the fashions foreign to the purposes of the art, and by the use of adventitious and accidental aids and embellishments eventually swamped its essential character and original traditions." But he recognises the manipulative skill that is manifest in the innovations and endeavours to do justice to the offenders.

Successful painters were not above giving designs for glass painting in the sixteenth century, as well as for tapestry and other productions. The co-operation helped to break down the barriers which separated the arts of representation. One of the effects was the renunciation of many of the conventions which imparted character to the glass of the preceding period. An example may be given in Mr. WESTWOOD's words:—

The most marked characteristic of the early sixteenth-century design, in certain instances, was the gradual abandonment of canopies; the pictures or subjects were very frequently placed in the openings without any ornamental surroundings or accessory work. One may suppose that this resulted from the somewhat crude species of reasoning still often used against accessory work in the present day; such, for example, as "There is no canopy-work in nature," "Abel was not killed in a centre of canopy-work," &c. Those who use this assertive species of argument may be answered (taking an analogy from a picture exhibition) in their own method, by the assertions that "Gold frames do not occur in nature," and that "Abel was not killed in ormolu surroundings." Reasoning on matters of taste requires to be most carefully applied. We may lay at its door much of the mischief that was rife in art at this period. Even in our own day it is not innocent; and often, when applied in certain ways, it arrests that continual progress and development that successors in workmanship would achieve if left to traditional ideas. There is, however, little need of a long argument on a question of taste. It certainly improves the appearance of a building in which glass is inserted if there is some work surrounding the picture, which leads it towards and into the stone or marble-work; and if this accessorial work is sometimes similar, although the repetition be not exact in each opening, it harmonises the whole. It is the only part of the design that can be repeated, and the value of repetition in composition has been so frequently proved elsewhere that I need not burden these pages with the argument. The sixteenth century was, however, a period, especially in its later years, when traditions were disregarded and every old practice was questioned. When the pictures are small and numerous in large openings, very little accessory work is necessary to harmonise them. In subjects of larger size it appears to me to be invariably required in some quantity; but in very large windows filled with large picture-work, as in some of the latest of those at Gouda, it fails to be of any service. As both ornament and figure lose their proportion in the church, they swamp and destroy all the other art and architectural details of the building.

The last words indicate that Mr. WESTLAKE believes in the principle that all decoration of a building, whether mural painting or glass painting, mosaics, tiles, &c. should be made to appear as subservient to the architecture and expressive of its supremacy. The Renaissance decorators found the principle was less easy to accept than their successors. From their versatility they could practise all the arts, and therefore could hardly have had much preference for any one of them except what arose from financial considerations. It was hard on a man who loved painting and sculpture to make architecture more prominent, and consequently many of the Renaissance examples are dangerous to follow.

There were other departures from Mediæval ways which Mr. WESTLAKE explains. The heads were sometimes taken from comely individuals, but by a perversity, as coarse models as any Dutch painters would admire were also utilised by the glass painters. "Our Lady of Pain" was superseded, and there are examples which reveal a strange want of sympathy with everything that was not earthly. In some kinds of drapery there could not be much variation from old types which seemed to be asso-

* A History of Design in Painted Glass. By N. H. J. Westlake, F.S.A. Vol. IV. London and Oxford: James Parker & Co.

ciated with Christianity, but the robes became more ample. Nothing, however, was more subversive of tradition than the want of appreciation of outline, which was like a bequest from Egyptian art. "The artists of the period," says Mr. WESTLAKE, "generally abandoned the outline as a principle, except where it was absolutely impossible to do so, as in profile forms, in assisting shadows, or in the darker parts; and they aimed at expressing the forms by more elaborate modelling, shadowing and chiaroscuro, all of which, notwithstanding their great temporary success, were destroying at least one of the qualities of the material." The tendency to compete with the painter in oils or tempera was the cause which introduced also innovations in the handling, and an elaborateness was common which might be considered unnecessary in works that were generally at a distance which did not permit close examination. On this subject Mr. WESTLAKE offers the following excellent remarks:—

The method of manipulation appears to have been as follows:—The pigments and flux were ground exceedingly fine, then mixed in water with some slight adhesive substance, such as gum in a very small quantity. The very dark touches, such as those for eyes, eyebrows, nose shadows, the mouth, &c., were sketched in, and the glass was burnt. On being cooled it was placed on an easel, and the pigment was floated over the surface of the glass, the lights and shadows being expressed by more pigment being floated into the shadows, according to their depths; a slight dabbing or stippling was sometimes used, but more generally dispensed with. For the strongest shadows dark patchings or dark black touches were skilfully used in work intended to be placed at a distance, and they gave a good effect. The colour, when dry, was again worked upon, the high lights being heightened by a dry brush passed over them, or scratched out by a needle point. The stronger shadows were sometimes etched over again with lines, and the dark touches strengthened. It was then reburnt. In some of the later work, especially in the seventeenth century, it was still more worked upon and obscured, and some essential oil, instead of water, was mixed with the finishing pigment to keep it soft in effect. This soft or smooth shadow is more obscure than that appearing rough, as the grains of the pigment lie closer together. All the draperies and ornamental portions are painted in the same way, except that the clearing out of the lights is often done in a broader and bolder manner.

The extracts will enable our readers to realise the practical character of the information which is given in the first part of the book. Mr. WESTLAKE, as an artist, is able to understand all that was done to insure effect, and his discoveries are not treated as trade secrets.

Mr. WESTLAKE next treats of the English and continental examples, as it were, individually. His descriptions are full of detail, and with the aid of the numerous illustrations will enable the reader to realise the character of the windows and to imagine their colour effects. No pains have been spared in utilising all available means for arriving at the history of the works, and the pages will therefore be found as interesting to the archæologist as to the architect or the artist. The work has been in preparation, as we have said, for nearly forty years, and nobody will be surprised who considers the extraordinary amount of particulars which are introduced in the four volumes. The letterpress resembles one of the old windows, which might be designed by one effort of the will, but to execute it patient toil was needed in adding one small part to another, and no endeavour to imitate TINTORET in his fury or MICHEL ANGELO, when he said quick work was good work, will avail. The art of glass painting can only be described in a satisfactory way when much time as well as labour is given to the preparation of materials.

Although the sixteenth and seventeenth centuries were times of commotion in England, it is surprising how much painted glass of that date is noticed in Mr. WESTLAKE's last volume. Winchester Cathedral, Malvern Priory, York Cathedral, the Chapel of Henry VII., King's College Chapel, Cambridge (where "we see the work of the last of the great 'glaziers,' whose religious art was fostered by the clergy and patronised by the court and royalty of England"), Bury St. Edmunds, Basingstoke Chapel, the Oratory at the Vyne, near Basingstoke; St. Margaret's, Westminster; Queen's College Chapel, Oxford; Balliol College, Oxford, and St. Neot's, Cornwall, present examples which Mr. WESTLAKE maintains are English work. In addition there are buildings containing foreign glass. The most interesting examples of glass in France, Belgium, Holland, Germany, Italy and Spain, are described with no less affection and ability.

THE EXTERNAL COLOUR DECORATION OF BUILDINGS.*

AMONGST the many considerations suggested by the works of the old masters in art, there is one concerning the external decoration of houses which leads to the inquiries, Why is it that to-day when the words "old masters" are on the lips of all, when we consult and study them that we do not take examples from the various methods that they had of externally decorating their edifices with such beautiful effect? and why do not we also unite colouring with architecture? Colour does not disturb form in any way; in fact, when colour is well conceived it greatly helps to bring out the full beauty of form. The Assyrian art, the Egyptian, Greek, Roman, Arabian, Gothic, and finally, the art of the fifteenth century, entered into the decoration of innumerable edifices of great importance, some with monochrome colours and some in polychrome; whilst we, with few exceptions, when we want to do something above the ordinary level, generally resort simply to the usual terra-cotta or stone of uniform colour and to very little else.

We must, however, here note that in spite of the general similarity of the external decorations of the present age, we see in them from time to time a tendency to more closely study the old masters, and we notice a certain revival of old ideas of great artistic value relating to external decorations in colour.

There is much that could be said about the art of uniting colour with architecture in the Greek and Roman periods, but the time is too limited on this occasion to attempt to cover so extensive a field. I will, therefore, limit myself to a few remarks about the methods adopted by the fifteenth-century artists for adding beauty and variety to their edifices. I ought also to say that amongst the many and varied styles of external decoration of the different artistic periods in different countries, that used by the fifteenth-century masters, which lends itself so particularly to our requirements, greatly surpassed every other style of decoration which had up to that period been used. What have we, it may be asked, more beautiful in external decoration than the immortal majolica of the Della Robbia and the graffitos, chiaroscuros and frescoes of Polidoro da Caravaggio, Pellegrino da Bologna, Maturino Fiorentino, Giulio Romano and Raphael? These artists who possessed such refined taste covered many and many external walls of houses and palaces which for the proportions of the windows, the elegance of the columns and that of the cornices, have excited immense admiration, and yet those beautiful and various decorations, framed as it may be said by the surrounding elements of architecture, have hardly been considered worthy of study except in very rare cases.

Rome, Florence, Venice and many other principal and secondary cities of Italy can give innumerable examples of the beautiful art of external decoration, which in virtue of the material used and the mode in which the work was done, have endured through many centuries, as well as the architectural stone-work which encloses them.

However, we must note that in those golden times the term decorator conveyed something more elevated and noble than it is frequently understood to mean to-day. In fact, in the past a Michel Angelo, a Raphael, a Cellini, were embraced in the title of decorator. Whereas in these days it is rarely that we see a work of industrial art executed by an artist of high reputation, as there seems to be a prejudice against such work. Why then do we not entirely abolish this prejudice? Why do not artists who have great names and those who have not return to those good and wise traditions of the old times? What variety, what elegance of effect might be added to the many houses that are now being constructed with so much good architectural taste if there were introduced in some or all of the blank spaces decorations of majolica, graffito, chiaroscuro or fresco as in the fifteenth century?

Let us, however, now pass on to the principal methods of external decoration most used in that period, beginning with that of majolica.

Besides being extremely beautiful, the majolica decoration has the advantage of preserving the walls by preventing the penetration of moisture into the interior and thereby protecting in the same way both the owner's property and the occupiers' health. As is generally known external decoration in majolica is often seen in the southern climates, whereas in England, if used at all, it is chiefly for interiors. If we ought to believe in the old Latin saying "Utile dulci," majolica would hardly be selected for the internal decoration of dwelling-houses in cold climates, for, although in a certain sense it must be considered useful, it certainly would tend to discomfort indoors under ordinary circumstances during cold weather.

Externally, however, as already said, it protects the walls from rain, fog and dirt, presenting at the same time to the eye a magnificent and varied effect. We may imagine the effect of the front of a house well designed by the architect for the

* A paper by Cesare T. G. Formilli, read at the request of the committee of the Art Workers' Guild, London, on October 5, 1894.

application of majolica, having beautiful friezes, medallions, panels, &c., in this material and of truly artistic creation in the sober sense in which the old masters intended. A large frieze, as made by Luca, Giovanni or Andrea della Robbia, with spaces between the windows fitted with beautiful symbolical figures, representing, for example, scenes from family life, or fitted with scenes of child life, as Andrea fitted the famous medallions which decorate the space above the arches of the Hospital of the Innocents in Florence.

What beautiful and sublime external decoration is made by the five figures of Giovanni della Robbia, in Pistoia, namely, Faith, Hope, Charity, Prudence and Justice; also by the immortal frieze called "The Seven Works of Mercy," of which beautiful copies can be seen at South Kensington Museum, and which are good in any case as an inspiration in that class of external decoration. Not less important or beautiful are the medallions of the arms of the King of Anjou and the months of the year, both by Luca, and also found amongst the many treasures of the same museum.

It would be too long to enumerate the many examples of decoration in majolica by the Della Robbia family, who began with Michael, born about 1320, followed by Luca about 1399, by Andrea in 1435, and by Girolamo in 1488. Afterwards one branch of this family became almost French, and finished with Guido della Robbia, who did not reach the age of touching the clay, but died in 1625 at the age of only five years.

Another system of external decoration not less beautiful and well adapted to resist atmospheric changes is without doubt that of graffito, which was adopted with immense technical and artistic knowledge in the renaissance of Italian art.

Such decoration, whether it be for its weathering powers in severe climates or for the magnificent artistic and at the same time subdued effect which it produces to the eye, certainly merits being considered as beautiful as decoration in majolica.

On the Continent, and especially in Germany and Italy, the art of graffito is extensively used, but here in England many must regret that graffito decoration has been almost entirely neglected. It is difficult to account for this unless it is due to erroneous impressions that the English climate would injuriously affect the work, or that it may be too expensive for general application.

Regarding the cost, I need only say that it would compare favourably with any decoration, even if it were of the simplest description, in stone or terra-cotta.

As to the durability of graffito, it is, if properly executed, quite capable of resisting heat, frost and rain, because it presents a very hard surface and is much less porous than ordinary stones or bricks, whilst it lends itself to being easily washed, which is an advantage in foggy and smoky atmospheres. Of the very few examples of graffito existing in London, that which is at South Kensington, although not executed according to the method of real graffito, affords nevertheless good evidence that decorations of this character do not suffer materially from long exposure to atmospheric changes. If they are a little darker in tone than when they were executed, they still are perfectly distinct and without doubt of a finer tone and more harmonious than when done by the artist. Here I ought to add that the work just mentioned is cut much deeper than graffito as intended by the old masters in this art—masters to whom we ought to feel deeply grateful for having added this treasure to their already invaluable bequests.

Vasari wrote of the graffito of his day, and gave considerable information about it. He referred to it in words which may be translated as follows:—"Artists have another sort of art, which is called graffito, and serves for ornamenting the fronts of houses and palaces, which may be quickly decorated by such a system, and more surely resists the rain. Its durability is entirely due to the etching on the wall instead of being simply drawn in chiaroscuro or in colours." He then describes the process of preparing and tinting the cement or plaster, which is to be laid on the part of the building to be decorated, and which forms the background of the work, and explains how this is afterwards covered with a wash of lime of travertino, through which the lines are etched with an iron point. He further describes how backgrounds are obtained by the entire removal of the surface wash, and shows how strong projecting shadows for grotesque figures or designs of foliage may be produced by adding stronger shades of the same colour to the background.

Referring again to the graffitos at South Kensington they may be described as low relief in graffito rather than graffito proper, because the cut into the plaster or cement bed is excessively deep. The depth of the cut made with the iron or steel point by the artist in that particular work is a disadvantage, necessitated by plastering on the final coat instead of merely washing it on. So deep a cut gives a hard appearance to the design and impedes the water from running off the walls, whilst tending to accumulate dirt. The true Italian graffito is without this inconvenient feature, because the depth of the cut is scarcely perceptible. The cut or score made by the instrument does not generally exceed the thickness of a sheet of drawing-

paper, or in other words very little more than the thickness of the surface layer with which the bed-work is covered. Extremely beautiful effects can be produced under these conditions, perhaps more beautiful than can be obtained with a soft pencil on a rough paper. The weight of the leaning point of iron is itself sufficient to remove the light surface, and to make the dark background appear without fatigue to the hand.

In some backgrounds colours in monochrome are sometimes added and these are treated just as you treat fresco, which is very easy after experience has taught the difference between the tint in its wet and dry state. Some of the richest and finest effects are reached by the addition of gilding to some part of the graffito, as ribbons, fruits, arms, &c. The gold, however, must be added when the graffito is perfectly dry.

Naturally there is much in graffito decoration that experience teaches, but it is not very difficult to execute, and it seems to be deserving of more attention in these days of progress, in virtue of its durability as well as of the excellent effects it lends itself to producing. There seems to be a good field open for teaching graffito decoration in the art schools which have been so largely established in this country.

There are still other modes of decorating the exterior of edifices which were adopted by the fifteenth-century artist, namely, that of chiaroscuro in fresco and of fresco in colours. The first has at a distance all the appearance of graffito, and, although the design is not cut, it has similar colour and effect.

Much was done in this style by Maturino Fiorentino and Polidoro da Caravaggio, both of whom arrived at the highest point in this art of decoration with their immortal work of chiaroscuro in fresco in Via della Maschera d'Oro in Rome. Many other examples could also be mentioned, but as this work is the most important amongst the others, it will suffice as an illustration of this beautiful art. The frieze representing historical scenes is the most important decoration, and in a certain sense it recalls to mind the sequence of pictures which compose the *Triumph of Caesar*, by Mantegna, at Hampton Court.

Speaking of fresco, what is meant is the real Italian fresco, and not tempera or incausto, which is occasionally confused with it. As an external decoration it may be considered to be truly ideal, and it is to be regretted that in England it appears to be absolutely out of fashion.

Outside fresco, when it is done with good and pure earth colours, upon suitable lime mixed with much sand and puzzolana of that sort which the Romans used for the Coliseum, becomes very solid, hard, lasting and washable, just like compact and durable stone.

It is really to be regretted that to-day the exterior of buildings is so much limited in the matter of decoration to frames, columns, or, in a few words, to architectural mouldings, whereas the old masters of nearly all ages introduced into their edifices all that contributed beauty. Why, it may be asked, render so poor the mother of all arts—the one which more directly speaks to our souls, which is so impressive, which cheers and covers us?

Let us then also return to the old masters for the colouring of our edifices. If we like we may return to the splendid Greek edifices, but above all let us return to that apotheosis of refined taste in this great art—the immortal, the luxurious, the sublime St. Mark's, in Venice. The creators of that monument were not only architects, painters, or sculptors, but they comprised all that is understood by the illimitable and magnificent significance of the word—Art.

That monument which speaks to the heart in a language of gold is a creation which will always remain immortal. St. Mark on this earth without colour would not be worthy, as it is, of St. Mark in heaven.

TESSERÆ.

Myron's "Discobolus."

THE "Discobolus" by Myron was one of the most celebrated works of ancient art. The original was in bronze, but there are still several ancient copies of it in marble, though not one entire—one in the Campidoglio, one in the Vatican, and a third was in the Villa Massimi at Rome. That in the British Museum was found in the Villa of Hadrian near Tivoli, in 1791, and passed into the possession of Mr. Townley through the hands of Mr. Jenkins, a well-known dealer in works of art of that time. Some other trunks of ancient statues, which have been variously restored, are also said to be marble imitations of this work of Myron. The Townley copy, according to some critics, has been incorrectly restored, and the head is said not to belong to it. In Lucian's description of the "Discobolus" of Myron the head is noticed as being turned and looking back, as it does in some other of the reputed copies of this celebrated work. It must be observed, however, that there is no proof whatever that any of these marbles are copied from the celebrated "Discobolus" of Myron. The

Abbate Fea appears to have been the first to suggest the identity, which occurred to him from the similarity between the Massimi "Discobolus" found in the Villa Palombara in 1782, and a "Discobolus" by Myron as described by Lucian, and in part by Quintilian. Quintilian (ii. 13) merely alludes to its distorted position and elaborate execution; Lucian ("Philopseudes, 18) describes it more in detail. He says:—"The 'Discobolus,' in the twisted posture with the hand reversed and one knee bent, as if about to vary his attitude and rise with his throw, his head being turned to τὴν or τὸν δισκοφόρον—the quoit-bearer," which Fea interprets by "the hand in which he has the quoit." These words are, however, sometimes rendered "the girl or boy who holds the quoit," implying that the thrower was not yet in action, having only assumed his position, turned his head back, and extended his hand to receive the quoit from the bearer in attendance, who is implied only by the attitude of the "Discobolus," not expressed. The Townley marble is, however, throwing the quoit, both knees are bent, and the toes of the left foot, on which the figure partly rests, are turned back. The action is perfectly momentary, and he is already giving the impetus to his throw. Barry preferred the forward direction of the head, as in this statue, to the turn spoken of by Lucian and seen in other statues of this subject, as much more consistent with the necessary impetus of the throw. He says:—"The position of the head, hanging down in the same direction as the body, is very remarkable in Mr. Townley's figure, as it is a deviation from the original of Myron, as described by Lucian, and consequently from the Massimi copy, which corresponds perfectly with that description. In all other respects these figures agree, and this deviation appears to have been not unwisely made, as in this way all ambiguity in the intention of the figure, by the direction of the eyes (which are not wanting in the action), is ingeniously avoided; and in finishing the action, at least an equal acceleration of impetus is produced by the head shooting upwards and forward, along with the other extremities."

The Luneborch Brass, Lübeck.

In the cathedral church at Lübeck is a noble brass to John Luneborch, "Proconsul" of Lübeck, who died in 1464. It consists of one vast surface of plate measuring about 12 feet by 6, upon which is engraved the effigy beneath a nine-foiled canopy, and the whole background filled in with rich diapering. The deceased is represented in ordinary civil costume, but with the tunic richly embroidered and guarded with fur; his head rests on a pillow; a narrow baldrick sustains an anelace and a gypcière, both on the right hip; the shoes are sharp-pointed "high-lows." Between the feet is a shield charged with three castles. The legend is marginal, with the background sunk so as to leave the letters raised, and at the angles are the evangelistic emblems; beyond the legend is a rich band of diaper. The diapering of the general background bears a strong resemblance to the Flemish brasses found in England, such as those of Lynn and Topcliffe a century earlier. The whole design is extremely artistic, and such as we may look for in vain in English work of the same nature, even at an earlier period; the head is especially noticeable as an evident portrait, designed with excellent skill. The monument affords a good illustration of one of the most curious facts in the history of monumental brasses, that whereas upon the Continent they were, from their origin throughout their whole period of use, designed with almost invariably high artistic skill, yet in this country, although infinitely more numerous, we cannot point to a single ancient example which can fairly be said to exhibit any special artistic skill, while the large majority were evidently "workman's work." In the same church are a number of very ancient linen altar cloths (not frontals), of extreme value and interest; one probably dates from the thirteenth century. There are also some good examples of ancient silver.

The Miniatori.

The illuminating of MSS. is generally considered as a connecting link between ancient and modern painting, but though at the revival of painting MSS. were illuminated by painters, the caligraphists must have been always a distinct class, and even the initial letters and borders were executed by distinct persons from those who wrote the MSS., which is evident from the fact that some MSS. want the initial letters altogether, the spaces being left to be filled in by the proper artist. Though many illuminators of MSS., or *miniatori*, at about the revival of painting became subsequently great painters, it is not likely that painters became the illuminators of MSS. at any time beyond the execution of the miniatures which were attached to them. There are few even moderately good miniatures as works of art to be found in any MSS., and the best of all are those executed by the celebrated Memling and his nearly contemporary, Giulio Clovio, a native of Croatia, who died 1578, aged eighty; executed therefore at the time when painting was at its highest state of perfection, which shows that the influence of the great works with which Flanders and Italy

then abounded reached the decoration of MSS. as well as other objects of taste, the less influenced by the greater; but the reverse was probably never the case, and it would be difficult to show that painting was ever in any way improved or even preserved by the illumination of MSS. The *miniatori* (from *minium* or *minio*, red lead; Pliny and Vitruvius sometimes mean vermillion by *minium*) are said to have been the only painters of the Middle Ages, but this is an incorrect assumption, and that the *miniatori* also were the revivers of painting in the tenth and eleventh centuries is a mere theory founded on assumption. Constantinople always had its painters, and there is a Latin work extant, of as early a date probably as the ninth century, which treats of painting in all its branches, "De Omni Scientia Artis Pingendi," not omitting painting in oil. There is a MS. of this work now in the British Museum; it is by Theophilus Presbyter, whom Lessing supposes to be the same person as Tutilo or Tuotilo, a monk and painter, "picturæ artifex," of the convent of St. Gall, in Switzerland. Vasari, in the "Life of Dom Lorenzo," informs us that the writers of letters were a distinct class after the revival of painting, for he notices Dom Jacopo, of Florence, a monk of the Convent degli Angeli, of the fourteenth century, as the most celebrated letter-writer, "scrittore di lettere grosse," not only in Tuscany, but in the whole of Europe. He left his convent sixteen folio choral books with miniature illuminations by another monk of the same convent, Dom Silvestro, and their skill was so much venerated by their brother-monks that their right hands were embalmed after their death and preserved in a tabernacle. It appears that the earliest MSS. extant of Greek and Roman origin are not much ornamented, their embellishment consisting in little more than the occasional use of red ink for titles or commencements of books. No ornaments have been found in the Herculaneum papyri. The Egyptian papyri are written in various colours; they contain mythological figures in red, blue, yellow, green and white.

Greek Mouldings.

The leading outline of Greek moulding is the gracefully flowing cyma. This will indeed be found to enter into the composition of almost everything that diverges from a right line, and even combinations of mouldings are frequently made with this tendency. It is concave above and convex below, or the reverse; and though a long and but slightly flected line connect the two ends, they will always be found to correspond; that is, the convexity and the concavity will be in exactly the same curve, so that if the moulded surface were reversed and the one made to assume the place, it would also have the appearance of the other, and the effect would be the same. It is in fact the Hogarthian line of beauty, and it is not a little singular that Hogarth, in his well-known "Analysis of Beauty," although he did not know and indeed could not have known the contours of Greek architectural mouldings, has given the principle of them, and under his line of beauty has described many of the finest Greek forms. The Roman and Italian mouldings were called Greek in his day, and he assumed them to be so, but they evidently do not agree with his theory, whereas in principle the now well-known Greek forms do most completely. The cyma-recta is generally found to be more upright and less deeply flected than the cyma-reversa; it is almost always the profile of enrichments on flat surfaces, of foliage, of the covering moulding of pediments, of the undercut or hooked mouldings in antæ caps, the overhanging not affecting the general principle; and it pervades, as we have said, flected architectural lines generally, whether horizontal or vertical. The cyma-reversa has all the variety of inflection that its opposite possesses, but the line connecting its two ends is for the most part more horizontal, and its curves are deeper. It pervades many architectural combinations, but is most singularly evinced in the composition of the Greek Doric capital, which is a perfect cyma-reversa, with the ends slightly but sharply flected, as it flows out of the shaft below, and turns it under the abacus above. The obviousness of the former is prevented by the annulets which divide the cyma into an oval and a cavetto, but the principle is clear. The cyma is the governing outline in the congeries of mouldings in bases also, as may be noticed in Ionic and Corinthian examples.

Pompeian Houses.

Although it has been ascertained that the Romans understood the manufacture of glass, or at least that they possessed some utensils of that material, it must not be supposed that they were accustomed to apply it to exclude the weather and transmit light; for in no case has a glass window of any kind been discovered in any ancient structure, and, without contemplating the houses of Pompeii, it is impossible to appreciate the advantages we derive in our habitations from the application of that beautiful production of the useful arts, and how much superior it alone renders them to those of the ancients. The floors of the houses of Pompeii and Herculaneum are all of mosaic work, coarser and simpler in the less esteemed parts, and finer and more ornate in the more finished apartments: the ornaments are borders, dots, frets, labyrinths, flowers and

sometimes figures. In this, too, the superior advantages the moderns enjoy are evident. The ancients did not understand how to construct wooden floors, at least the application of timber to that use was not made by them; for, though it were admitted, which, however, it cannot be with justice, that in the warmer climate of the south of Italy, lithic floors would be more grateful, that would not be the case in this country; and we find the remains of Roman houses, baths, &c., in England, with floors of mosaic, as in Naples and Sicily. All the indications which are found in Pompeii of an upper storey consist in a few rude and narrow staircases, which, it is very probable, were to afford access to the terraces or flat roofs, for they are not common, and no portion of an upper storey remains in any part, though the lower or ground-floor rooms, it is most likely, were arched over. In one part of the city the houses on one side of a street are on a declivity: there a commodious flight of stairs is found to lead from the atrium in front to another atrium and rooms below, not under the houses, but behind them; for neither do we find an underground or cellar storey in the Pompeian houses. On the shores of the Bay of Baïæ and of the Gulf of Gaeta, at Cicero's Formian Villa, however, there are crypts or arched chambers under the level of the mansions; for the sites require substructions; but it may be questioned whether even these were used as parts of the house and as we use cellars, for they present no indications of stairs and have no regular means of intercommunication. Neither had the houses of the Romans chimneys of any kind; their only mode of warming their apartments was by means of braziers, many specimens of which have been taken out of both Herculaneum and Pompeii; and their cooking fires were on fixed gratings over a sort of stove, but without flues; so that most probably charcoal alone was burnt for domestic purposes. In this respect the modern Italians are not far beyond their predecessors; and the mode used by them of applying fire in warming and cooking appears very similar to that used by the Romans. Indeed many of the peculiarities we have noticed in the Pompeian houses are still found in various parts of Italy and Sicily; the cortili, courts, or cloisters of palaces, mansions, monasteries and inns are representatives of the *cavædia*, vestibula, atria or courts of Pompeian or Roman mansions. It is common, too, in the former, for bedrooms to open on open galleries, as on the colonnaded courts of the latter. There are instances also in the countries referred to of rooms which have no aperture but the doorway. Shops are frequently mere cells having an opening towards the street, part of which is a door, and the other part, with a low dado, a window. It was only in the forums and public places, then, that architectural beauty and magnificence were displayed in a Roman city. Street architecture was unknown and the decoration of houses was the work of the plasterer and painter rather than of the architect.

The Royal Academy and the Georges.

George III. caused apartments for the schools to be fitted up in his own palace of Somerset House, supplied the Society with rooms in Pall Mall for their exhibitions, and for several years made up every deficiency in their expenditure from his privy purse; with true and considerate benevolence he allowed them at the same time to reserve a hundred pounds a year to form a fund for necessitous members or their widows, and twice that sum to administer occasional relief to artists in distress, whether they were members of the Society or not. The king constituted himself the head of the Academy, and showed a personal interest in its success; he gave frequent audiences to its officers, confirmed its proceedings when his sanction was necessary, and attended to all its concerns as if it were part of his household. When old Somerset House was purchased by the nation as a site for a number of public offices, the king took care to reserve a portion of the new building for his Academy. In 1776 the plans of a new site were submitted to the approval of the president and council, and the apartments devoted to this purpose were fitted up with a degree of magnificence worthy of a royal palace, the talents of many of the principal members having been employed in its decoration. In July 1780, the preparations being completed, the Royal Academy obtained possession of their new residence, by an order from the Treasury to the Surveyor-general of the Works, and their first exhibition in Somerset House took place in the following year. This friendly superintendence of its affairs and anxious desire to promote the welfare and utility of the Society continued till the year 1800, when the health of the king unfortunately became so much impaired as to prevent any further interviews between the Academy and its patron. But the institution had now acquired stability, and though its acts for some time remained unconfirmed, it continued to exercise its functions; and when the government was placed in the hands of the Prince Regent, he took the Academy under his protection and approved of their proceedings. On his accession to the throne, in 1820, the position of the Academy had become somewhat changed. A gradual augmentation in the receipts of the annual exhibitions, aided by a judicious economy,

had enabled the members to support the schools on an increased scale of expenditure, and to provide for the continuance of the establishment from its own resources, without the assistance of the king. On the death of George III. the Academy solicited his successor to honour them with the same patronage which they had received from his predecessor. George IV. readily consented to adopt the Royal Academy, and, in furtherance of the views of its founder, placed himself at the head of the institution, and thenceforward gave the sanction of his signature to such of their proceedings as required it. Though the Society did not derive any pecuniary assistance from George IV., they were on many occasions indebted to his munificent patronage. He honoured the president with a distinctive badge, a gold medal and chain, to be worn on all public occasions. He presented them with a magnificent lamp for their principal room, and greatly forwarded the utility of the schools by giving them a large and highly valuable collection of casts from the finest antiques, which were procured from Rome by the intervention of Canova.

Swanscombe Church, Kent.

Swanscombe Church, between Gravesend and Dartford, possesses much archæological interest. It has a handsome broached steeple and a tower containing a perfect example of a Saxon window, built of Roman bricks, the upper part of the tower being Early English; the nave is Transition Norman; the aisles, formerly Early English, now contain in the south decorated windows of about A.D. 1350, and in the north Perpendicular; the chancel is Saxon, an inside arch of chalk being considered by Mr. Parker to be of Edward the Confessor's time. There are also Early English lancets, and the chancel has been continued eastwards. The windows on the south side and the fine one at the east end are Decorated. About twenty years ago some mural paintings were discovered in the church. The most important of these were two figures found on the walls of two recessed niches, north and south of the chancel-arch; the masonry of the arches over these niches is very early and probably Saxon. The figures were too imperfectly preserved to admit of any positive conclusions as to the saints intended to be represented. There was, however, very little doubt, from the remains of the head-dress of one of them, that it was intended for St. James. The other was probably the Blessed Virgin. The figures belonged to the early part of the fourteenth century. Beneath the paintings were indications of two earlier coats of colour, which soon disappeared on being exposed to the air. One piece, which was of the fifteenth century, showed a very flowing design; this was in the soffit of the arch on the north side. A black and white design, arranged in the pattern of a chess-board, was in the soffit of the south aisle arcading, and was of a much later date. There were in the capital of the first column the mortice-holes of the roof-loft beams. Some of these holes had been coloured black in distemper. The other design, containing a flower and leaf-tracing, was very good. This was in the soffit of a window of Edward II.'s time, which had been blocked up in the latter part of the fifteenth century. When the walls were cleared of the plaster there was hardly a portion where colour had not been; unfortunately it dropped off on the removal of the white-wash. The brilliancy of the colours, while they lasted, recalled what may be seen at St. Cross, near Winchester. It was impossible to preserve any portion.

St. Ambrogio, Milan.

This building is one of the most interesting monuments of the Middle Ages. Constructed on the usual plan of the Latin basilicas, it is of noble dimensions, and though of a ponderous character, is free from the monstrous imagery with which the churches of the eighth century were usually disfigured. In this church, as at St. Agnese at Rome, there are galleries, and windows above the galleries. St. Ambrogio was thoroughly repaired by Archbishop Oberto, and his successor, Philip, in the latter part of the twelfth century, on which occasion the original style of the building appears to have been preserved, but this was not the case when the church was again repaired in the thirteenth and fourteenth centuries. At the time of the second reparation the pointed arches were introduced. But the most remarkable feature of St. Ambrogio is the magnificent atrium, fully as large as the nave of the church. Here we feel the influence of Rome, and the general plan of the building shows the respect which was constantly commanded by the apostolic basilica and yet modified by Teutonic feeling.

Niches.

There are very few cases in which these do not act injuriously on a composition, from the difficulty of making them cohere with the other parts; the usual mode in Italian practice is to give them the effect of windows, which cannot be approved of. Internally they may be used with much better effect than on exteriors. If a niche is intended to receive a statue it should have a circular head; if a vase, it will perhaps be better straight. The plan of a niche is semicircular.

NOTES AND COMMENTS.

So many risks attend hydraulic works, there are numerous contractors who, although courageous enough, will not undertake that class of work, for they believe it needs the skill of specialists. The Shoreham Harbour Trustees have had no fear of attempting operations that would daunt practical men. A contractor offered to set the piling of one of the wharves on economical terms, but, as the Trustees considered he ought to have charged for materials alone, and would not allow any sum for labour, they resolved to carry out the operations themselves. They now find that, although they have obtained a 20-cwt. steam-ram, the piles are refractory and will not descend, and if they go down it is in a wrong position, where they form so irregular a line that a source of danger to shipping will be created. Being amateurs the Trustees did not take any trouble to discover what kind of material had to be pierced. They thought piles had only to be rammed and at once they sank. Now it is imagined there is an impediment caused by the remains of ancient piling, and we expect to hear that the Trustees have commissioned some dentist in Brighton to draw the stumps. If a difficulty of the kind arose with a contractor there would be no mercy shown him, and he must contrive to fix the piles on the line indicated. But some Trustees consider it would be better to try another line, although the waterway would be narrower, while others propose getting out of the difficulty by abandoning close piling and substituting a few piles with planks nailed to them. A few sensible members, however, consider it will be better to kiss the rod, humbly admit the failure, and implore the rejected contractor to get them out of their difficulty. That is the only way to prevent the harbour from becoming useless. At the same time why should not the Shoreham Trustees be allowed to amuse themselves by meddling with construction as well as other bodies? They are under the disadvantage of having their folly exposed. But if a similar effort had been made at the riverside in London, it would be announced in Spring Gardens that the work was an extraordinary success, and completed at a tithe of the price which Messrs. AIRD or other experts in hydraulics would have charged.

THE venerable Professor DIETRICHSON, of Christiania, who has done more than any man of the century to create an interest in Norwegian buildings, read a paper on Drontheim Cathedral at the Congress on Art History which was held last week at Cologne. It was listened to with the utmost respect. According to the latest researches, the building represents four periods. Christianity was unknown in that part of Europe until a comparatively late period, and a cathedral at Drontheim was not commenced until the year 1077. When the bishopric was changed to an archbishopric the people resolved to make the building more worthy of its dignity, and an enlargement was commenced in 1161. The work was interrupted by one of those contests which were common among the Norsemen. In 1183 the works were resumed, but the cathedral was not completed until 1299. The choir is the most beautiful part of the building, and Professor DIETRICHSON says there is no doubt it was a derivation from Canterbury. The sculpture and ornament were also evidently derived from English models, some of the heads being remarkable for their vigour. A period followed which was not advantageous for the nationality of Norway, and the cathedral seemed to exemplify the state of the country. Between 1328 and 1719 five conflagrations occurred. During the last century it was a ruin. When in the present century the Norwegians became conscious of their old greatness, the restoration of the cathedral became a national work, and so far has been vigorously promoted.

FROM the time they left the North of Europe the history of the Longobards, as hitherto written, consists in little more than feats of broil and battle. As became members of the Germanic race they were not, however, without desires to express their feelings in other ways, and Professor IMMERMANN was able to prove at another meeting of the Cologne Congress that the Longobards were artists. His discoveries on the subject were too numerous to be explained in a limited time, and he could only give an

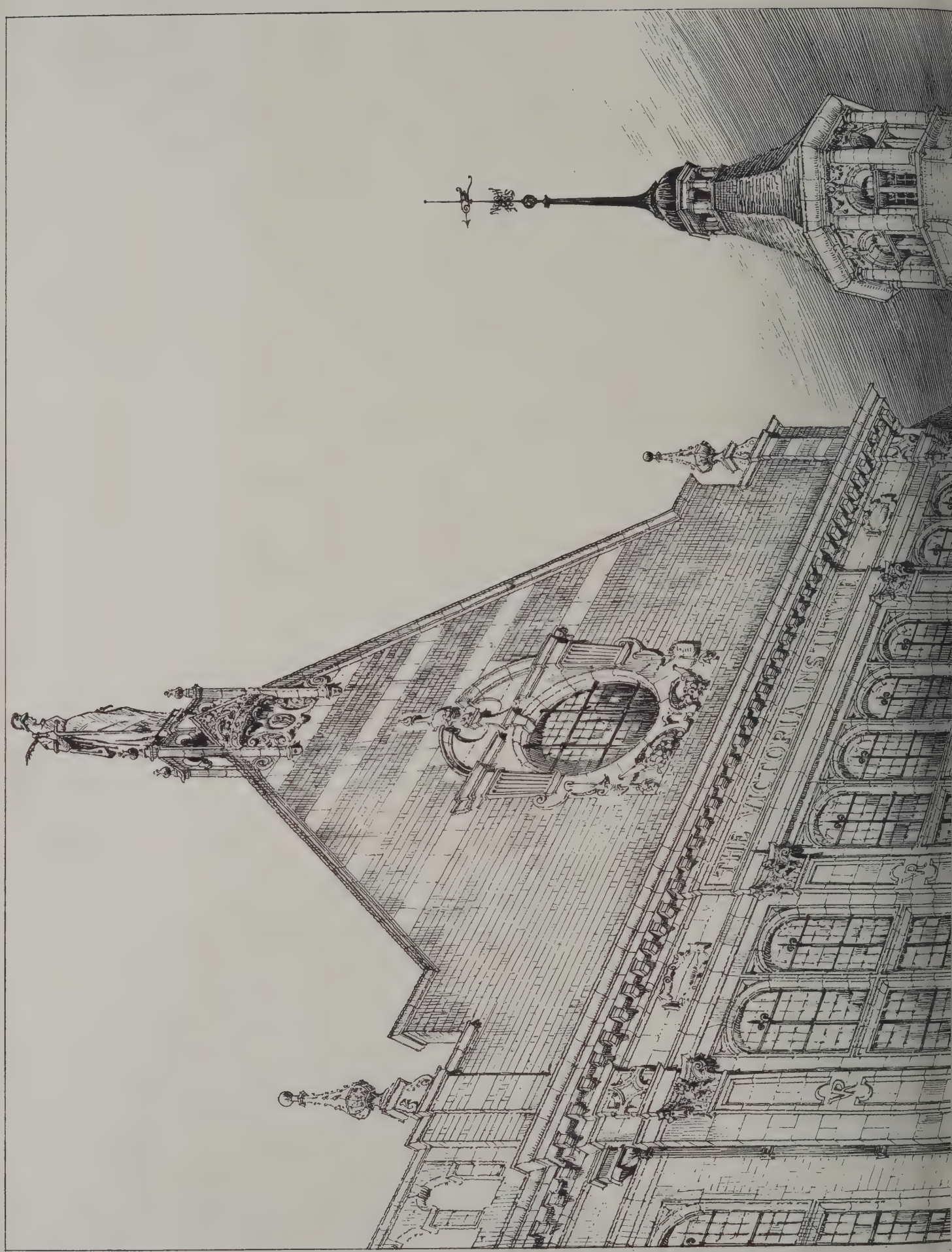
indication of them. The time of the arrival of the Longobards in Italy is uncertain, but under ALBOIN they crossed the Alps and seized Lombardy about A.D. 568. Their invasion extended to Sicily. Their settlements can be identified by reliefs in which ornament is seen that consists of figures of strange animals, and which must have been a continuation of a style that was familiar in the North. In Friuli examples are common. They found the Byzantines had gained a footing in Italy. Frequently there were contests between the two, but sometimes they entered into alliances. There is much ornament which seems to be symbolical of the union, for the Germanic beasts are mixed with Byzantine scrolls and other conventions. The Professor might have added that the combined ornament also suggests the beginning of a reign of law, the overcoming of wild animal nature by bonds that, like the ornamental scrolls, may add dignity or punishment according to their acceptance.

IT WAS FAIRBAIRN, we believe, who first demonstrated at one of the meetings of the British Association that the strength of a variety of girders can be exhibited by diagrammatic lines. As iron and steel may be considered as constant in their power to resist compression and extension, it is easy to express that quality in the same way as any of the other natural forces, or as the results of statistics on a large scale. The large "girder sheet" which Mr. J. ARMER, C.E., has prepared for Messrs. J. BIRCH & Co., reveals the utility of using strength-diagrams for the rolled joists and rivetted beams which are required in everyday practice. By using two colours it becomes easier to trace the strength or rather safe load-line for any girder than if all the lines were in black. The diagrams relate to rolled steel joists, compound girders and rivetted girders. The safe load is taken as one-third the breaking load. The "girder sheet" will be a useful addition to the aids and appliances in architects and contractors' offices.

BEHIND the building in the Champs-Élysées where the Salon exhibitions are held is another which is the property of the Paris Municipality. It is used for occasional exhibitions mainly of an industrial sort. The position is of some importance, for it allows the city to have a sort of footing contiguous to the Government, for the Palais used for the Salon exhibitions is national property. In the proposals for the international exhibition of 1900, the architects can assume that the Palais will be removed, and any other buildings on the same side of the Champs-Élysées. That would apparently mean that the Municipal Building must also succumb to the necessities of the project. The Municipal Council are not disposed to allow their property to be demolished so easily. They have had their building almost reconstructed at a large expense, and in May next it will be in a condition to vie with the neighbouring Palais de l'Industrie as a place of exhibition. It will be necessary to determine about that time whether the Commissioners of the Exhibition of 1900 are stronger than the Municipal Council. The reconstructed building may have to vanish, but its value will be found to have increased tenfold, and a corresponding compensation will have to be given before any rights in it can be acquired.

A SECOND edition of MEYER'S "Handbook of Ornament" has been published by Mr. BATSFORD. It is unnecessary for us to express anew our admiration of the collection of examples, for the success of the book is evidence that what we said about the first edition has been endorsed by the public. A cheaper or more complete aid for the ornamentist is not to be found. A student who devotes weeks or months to the consideration of the plates, or whatever time is necessary to enable him to acquire definite ideas of the numerous subjects, will find he has gained an increase of power that will be advantageous to him throughout his career. The handbook should not be treated like a Post Office Directory and consulted only in emergencies. It merits to be made a subject of systematic study until the characteristics of the examples are impressed on the memory, and the result will well repay all the days that are spent in the work.

The Architect, Oct. 12th 1894.





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THE VICTORIA INSTITUTE, WORCESTER.
LIBRARY BLOCK, ENTRANCE FROM FOREGATE STREET.

JOHN W. SIMPSON, } Joint Architects.
E. J. MILNER ALLEN, }



THE VICTORIA INSTITUTE, WORCESTER.



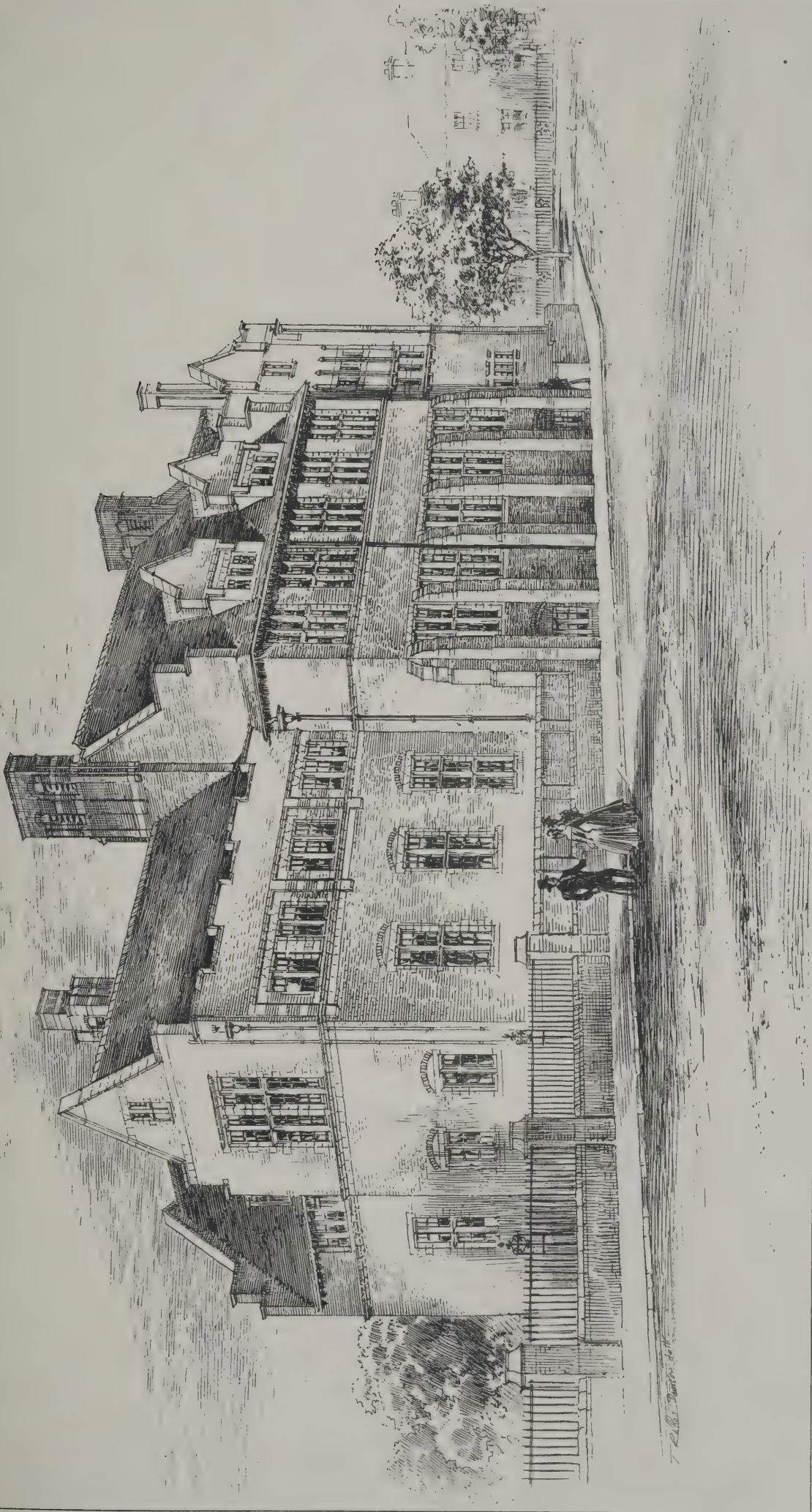
THE VICTORIA INSTITUTE, WORCESTER.
LIBRARY BLOCK. VIEW FROM SOUTH-WEST



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THE VICTORIA INSTITUTE, WORCESTER.
SCHOOLS BLOCK, VIEW FROM NORTH-EAST.

JOHN W. SIMPSON, } Joint Architects.
E. J. MILLNER ALLEN }



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THE VICTORIA INSTITUTE, WORCESTER.
SCHOOLS BLOCK, VIEW FROM SOUTH-WEST.

JOHN W. SIMPSON,)
E. J. MILNER ALLEN,) Joint Architects.

ILLUSTRATIONS.

THE VICTORIA INSTITUTE, WORCESTER.

LIBRARY BLOCK, ENTRANCE FROM FOREGATE STREET.

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SCHOOLS BLOCK, VIEW FROM NORTH-EAST.

THE illustrations we publish this week are reproduced from drawings exhibited this year at the Royal Academy, and representing the building which is now in progress from the designs by Mr. JOHN W. SIMPSON and Mr. E. T. MILNER ALLEN, of 10 New Inn, Strand. The foundation-stone was laid on April 3 by H.R.H. the Duke of YORK.

The site measures about 300 feet by 90 feet. The buildings are arranged in two blocks, having frontages to Foregate Street and Taylor's Lane and Sansome Walk and Taylor's Lane respectively. They are of red brick with buff or tawny terra-cotta and roofs of red Broseley tiles. It has been the desire of the architects to avoid the modern rendering of the Queen Anne type and to produce a building in the style of the latter part of the seventeenth century, which, being simple and quiet in its lines, will not be out of character with the dignity of the ancient city.

The block nearest to Foregate Street contains the library, museum and art gallery. The principal gable will be surmounted by a partially-armed figure in terra-cotta, resting on a sword and bearing a palm branch, emblematic of the city motto, "Civitas in bello in pace fidelis." The block has a central entrance from Foregate Street leading into the ante-vestibule. An open gallery on the first floor with seats in the recesses of the balustrade forms an effective feature, and gives greater dignity to the ground floor by increasing the height and at the same time improving the light and ventilation. A staircase of marble and mosaic, with steps 7 feet wide, leads to the museum and art galleries on the first floor. On the ground floor the reference library, 48 feet by 20 feet, is placed next to the Shirehall, with the tables arranged so that all the readers will face one way, lighted from the left hand, and under complete supervision from the service counter. Between it and Foregate Street is the committee-room (20 feet by 25 feet), with windows to Foregate Street. The news-room (84 feet by 22 feet) has end bays, and is situated in Taylor's Lane; it has a separate entrance from the street. It is immediately overlooked by the librarian, whose office controls the whole floor space. The book store is central, with the serving counters for the lending and reference departments contiguous; there is direct top light to the indicators. Access is provided to the basement floor, which is 10 feet high and of considerable dimensions. The access to the museum and art galleries on the first floor is provided by means of two staircases, the second one being in Taylor's Lane. On the first floor there are five museums and three art galleries. The former are on the Shirehall side, and the art galleries are over the news-room. The central and largest museum gallery is 45 feet 6 inches by 22 feet, and is to be named after Mr. ROWLEY HILL. The central art gallery is of the same dimensions and is to be called the "Charles Wheelley Lea Gallery." There are also provided cloak-rooms, curator's room, &c. At the corner of Foregate Street and Taylor's Lane is a circular tower with a staircase to the roof. Between this block and the schools block is an open space which will allow of future extension of the building.

The schools block accommodates the art, science and technical schools, having an elevation to Sansome Walk. The staircase immediately behind the central entrance gives separate access to each school, and each floor is divided by a corridor running the whole length, which allows access to a department without causing a thoroughfare through any other. The science school on the ground floor contains on the Taylor's Lane side a lecture theatre, with an arrangement of seats in tiers. It is 50 feet by 32 feet and 26 feet high, having an entrance from the corridor, another from Taylor's Lane, and a third by a staircase from the professors' room behind. The rest of this side of the floor is occupied by stores, and between the

lecture theatre and Sansome Street by the caretaker's entrance and men's cloak-rooms. On the other side of the corridor is the women's cloak-room, and behind it are two classrooms; behind these is the laboratory, which is shut off by screen doors to prevent fumes in the corridor. Behind this again are the balance-room and a preparation-room. Beneath these rooms are a long range of north-lighted workshops for the technical classes. They can be divided into sections as desired. Lavatories are provided for every department. The first floor is devoted to the art school. The elementary school, which has a top light, is 50 feet by 22 feet, and on the other side is an antique-room 60 feet by 21 feet. On this floor are also a painting-room, modelling-room, designing-room, master's-room, cloak-rooms and conservatory. The two blocks are connected by a subway. Messrs. WOOD & SONS are the builders, the foreman in charge being Mr. ADAMS, and the clerk of the works is Mr. BUSH SAGE.

TYNWALD HILL, ISLE OF MAN.*

WE stand on a spot as interesting to the antiquary as it is dear to the heart of every Manxman. In it we recognise the pivot round which for well nigh a thousand years has revolved the political life of this diminutive kingdom. Here new laws have been made and old ones declared and explained, grievances disclosed and redressed, differences between litigants adjudicated on and settled, criminals punished or outlawed. Here in the open air for many centuries the inhabitants of this happy isle have assembled to meet their kings, their governors, their judges and their lawgivers; and, improving the occasion, they have established here their fair ground, wherein to transact their commercial business. In the construction of this mound we feel a peculiar interest, for tradition tells us that it is composed of soil brought from each of the seventeen ancient parishes of the island. We stand on representative ground. It consists, as you will observe, of four circular platforms, the lowest having a circumference at the bottom of 256 and at the top of 240 feet, the second has a circumference at the bottom of 162 feet, the third of 102 feet, and the topmost of 60 feet. The total height of the mound is about 12 feet. A writer in "Notes and Queries," of February 1871, traces a symbolical meaning in and gives several interesting results from these figures. I am unable to follow him, but I think it right to point to the existence of these speculations.

The hill and the purposes for which it exists are, of course, of Scandinavian origin. The mound is known as the Tynwald Hill, modernised or Anglicised from the Norse "Thing Völla"—Parliament field—of the Middle Ages. There is a striking resemblance between our Tynwald arrangements here and those of the ancient Norse moot places, remains of which are to be found in Iceland, in Norway and elsewhere. Dr. Vigfusson points out some of these. There was always a plain (völl); here we have a plain flanked by rising ground. There was a hillock or mound; here we have this artificial mound constructed for the purpose. There was a court situate due east of the hill; here we have the court at the distance of about 140 yards east of the hill. There was a temple, a place of religious worship; here we have a church, dedicated to St. John the Baptist, on the site of older churches. There was a path for proceeding from one to the other; here we have such a path. The whole was enclosed by a fence; here an encircling wall exists. When the king sat on the hill, it was with his visage unto the east; the arrangement is the same here, as I shall explain later. All these points of resemblance exist, but there is one essential and vital difference between the institution here and what exists there. There we find only evidence of a life which has long ago become extinct, we find the skeleton from which we may guess what manner of man it supported; here we have the complete body, living and moving and having its being in the same form and to the same extent as it had when it was borne hither in the galleys of the Vikings one thousand years ago. It is remarkable, indeed it is romantic, that this interesting and picturesque institution which centuries ago died out in the mother country should have survived in this remote little colony and taken such firm root in a land where it was exotic; that in the midst of so many changes in the neighbouring countries, our home rule should have remained practically unaltered, so that we can boast of possessing the most ancient constitution in Europe.

The Danes and Norwegians who occupied this island for some three and a half centuries, ending about 1264, brought with them here, as to other places conquered by them, their laws and form of government. They established here a king

* An address delivered by Deemster Gill at the visit of the Cumberland and Westmorland Archaeological Society.

dom, the territorial limits of which comprised, as well as the Isle of Man, all the islands of the Hebrides which lie south of Ardnamurchan Point. The kingdom was designated "Man and the Isles," and its king "Rex Manniæ et Insularum." The seat of government was in the Isle of Man, probably at Castle-town; and of the twenty-four freeholders comprising the House of Keys (the representative branch of the Legislature), eight were chosen in the "Out Isles" and sixteen in the "Land of Man." The number of the Keys appears to have been originally fixed at twenty-four; it remained unaltered after the extent of the kingdom was reduced by the separation of the out isles, and it is the same to this day. The Keys were known by the Manx people as the "Kiare-as-feed," the four-and-twenty, and this is probably the origin of the name "Keys." It is, by some, thought to be derived from "Keise," the Norse equivalent of "chosen," and other suggestions as to the derivation have been made, but none appears quite satisfactory. The Keys were the third estate in the Manx Constitution; the second estate consisted of the Council—the Lord's principal officers, including or having associated with them the two Deemsters; and the first estate was the Sovereign or Lord of the Island. The formal designation of the Legislature is "The Governor, Council, Deemsters and Keys in Tynwald assembled." Thus constituted, this national Council or Thing, in later days known as Tynwald, met from time to time for judicial, legislative and administrative purposes. For judicial and administrative purposes it appears to have met in other places besides the hill at St. John's, for instance at Castletown, at Reneurling in Kirk Michael, at Keil Abban in Kirk Braddan and elsewhere, but it is doubtful whether for the purpose of the promulgation of laws it ever met except at St. John's.

It has been suggested, but I think that there is little foundation for the suggestion, that Tynwalds, each comprising twelve Keys and one Deemster, met respectively at the south and north of the island. It is undoubted that very marked differences have existed between the two districts; different laws and customs have existed and still exist in each, and the people speak with a noticeable difference in the intonation of voice. But I cannot find that there was even this splitting of the Tynwald. There is evidence of the Tynwald having sat at Reneurling in 1422, and at Keil Abban in 1429, but I think the court sat as a whole. Keil Abban is situated as nearly as possible in the centre of the island. It is exactly equidistant between the Point of Ayr on the north and the Land of the Calf on the south, and within half a mile equidistant between the east and west coasts. Whether this placing was the result of accident I do not know. There was a hill and an ancient church, but the church was not east, but south of the mound. More might be said as to Keil Abban, or Keil Ammon, but time forbids.

We must turn to the modern use of the Tynwald Hill. After the Norsemen the Scots ruled here for over a century; after them the Earls of Derby were lords. Sir Stanley, second of this line, visited his kingdom and held a Tynwald in 1414. For his instruction the following document was prepared:—"Our Doughtful and Gracious Lord, this is the constitution of old time, the which we have given in our days, how ye should be governed on your Tynwald Day. First, ye shall come thither in your royal array, as a king ought to do, by the prerogatives and royalties of the Lord of Man; and, upon the hill of Tynwald, sit in a chair covered with a royal cloth and cushions, and your visage unto the east, and your sword before you holden with the point upward, your Barons (in the third degree) sitting beside you, and your benefited men and your Deemsters before you sitting, and your clerks, your knights, esquires, and yeomen about you (in the third degree), and the worthiest of your land to be called in before your Deemsters, if you will ask anything of them, and to hear the government of your land and your will, and the Commons to stand without the circle of the hill with three clerks in their surplices, &c." This imposing ceremonial in the prescribed form continues to take place here annually on July 5 (the 24th of June, old style—St. John's Day), and all the laws which have during the year been passed by the Legislature and received the Royal assent are promulgated in English and in Manx to the assembled multitudes. No statute is of any validity until it has thus been promulgated. After it has been passed by all the estates of the Legislature, it lies dormant until it has been proclaimed from the Tynwald Hill.

THE STORY OF TEMPLENEWSAM.

IN connection with their visit to Leeds T.R.H. the Duke and Duchess of York were the guests of Mrs. Meynell Ingram. The *Leeds Mercury* in an interesting article says:—"This is not the first occasion on which Templenewsam has been honoured with royal visitors, for both in modern and less recent times that historic and beautifully situated mansion, and the noble demesne of which it forms a part, have had associations with royalty. Some twenty-six years ago the Heir-Apparent when he came to open the Leeds Infirmary was a guest there; and

early in the present century the then Prince of Wales, afterwards George IV., visited Templenewsam, and the superbly painted paper which adorns the walls of the ante-room to the red drawing-room in the south wing was a gift from the "First Gentleman of Europe" to the Lady Irwin of that day. At an earlier period the associations of royalty with Templenewsam were of a closer nature. In 1545 Lord Darnley, the ill-fated consort of Mary Queen of Scots, was born at Templenewsam, and the birth-chamber in the south wing is still known as Darnley's room. The mansion has seen many mutations or ownership, and there is some amount of scepticism as to the identity of this room; but there is little reason to doubt it, for so eminent an authority as Thoresby states that when, about the year 1622, Sir Arthur Ingram rebuilt the mansion, Darnley's room was preserved intact and incorporated in the new edifice. Indeed, the subsequent discovery, during some restorations carried out by the present owner, of the ancient doorways and masonry would appear to give absolute confirmation to the theory. Thoresby, moreover, speaks of a bed, which apparently had formed part of the furniture of the original mansion, and on which was inscribed in gold letters, "Avant Darnley, jamais derrière." This room is certainly the only trace of the original house of the Templars which remains. As will be seen, the estate in still earlier periods of its history reverted on more than one occasion to the Crown, and that proceeding generally followed the downfall, if not the death, of its owner.

Until the Knights Templars came into possession, Newsam was an unimportant hamlet, but from that date its history is one that has always been interesting and often eventful. The order of the Templars was instituted in 1118, and it was about the year 1181 that they established a Preceptory at Newsam. The land was either granted by, or purchased from, William de Viliers, who held it as tenant of the powerful house of De Lacy of Pontefract, and an ancient charter exists in which Henri de Laci, in the capacity of overlord, confirms the grant. There is no reliable clue as to where the Preceptory stood, though there is a scrap of evidence which goes to show that it did not occupy the present site of Templenewsam. In "Records of the Parish of Whitkirk"—a handsome and interesting volume compiled by Mr. George Moreton Platt and Mr. John William Morkill—there is a note appended to the chapter on Templenewsam which states that "in the ancient terrier of the Rectory of Whitkirk mention is made of a building called the Old Temple and of several parcels of land belonging to it. Amongst the latter is Kitchingham's Close, which we find marked on the tithe-award map near the beck which separates the township of Templenewsam from that of Thorp Stapleton, to the north of Thorp Hall." This Old Temple was, indeed, in existence within the last 150 years. Wherever their Preceptory stood the warrior-monks of the twelfth century gave Templenewsam its name, and their name is ineffaceably associated with its history, faint as are the records which remain. They continued in possession of Templenewsam until the dissolution of the order in 1312. Powerful as it was, and high as was the purpose with which it was established, the order had, comparatively speaking, a short existence. For many years it enjoyed very great prosperity, but it was the very growth of its wealth and influence which hastened its downfall, for luxury bred corruption and undermined in its members those stern qualities which had made them well-nigh omnipotent in the land, and its wealth and immense power excited at once the avarice and fear of Edward I., who then sat on the throne of England. In "Ivanhoe" Scott paints Bois Guilbert, the most renowned Templar of his day, in a very unamiable light, and another writer tells us that these knights, banded together as they were by Baldwin, king of Jerusalem, for the defence of the Holy Sepulchre and the protection of Christian pilgrims, "afterwards sank to the lowest state of depravity." The weight of opinion of well-informed students of the history of the period does not support this sweeping condemnation, but certain it is that the enemies of the order completely triumphed. But while it was thus exterminated, root and branch, something more than a mere memory of the Templars of Newsam still remains, for, like many other places in the district, Leeds to this day retains traces of the ancient privileges of the Templars—some houses which belonged to them being marked with their cross, as a sign of exemption from the obligation to grind at the Soke Mill; and Timble Bridge, leading from Leeds to Newsam, is said by Thoresby to be a corruption of Temple Bridge.

For a time after the extinction of the order of Knights Templars, Templenewsam was placed successively in charge of Adam de Hoperton and Sir Alexander de Cave and Robert Amecotes as custodians, and then was granted by Edward II. to Sir Robert Holland, a soldier of fortune, who was afterwards summoned to Parliament as Baron Holland. He owed his advancement almost entirely to the Duke of Lancaster. Yet when his patron placed himself at the head of a rebellion of the barons in 1321, Sir Robert, after promising him support, betrayed his cause to the king. His treachery brought its own punishment

however, for his possessions were seized and he was beheaded, a fate which befel a later and more distinguished successor to the estates. From the list of Sir Robert Holland's forfeited possessions it appears that he also owned the manor of Yoxall, with Hoar Cross, in Staffordshire, which, strangely enough, again in after years came into the possession of the owners of Templenewsam. Edward subsequently transferred Templenewsam to the Knights Hospitallers, but they held it for only a brief space, and in 1324 the estate was by arrangement restored, with the exception of the church at Whitkirk, to the Crown. Edward III. afterwards gave the estate to his kinswoman, the Countess of Pembroke, and the reversion was granted to John, Baron Darcy, who attained to eminence under the second and third Edwards, who fought at Cressy, and was at one time Lord Justice of Ireland. The Countess of Pembroke, however, outlived both Lord Darcy and his son and successor, who was also a distinguished soldier. The latter had married Elizabeth, daughter and heiress of Nicholas Meinill, Lord Meinill of Whorlton, and her second son assumed the title of Baron Darcy and Meinill, and after the death of the Countess of Pembroke obtained possession of the Newsam estates. The Hospitallers unsuccessfully contested his title, and in 1402, in the time of Philip, the fourth Baron, they made another abortive attempt to gain possession of the estates, which remained in the possession of the Darcys until the sixteenth century, when the last and perhaps the most celebrated member of their house, Thomas, Lord Darcy, was beheaded by Henry VIII. for the part he took in the "Pilgrimage of Grace"—a melancholy ending to a long and honourable and distinguished career. After his death Templenewsam passed to a Scottish family which stood near to the line of succession to the throne of the northern kingdom. The king presented it to Matthew Stuart, Earl of Lennox, whose son was the unfortunate Henry, Lord Darnley. Through Lord Darnley the estate passed to his son, James I. of England, who granted it in turn to Ludovick Stuart, Duke of Lennox, and with its sale by that nobleman to Sir Arthur Ingram, what may be termed the "modern history" of Templenewsam commences.

Sir Arthur Ingram was a son of Hugh Ingram, a native of Thorpe-on-the-Hill, who had amassed a fortune as a draper in London. Sir Arthur, who also adopted a mercantile profession, was a man of great ability, and being fortunate enough to gain and obtain the friendship of King James, he rose to fame and fortune. He thereby incurred the bitter enmity of the courtiers, and had in consequence to give up an appointment he held in the royal household, though he received ample recompense in other ways. He sat for the city of York in the last Parliament of James I. and the first two of Charles I., and he it was who rebuilt Templenewsam. It had not been long completed when the fire occurred to which Lord Strafford refers in one of his letters as occurring on Shrove Sunday, and doing damage to the extent of 4,000*l*. Only the south wing of the building was, however, affected, and it was restored in 1796 by Frances, Viscountess Irwin. With the advent of the Ingrams, the vicissitudes of the fortunes of the owners of Templenewsam may be said to have ceased. Sir Arthur's second son was for his fidelity to the Stuart cause rewarded by Charles II., in 1661, with the title of Viscount Irwin in the Scottish peerage. The fourth Viscount was Lord Lieutenant of the East Riding, and the fifth, who was governor of Hull, married Lady Anne Howard, who was the third daughter of Charles, third Earl of Carlisle, and who was a poetess of some repute. With the ninth viscount the male line became extinct. Of his five daughters, one married the Marquis of Hertford, who, on succeeding to the estate, took the name of Ingram. The third daughter, Elizabeth, had married Hugo Meynell, of Hoar Cross, in Staffordshire, and on the death of the son of the Marquis of Hertford the property passed to their descendant, and the Templenewsam and Hoar Cross estates once again became united. The widow of their grandson is the present owner of Templenewsam.

The mansion, as is probably well known to many of our readers, is built of brick, and forms three sides of a quadrangle. Of imposing exterior, internally it is richly, though appropriately appointed, and it is crowded with articles rich and rare. The picture gallery in the north wing is a magnificent apartment, and the private chapel leading out of it is a marvel of decorative art. For a long time past the reconstruction of the staircase at Templenewsam has been in contemplation, and the work was only recently completed. It is a magnificent structure in dark oak, elaborately carved, and with the shields of the family introduced. The ceiling overhead is of very ornate design, and below the frieze are displayed three shields, namely, that of Lady Lennox, the mother of Lord Darnley, and that of the Ingram family, the third bearing the arms of the Meynell-Ingram and Wood families. On the wall of the staircase hangs a very fine piece of tapestry, representing the death of Ananias. Mr. Wheeler says of the series of family portraits, from Sir Arthur Ingram to the present generation, that "besides the intrinsic merits of several, as works of art, it

forms an excellent study of English costume for more than two centuries." The collection of paintings, as a whole, is an extremely valuable one, including, as it does, examples of Guido, Albert Dürer, Vandyke, Titian, Rembrandt, Paul Veronese, Watteau, Borgognone, Poussin, Holbein, Reynolds, and other great masters. Other features of the mansion are the superb wainscoting of the dining and billiard-rooms, and the collection of antiquities which the latter apartment contains. It may not be uninteresting to add that there is in possession of the family a gilt tea service which had belonged to Frederic, Duke of York, the son of George III., and Prince George's predecessor in the title. It was bequeathed by Admiral Henry Meynell, on his death in 1865, to his brother, Hugo Charles Meynell-Ingram.

Whitkirk Church, which is believed to have passed to the Templars along with the lands obtained from William de Viliers, and which lies just outside the park gates, contains many memorials of the baronial house of Irwin. Not the least noteworthy monument in the sacred edifice, however, is the marble tablet on the north wall of the chancel, in memory of John Smeaton, the eminent engineer and builder of the third Eddystone Lighthouse. For some generations the Smeatons inhabited Austhorpe Lodge, which was built in 1698 by the grandfather of the engineer, and an interesting example of Smeaton's skill remains to this day in the shape of the ram which he constructed more than a century ago in the grounds at Templenewsam, for the purpose of forcing the water required for domestic purposes up to the mansion. It still serves that purpose, forcing water to a distance of 26 feet above the supply level at the rate of 60 gallons per hour, the engine making eight strokes per minute and driving about a pint per stroke. Another work of Smeaton's which is still in use in this district is a water-wheel at the Foundry Mill, near Seacroft, and both are stated to have required but few repairs since they left Smeaton's hands.

ARCHÆOLOGY IN SERAIEVO.

IN a letter to the *Times* Dr. Robert Monroe, of Edinburgh, gives an account of an archæological congress recently held under Government patronage in Seraievo, from which we take the following extracts:—

The actual business was begun when Baron Appel, after thanking the strangers for coming so far to take part in the scientific investigation of the antiquities of Bosnia and Herzegovina and wishing them success in the important deliberations in which they would be shortly engaged, called on Herr Hörmann, director of the museum, to read a paper on "Das bosnisch-herzegovinische Landesmuseum, seine Organisation und Ziele." Then followed another paper by Dr. v. Thallóczy (director of the archives) on "Die Culturperioden Bosniens und der Herzegovina, mit besonderer Rücksicht auf ihre monumentalen Ueberreste."

Afterwards the members were invited to adjourn to the museum to inspect its treasures under the guidance of Herr Hörmann (Early Christian and other monuments of the Middle Ages), Dr. Patsch (Roman antiquities), Herr Fiala (the prehistoric discoveries at Glasinaé and Sobunar), Dr. Truhelka (the collection of costumes), and Dr. Glück (anthropological collection). On this occasion, however, the visit was only introductory, but ample opportunities were subsequently given for a more careful study of its contents.

Meantime special attention was directed to a group of antiquities of the Stone Age, consisting of an immense quantity and variety of fragments of pottery, flint and other stone implements and weapons, &c., arranged by Berghauptmann Radimsky in one of the ground-floors of the museum, as in the afternoon the locality would be visited where these remarkable objects had been found. The excavations which yielded this assortment of early relics were still conducted by Radimsky, at a place called Butmir, in the vicinity of Ilidze. The fertile plain of Ilidze, which occupies a wide basin, has been formed by the *débris* of streams and rain-washed materials from the surrounding hills. The river Bosna, the main source of which suddenly springs out of the earth at the foot of the hills some two miles to the south, is virtually formed by the junction of a number of surrounding streams, meandering through the plain from different directions. In earlier times it is probable that this basin was more or less a lake, and, indeed, in winter portions of it become still submerged. Almost in the centre of this plain, and only separated from the grounds of the modern baths of Ilidze by the sluggish waters of one of the streams of the Bosna, there is a portion of land covering many acres, which on careful inspection is seen to be slightly more elevated than its surroundings. Some time ago it was discovered that all this raised area was composed of the *débris* of early human occupancy. Part of this prehistoric settlement or workshop, as some suppose it to be, is presently occupied by a large dairy and other buildings, but the rest is simply

arable land and can be readily excavated. The relics have been found scattered throughout the *débris*, apparently at all depths from 6 feet to 10 feet or so. A perpendicular section prepared for the members of congress showed this *débris* to be composed of clay, mould, charcoal, &c., arranged in more or less parallel strata, with here and there some wavy undulations. The method of excavation hitherto carried on seemed to have for its main object the collection of relics, and consisted in merely turning over the relic-bearing stuff till the virgin soil, a fine yellowish clay, was reached. The discovery of occasional hollows in the surface of this clay suggested to Radimsky that they might have been the foundations of the huts of the inhabitants, whose remains had accumulated above and around them. I may observe that there was no clearly-defined line of demarcation between these respective materials, viz. the virgin clay and the culture beds above, as bits of charcoal were often seen embedded in the former to a depth of several inches.

Radimsky's theory of this settlement was generally adopted by the members of congress, except by Professor Pigorini and myself, who argued that the entire phenomena, especially the stratification of the culture *débris*, could only be explained on the supposition that the huts stood on platforms supported by wooden piles, and that the refuse, together with the lost and worn-out implements, had gradually accumulated in the vacant space underneath. Hence the "find" at Butmir became the subject of an animated controversy at the congressional sederunt next day. Pigorini opened the discussion in a long speech, in which he advocated that there was a precise analogy between the deposits at Butmir and those of the Terremare of Italy. The principal objection to this theory was the absence of piles, of which hitherto not a trace had been observed, nor of any wood whatever. In defending Pigorini's views I pointed out that, although the actual piles were not now to be seen, all the woodwork having completely decayed, traces of the holes in which they stood might be found—a fact which was clearly established on the next visit by the discovery of several round holes penetrating into the underlying virgin clay. On section these holes were seen to have become filled up with clay and charcoal. But of course it has to be yet proved that the wooden uprights which formed these holes had been part of a general system of pile-structures. The result of the discussion was that further excavations were considered necessary, particularly in the direction of the limiting margin of the mound, before a trustworthy opinion could be formed in regard to the structure and origin of this remarkable settlement.

After inspecting the excavations at Butmir the party crossed the river by a wooden bridge to Ilidze, with its fashionable and elegantly laid-out grounds, baths, hotels, playgrounds, lawn-tennis court, flower beds, promenades, aviaries, &c. The primary attraction for all this display is its celebrated sulphurous spring, the curative qualities of which had been known to and largely taken advantage of by the Romans—a statement which is clearly proved by the remains recently unearthed around the spring, viz. foundations of houses, mosaic pavements, baths, water conduits, together with an assortment of the usual industrial remains of Roman civilisation. Some of the mosaic pavements are preserved *in situ*, but many of the smaller objects have been removed to the museum at Seraievo. Guided by a careful consideration of these Roman remains, the spring has been traced to its original source, and it is now surrounded by a circular stone basin, within which the hot water may be seen gurgling and bubbling up in large volumes.

Another locality to which an excursion was made, partly by carriages and partly on foot, was Sobunar, situated on the lower flanks of the lofty Trebević, immediately to the south of Seraievo. Here were found the remains of prehistoric huts, which contained a remarkable kind of pottery—vessels with projecting handles, strongly reminding one of the *anse cornute* of the Terramara mounds. There was besides a large assortment of bronze and bone implements and ornaments—fibulæ, pins, chains, pincers, combs, spindle whorls, &c.—and a few objects of iron. On the top of one of the most commanding spurs were the remains of a Roman fortification, the foundations of which had been recently partially exposed.

The next and most exciting of the field excursions was a visit to the high plateau of Glasinaë, situated among the mountains to the east of Seraievo, and entailing two days' hard work with carriages and riding-ponies. The excavations were so skilfully arranged that the merest working with the fingers was sufficient to expose the interments. Hence there was no time lost in bringing the eagerly-looked-for treasures to light. One body was that of a female, which had on the bones of each arm a bronze bracelet. On its upper part lay two four-lobed flat fibulæ and a hollow bead, all of bronze. The bracelets and fibulæ were ornamented with incised lines and concentric circles. The pins of the fibulæ had been of iron, but of these nothing remained excepting a little mass of the oxide of that metal at the points of attachment. Among the other grave-goods were a couple of fibulæ of the usual bow-shaped form, a bronze diadem and a peculiarly-shaped stone implement.

The forenoon of Tuesday, August 21, was devoted to a discussion on the antiquities investigated during the excursion, more especially on the age and place of the Glasinaë tumuli in the prehistoric civilisations of Europe. In the afternoon the more ardent spirits, headed by Pigorini, again visited the prehistoric remains at Butmir, but nothing further was discovered to clear up the mystery which still hangs over this settlement.

Another important group of objects exhibited in the museum was that recently collected near Bihaë, in what was formerly part of the bed of the river Una. From the numerous photographs, plans and sections so carefully prepared by Herr Radimsky, of the phenomena encountered during the excavations, there can be little doubt that he is right in regarding the habitations which stood there as veritable pile-structures. To this opinion the character of the remains lends support. Among the food refuse and relics collected were the broken bones of a variety of domestic and wild animals; some cereals, seeds and fruits; fragments of pottery, spindle whorls and a number of stone moulds for casting bronze celts; implements, weapons and ornaments of metal—all of which prove that the inhabitants here prosecuted the usual arts and industries of pre- and proto-historic times. Among the relics are a few characteristic specimens of La Tène culture, as well as objects of Roman and Mediæval times. The area investigated was thickly studded with the stumps of piles, and its extent was too great (some 30 yards long by 20 broad) to give countenance to the suggestion that it formed the basis of some special building, such as the corn-grinding mills, still constructed on piles and common along the streams of the country.

MANCHESTER SOCIETY OF ARCHITECTS.

AT the first meeting in the session of 1894-95, the president, Mr. John Holden, delivered his address to the members. After reviewing the proceedings connected with the reconstruction of the Society in 1891, which resulted in a large increase in the membership (now numbering 135), he urged the members generally to assist in carrying out the Society's objects, and by close attention to the rules and regulations to minimise the labours of the honorary officers. He paid a kindly tribute to the memory of some deceased members, viz. Messrs. John Elgood, Joseph S. Crowther, William Charles Tuke, James Maxwell and Lawrence Booth, whose loss, he said, would be especially felt by the older members of the Society. He also regretted the decease of Mr. J. H. P. Leresche, who had for ten years occupied the position of honorary legal adviser to the Society. The council had nominated Mr. William Goldthorpe, barrister-at-law, as Mr. Leresche's successor, and the appointment had been accepted by him. After touching upon the question of competitions, of builders depositing priced quantities for works to be carried out and other matters, the President said that he hoped before long to see a Chair of Architecture founded at the Owens College. This would be a great advantage to the students, and he advised them by increased efforts to show that it would be appreciated by them. He strongly urged the senior members to contribute to the education of the younger ones by reading papers, by giving information on matters connected with the profession and by supplementing the books in the library, and referred to the very generous gift of books by Mrs. Whitaker, the relict of the late Mr. W. W. Whitaker, architect, of this city. The younger members should by careful study and by passing the necessary examinations of the Royal Institute of British Architects qualify themselves to in their turn take office as presidents or vice-presidents of the Society, and to carry on the work which had for thirty years been going on, and had given the Society the first place out of London. The President afterwards delivered the prizes which had been awarded to the students for work during the past session. The principal prize of books, of the value of ten guineas, for the most satisfactory progress made by the Society's students in the architectural classes arranged by the council with the committee of the Technical School, was awarded to John Ormrod, and the second prize of five guineas was divided between William S. Beaumont and Alfred R. Parker. The other prizes respectively were given to A. E. Corbett, J. C. Dewhurst, Isaac Taylor and T. W. Hoolley.

The Reservoir at Osgodby, which supplies Scarborough with water, burst during Sunday night, and emptied itself of four million gallons of water. The reservoir is an old one, having been rebuilt in 1857. It is thought that 500*l.* will cover the damage. Apparently the concrete bottom of the reservoir has been forced out, and the water has escaped through the foundations without showing any trace. The water supply of Scarborough will not be affected.

MANX NAMES IN CUMBRIA.*

WE have often heard, since the days of Worsaae, that our district owes its population mainly to the northern Vikings, who infested the Irish Sea in the ninth and tenth centuries. It has been thought by Mr. Robert Ferguson, Mr. J. R. Green, our president, and other writers, that they came into the Solway and Morecambe Bay from headquarters in the Isle of Man. That theory may find support from a comparison of some Manx place-names with similar names in Cumberland and adjacent parts.

A few analogies have been noticed in print. The Rev. T. Ellwood mentions the two Fleshwicks, from *Fles*, in Icelandic, "a grassy place," and *vik*, "a creek." In his book on "The Surnames and Place-names of the Isle of Man," Mr. A. W. Moore compares:—

- I.O.M. Piel, with our Pile-of-Fouldrey.
- " Scarsdale, with our Scarfgap (*Skardh*, notch, paths).
- " Cammall, with our Camfell (*Kambr*, comb).
- " Colby, with our Colby (*Kollr*, hill top).
- " Surby, with our Sowerby (*Saurr*, muddy).
- " Kirby, with our Kirkby (*Kirkjubær*).

And Mr. Moore remarks that, of the Scandinavian elements which are common in our local names and dialect, some, namely, Haugh, Dale, Fell, Garth, Gill, Wick, Way (*vagr*), Ness, Toft and Thorp, are found in the island; while some, namely, Thwaite, Beck, With, Tarr and Force, are absent, from which he infers that the Isle of Man is less purely Norse and more Danish than Cumbria. But his book, with its full account of Manx names, gives us material for carrying the comparison further. There are three classes of words to consider:—A, Celtic; B, Scandinavian; C, mixed, the last class containing some curious examples of loan words from the Celtic to the Scandinavian.

A.—Celtic Names.

The Celtic words common in the Isle of Man when the Vikings became Celticised are rare with us, where the settlers kept their own tongue until they became Anglicised. Carrock and Cark match the Manx Carrick, "rocky"; Glencoin, "narrow valley," resembles Nascoin, "narrow waterfall"; Morecambe and Cambeck are like Glencam, with a common element—*cam*, "crooked"; our Crummock, though commonly interpreted Crumbeck, may be the same with the Manx and Galloway Crammag, "cliff." But most of our Celtic names are Welsh, since Cumberland was the land of the Cymru, and the earlier Gaelic element was partly crowded out, though traces of it returned with the Viking settlers, as I think to show.

Before their age, however, we have a few Gaelic importations. For just as the Irish monks preceded the Vikings in the Hebrides and in Iceland, so they did in these parts, no doubt using the Isle of Man as a stepping-stone across the sea. The Manx church of St. Bridget, Kirkbride, matches our Kirkbride and Bride Kirk; there is Kirksanton in both districts; and perhaps St. Sunday's Beck and Crag in Westmorland may be explained by the Irish Saint Sanctan; for in Domesday Kirksanton is written Santacherche and Santon is Suntun, which bridges over the transition from *Sanctan* to *Sunday*.

The Manx "kseeills" have Cumbrian analogies in Gilcrux and Gilcarron; and perhaps in two old names, Gilmartyne ridding prope Crofton (*temp.* John), and Gilmighel croft, near Pennington (*temp.* Ed. III.). All these churches and cells are near the coast, where such missionaries might have settled. St. Patrick himself, to whom there are dedications in the Isle of Man, is commemorated in Waspatrick (*temp.* Ed. I.), his wath over the Wampool; and on the same Roman road at Askpatryk (*temp.* Ed. III.), perhaps embalming some otherwise lost tradition of an ash tree under which he preached; as at Patterdale is the well where he is said to have baptized. In the Isle of Man also we find Ashtree and Well connected in Chibber Unjin, when the tree was formerly dressed with votive offerings. This custom, too, akin to the German Christmas trees, seems to survive with us; a great oak tree overhanging a fountain at Satterthwaite was dressed with crockery and coloured rags on Maundy Thursday a year ago, and another at Hawkshead Hill.

But these church names belong to an age before the Vikings came. They brought their own heathen worship, of which we find traces in both districts. And this leads us to the second class of words, namely:—

B.—Scandinavian Names.

In 1134, Bertrannus de London was one of twelve monks who, with their abbot, Gerald, founded Calder. The Rev. A. G. Loftie, in his guide to the abbey, remarks on the strangeness to this exiled Londoner of his new life and surroundings among rough neighbours and brethren, north countrymen all. But

again (*temp.* Ed. III.), William de London neglected to pay his "thrive" to St. Nicholas's Hospital at Carlisle; and the Testamenta Karliolensia show that the "de Londons" were a family of some local importance, without any suggestion of a connection with the great city. Now we all know places whose names are derived, like similar names in Denmark, Sweden and Iceland, from the *Lundr* or sacred grove of the Northmen:—Lund, near Whitehaven; another near Ulverston; Hoff Lund, near Appleby; and the Lound, near Kendal. But in the Isle of Man there is a Little London—for *Lundinn*, "the grove." This name suggests that we may look for the "London" of Friar Bertram not far from his first monastic home at Furness and for the "London" of farmer William in the land of Carlisle; for the difference is merely grammatical, as the Manx name seems to show.

Of this second class, all the Manx names can be matched in our district. Some are identical, as Ramsey, *Hramnsey*, "Raven's Island"; and Raby, *Råbær*, "nook farm." The termination "by," it may be remarked in passing, is by no means a test of Danish settlement. It is common in Iceland, and is quite good Norse. The terminal *r* is merely the sign of the nominative, and it was dropped after a time in pronunciation, like the parallel Latin *s* of the nominative, and it disappears in inflexions. Thus, "*ulfr*, his farm," is *ulfsbær*; Ousby, his water—*ulfsvatn* (*v*, pronounced in early times like *w*, and *vatn* sometimes written *vatr*). So Ulvrestune, of Domesday, must be for *ulfars-tún*, the enclosure of an early settler, Ulfarr. The popular pronunciation "Ouston" perhaps keeps a reminiscence of the later and greater Earl Ulfir, being the true equivalent of *ulfstún*. Some of these names are practically identical:—Cringles (Isle of Man) and Crinkle Crag (*Kringla*, "circle"); Jurby, formerly Ivorby and Ireby (Ivar's farm); Kneebie and Knipe (*gnípa*, "peak"); Sulby and Soulby (*Sölvi's* farm).

Some, again, are identical in one of the elements of which they are compounded. To take a few samples, some of them from old forms of Manx names:—

- I.O.M. Altadale and our Alps (*Alpt*, "swan").
- " A[s]mogarry and our Osmotherley (*Asmundar-gardhr-ljá*).
- " Brackabroom and our Brackenber (*Brekka-brín-bardh*).
- " Clet Elby and our Cleat How (*K'lettr*, "rock").
- " Clytts and our Cleator (*K'lettar*, "rocks").
- " Colden, with our Caldfell, &c. (*Kaldr*, "cold").
- " Dalby, &c. and our Dalton, &c. (*dalr*, "dale").
- " Foxdale and our Foxfield (*folks*, "of the people").
- " Grauff and our Orgrave (*aurr-gröf*, "clay-pit").
- " Hæringstad and our Harrington (*Hæring*, "hoary," proper name).
- " Hegness and our Honister (*Högna nes-staðhr*).
- " Keppellgate and our Keppelcove (*Kapall*, "nag").
- " Meary voar, &c. and our Merry hall—Mere beck (*mærr*, "borderland").
- " Orm's house and our Ormside (proper name).
- " Oxwath and our Oxenfell, &c. (*Oxavadh*, *öxnafell*).
- " Rozefell and our Rosthwaite, &c. (*hross*, "horse").
- " Sandwick, &c. and our Sandscale, &c. (*sandvick*, *sandskáli*).
- " Sleckby and our Harrowslack, &c. (*slakki*, "slope").
- " Staynarhea and our Stennerley, &c. (*steinn*, "stone").
- " Strandhall and our Strands (*strönd*, pl. *strandir*).
- " Swarthawe and our Swarthmoor (*svartr*, "black").
- " Warfield—Wardfell and our Warthole, Warwick (*vardha*, "beacon").

From one of such names in the Isle of Man light is perhaps thrown on a curious series of names in our district. Mr. Moore explains *Brausta* (old form of *Braust*) as *Brautarstadhr*, "roadstead." *Braut* in Icelandic means a road broken or cut through rocks or forests, as distinguished from *vegr*, *stigr*, *gata*, "path, track." *Brautarmót* is "a meeting of roads," as *Bekkjarmót* (*Beckermot*) is "a meeting of becks"; and to the settlers in Cumbria the Roman roads must have been a great and remarkable feature of the country. When they found a passage through the rocks and forests of Patterdale, it is no wonder if they called the tarns—by which it wound and at which it threw off a branch to the wonderful High Street—*Brautarvatn*, Brotherwater or Broaderwater—so called long before the traditional brothers were drowned there.

Again, Butterilket, the farm in Eskdale just under the Roman fort, was written Brotherellkell (*temp.* Eliz.), Brotherulkul (*temp.* Hy. IV.), Brutherulkil (*temp.* Hy. III.), suggesting that the original Norse name was *Brautarhöllkeld*, "road-hill-spring," where they stopped for a drink before taking the steep gradients up Hardknot. *Brautarhöll*, or a *Brotthöll* (*Brott* being a common form in compounds), reappears in Brott-hole-hill, in the Caldbeck neighbourhood (*temp.* Hy. III.); *Brattah* or *Brotto* in Legberthwaite may be the same, or else *Brotthaugr*, "road-howe."

* A paper by Mr. W. G. Collingwood, M.A., read at a meeting in Douglas of the Cumberland and Westmorland Archaeological Society, and published in the *Isle of Man Times*.

It is interesting to find that the degradation of "Brother-ilket" into "Butterilket" is matched in Norse philology by that of *Brautarsteinar* into *Bautasteinar*, the popular name of the "road stones" or monuments (see Cleasby and Vigfusson, s.v.). This may explain Butterlip-howe by the Roman road of Grasmere as a natural and pastoral improvement on *Brautarl-hidhhangr*, "road-gap-howe," a truly descriptive epithet, while Buttermere and Butterwick are perhaps better explained by *Búðir*, "booth"; *Búðharveggr* is good Norse for "booth-wall," and practically identical with the country pronunciation of Butterwick.

This confusion between *Brautar* and *Bauta* may have been helped on—and it may be remembered—by the fact that the Irish for "road" is *Bothar*. For it is well known, that the Northmen on the shores of the Irish Sea lost so much of their pure nationality, that this district of Galloway got its name from the Gall-gaedhil, the mixed Gall and Gael, Vikings and Celts. Even those who emigrated to Iceland took with them much Celtic blood and many Celtic words. Thus, *Njall* and *Kjartan* and *Kormak* are Irish of Norse Icelanders; *pollr* "pool," *brók* "breeches," and *poki* "bag," are Celtic loan words in Icelandic literature. Now I think it can be shown that the Norse settlers brought Celtic loan words into Cumbria, and that they brought them from the Isle of Man.

C.—Mixed Names: Manx Loan Words.

1. In the Edda is found a word *Korki*, from *korkey*, Irish and Gaelic *coirce*, "oats." Now Corby in Cumberland was written (*temp.* John, Ric. I. and Hy. I.) Corkeby and Korkeby, i.e. *Korkabær*, "oats-farm." A corresponding name in purer Norse is Haverthwaite, *Hafrathveit*. Similar formations are Ruthwaite and Ruckcroft (*temp.* Ed. VI. Rewcroft) from *rúgr*, "rye"; Rusland, however, was (*temp.* Ed. III.) Rolesland, *Rolf'sland*. Again, Bigland and Biggar (*Bygg-gardhr*) from *bygg*, "six-rowed barley"; the four-rowed barley, *barr*, may be found in Barton; so from *Korki Korkahlidh*, "oats-fellside"; the termination being degraded on the analogy of Ainstable (*temp.* Hy. I. Ainstapellith), i.e. *Einstapihlidh*, "fern-fellside," for the Norse *Ein* was pronounced like our "Ain," and *Steinn* like "stane." Again Corney (Cumb.) = Corna (I.O.M.) = Kornsa (Icel) "Cornbeck," so that the Cocker, on the banks of which is Cornhow, may perhaps be interpreted *Korká*, "oats-beck."

2. *Hnukr* is "Knoll, peak" in Icelandic, but uncommon, evidently from the Manx *Knock*, Irish *cnoc*. We have it naturalised in Knockpike and Knock Shalcok (*temp.* Ed. II.). Next we may take a set of words which are not found in the Icelandic dictionary, but are so used in Cumbria as to leave little doubt that they were brought over by the Celticised Vikings; and their form seems to be distinctly Manx, in some instances at least.

3. Peel is Manx for a "fortified town"; a word which, though not found in Icelandic literature, was certainly adopted by the Norse in Cumbria, and used to considerable purpose.

4. *Parak* occurs in our dialect, a loan word from Manx and Irish *pairc*; though in Iceland it appears only as a nickname.

5. *Dub* has in Icelandic nothing nearer than *djúp*, "deep sea"; while *dubbyr*, *dob* (Manx) means "a small pool" in our sense.

6. The Manx *Spooyt* of a waterfall, seen in our Gill Spout, &c., has no analogue in Icelandic. The nearest form is the cognate Aryan root *spýja*, "to spew."

7. The Scrow at Coniston is a turfey hill, an outlier of the Old Man. "Scrow" in our dialect means "a crowd," from Icelandic *shreiddh*, "shoal" of fish, &c.; or else "scrimmage," to which it is doubtless akin. But neither of these explain the hill; whereas the Manx for "turf" or "sod" is *scrah*.

8. Now to recur to the road-names. For the Irish *bothar* the corresponding Manx is *Bayr*. In the Isle of Man is a place called Baregarrow, which Mr. Moore interprets "rough road." On the Roman way between old Carlisle and Maryport, we have Bagrow ("Baggerah"), which may possibly indicate that the invaders found that bit of Roman paving more cobbly or more worn than usual. There is, however, a "Baggrave" on Watling Street in Northumberland. *Bayr* may also account for Barbon in Domesday, Berebrune, "the road-well," on the Maiden Way. Bardsey is in Domesday, Berretseige, *Bayr-hæds-egg*, the edge or cliff at the head of a road called the Red Lane, through Furness. And close to the spot where the road from Lancaster came upon the lands there was Bare (*sic* in Domesday). I think these names are hardly explained by the Icelandic *Ber*, in compounds *berja*, "berry," or by *berr* "bare"; so that we may, perhaps, consider *Bayr* as a loan word; and if so, not from Ireland, but from the Isle of Man.

In a third and final subdivision we must put two which are found neither in Norse nor in Manx, and yet may have been loan words borrowed by the Norse from the Manx. That is to say, words which must have been current in the ninth century which are now obsolete there and preserved only in place-names; and these words must have been brought by the Norsemen into Cumbria though not into Iceland.

9. *Glaise* is Irish for "stream," and Mr. Moore considers that its Manx equivalent was *glas*, in Douglas, "black stream." We may find the same word in Glasson and Glassonby (both *temp.* Hy. I.) and in Gleaston, the Glasserton of Domesday, Ravenglass (*temp.* Ed. I.) was Ranglass, a curious form, because most names in early writing become longer and fuller; this is an exception, surely not without cause. The old Nicolson and Burn derivation was *Renigh-glas*, "green fern"; but a much closer equation would be the Manx *Raun-glas*, "seal-river," nearer than the Irish *Ron-glaise*; and seals must have been common enough on that coast in the tenth century.

10. The Irish *boireann* is not found in Manx, except in a place-name, and not in Icelandic at all; but it seems to have been a loan word, judging from its occurrence in our dialect. It means properly, "rocky land," but, says Mr. Moore, "it is a name actually applied to an old earthen fortification."—Borrane Balebly. Now, in our district, *borran* is also used for rocky land in general, but as a proper name it attaches especially to land covered with ruins, e.g. Borrans Ring, the Roman camp at Ambleside; High Borrans, near Windermere, is close to the Hugill settlement; Low Borrans is near to the spot where the Roman road crossed Troutbeck. Indeed, the name is frequent on the track of the Roman roads (see, for example, Cornelius Nicolson's "Annals of Kendal"), while there are innumerable natural rocky places to which it does not attach.

There is a Borrans Hill House on Burns Hillside, near Subergham, which seems to show that *Burns* is *Borrans*. Barnscar can hardly be anything but *Borran-scar*, from the heaps of remains found there. Burnmoor, *borran-moor*, is a place where circles are found; Wyebourne is near a British camp, east of Shap; Garbourne is on the High Street, south of Ill Bell. In these cases we have the loan word compounded with a Norse element, and it may be suggested that "burn" in our district is frequently, if not always, equivalent to *borran*.

It has often been noticed that our dialect does not use "burn" for "stream," as in Scotland and Northumberland. "Burn," from *berne*, is an Anglo-Saxon word, not occurring in Norse, in which the nearest form is *brunnr*, "a well," as in the Icelandic proverb, "Late to bar the *burn* when the barn is fallen in," referring to a well with a gate, such as we see near old-fashioned cottages. The Scotch and Northumbrian "burns" were so named by Anglians two or three centuries before the Northmen settled our district. The old Norse word was *bekkr*, but this was antiquated in Iceland by the time the sagas were written, and even in the tenth century they used *lækr* for *bekkr* in local names. This shows that our district was settled and named, and that a local dialect of pre-Icelandic Norse was formed by the early part of the tenth century. We keep several words that the Icelanders lost. They had a proverb, "öl heitir með mönnum, en með Asum bjór"—"Ale is right with men, and with gods beer," meaning that "beer" was the ancient poetical word; ordinary folk asked for "ale." A parallel proverb said of barley, "*bygg* it is called by men, and *barr* by gods," *barr* being the older and less familiar name for the less productive sort, superseded by *bygg*. But, as we have seen, both words remain with us, in Bigland and Barton. Tilberthwaite, however, is not from "tilling beer," as some one has suggested, but from *Tjalds-borg-thveit*, "tent-fort-field," seen in Tildesburghthwait (*temp.* Ric. I.), like *Tjaldastadhr* (Icel.).

The use of old forms of writing is strikingly shown in the name Burneside, which used to be derived from *burn*, "a brook." It was written (*temp.* Ed. III.) Brunoleshefd, Bronolvishead; and (*temp.* Ed. I.) Brunoleshefd, Bronolvishefd. The valley of Sleddal Bronnolf, and one Roger de Bronnolf are mentioned (*temp.* Ed. I.) and Sleddal Brunholf (*temp.* Hy. III.), showing that Burneside (Burnishead) was named from some early settler *Brinölvi*, "the wolf-browed," a recognised Norse appellation. To the same name, if not the same person, may be referred Brunnelscroft, Middleton.

But in other "burns" the case is different. Greenburn is the valley that opens at the green borran, which has been identified by Mr. H. S. Cowper as our lake district Tynwald. "Greenburn-beck," not "Green-burn," is the stream that flows past it. So Wythburn may be properly not the name of the stream, but of the ground by which Wythburn-beck runs. "Wyth" is *vidhr*, "wide," like *vidhlendi*, "wide lands," &c.; or *vidhr*, "withy," like *Vidhidallr* in Ireland, "willow-dale." And the land is not only unusually rocky, but it is also traversed by a great Roman road, marked by the names Stanwick (*steinvegr*, "stone road" paved with boulders), and Stenkin Nook (Stanwick-ing, "meadow"); and there are traces of ruins which, at the time of the settlement, must have been striking enough in their extent to be called the "wide-borran," or so overgrown as to suggest the name "withy-borran." In a word, the original Cumbrian Norse dialect called our streams *bekkr*, or *á*, and perhaps sometimes *lækr* (as in Lickle for *lækjargil*?) but never *burn*, which is the Manx loan word *borran*; except in those outlying parts of our district where pre-Norse—i.e. Anglian—names survived.

These ten loan words, if the derivations be accepted, and in

any case the parallelism of so many Manx and Cumbrian place-names, illustrate the interest—it might almost be said the necessity—of going beyond the bounds of our own district to compare the antiquities of our neighbours; and they rivet new links in the chain of evidence which binds us to the Isle of Man in the history of a thousand years ago.

THE STRENGTH AND RESILIENCE OF STRUCTURAL CAST-IRON.*

THE working qualities of structural castings are of extreme importance, so much so that the necessity for these qualities goes without saying. Furthermore, these qualities can be tested, and are tested, of necessity in the finishing of the castings for service. Any failure of the working qualities is immediately discovered by the machinist and corrected by the foundryman. The strength and the toughness of the castings, however, are two qualities which are not usually determined at all except by such incidental indications of strength and toughness as come from the breakage of these parts in practice under loads or shocks which they were assumed to be able to resist. This indication is, of course, a very inadequate one, and gives at best no measurable test of the strength or toughness of the iron.

In this paper the author will undertake to show the necessity for these qualities, and how they may be determined by actual tests. He will further try to show that strength and toughness are not identical, and that the one does not give any indication of what the other may be. Thus, a very strong iron may be a very brittle one, and, on the other hand, a very tough iron may be comparatively weak.

The Strength of Cast-iron.—Cast-iron is not usually used in structures to carry tensile stress alone, but generally used for columns and beams. In machinery castings, however, where all the parts are made of cast-iron, some parts are subjected wholly to tensile stress. There are three kinds of strength therefore of cast-iron, which may be determined by actual tests, namely, tensile strength, compressive strength and strength in cross bending, as a beam. When a cast-iron beam or any cast-iron form is broken in bending, the fracture always occurs on the tension side of the member, and hence the failure is one in tension. In the case of cast-iron columns, provided the load is symmetrical and the column is equally strong on all sides, the failure would be one in compression. It so happens, however, that the tensile strength of cast-iron is a good measure of both its cross-bending and of its crushing strength—that is to say, that cast-iron which is strongest in tension is likely to be strongest in compression and in cross bending. All kinds of strength of cast-iron therefore may be determined by a tension test. It may also be determined by a cross-bending test. The tension test has one advantage over the cross-bending test, inasmuch as the whole length of the tension test specimen is subjected to the same stress, and if there be a flaw anywhere in the entire length of the specimen, failure will occur at that point, and hence the weakness of the specimen will be shown wherever this weakness may occur. In cross-bending tests, where the bar is loaded in the middle, the tendency to break is greatest at the centre, where the load is placed, and if a flaw occurs near one end, it would not be discovered by the bar rupturing at that point. Hence we may say that the tension test is a better test to discover any possible flaws which may be in the specimen, but the cross-bending test is probably better for determining the strength of the metal, since, in the latter case, the rupture must occur near the centre of the beam, and if this portion of the beam be free from flaw the true strength of the metal is determined. It is also much easier to make a test of cast-iron in cross bending than in direct tension, and furthermore a cross-bending test furnishes the means of determining the toughness of the iron, as will be explained later, and therefore in what follows cross-bending tests will be taken as a standard method of determining both the strength and toughness of the iron.

Cross-bending Tests.—The most convenient form for a test specimen of cast-iron for cross bending is a rectangular cross section about 24 inches long. The size of the cross section should have some relation to the thickness of the webs or parts in the structural forms into which the metal is run, and for the strength of which the tests are made. Thus, if the iron is to be used in forms where the thickness of the metal is about 1 inch, the test specimen should be made about 1 inch square. If, however, the metal is to be used in parts the thickness of which is not more than $\frac{1}{2}$ inch, then it would be well to make the test specimens $\frac{1}{2}$ inch thick and perhaps $1\frac{1}{2}$ to 2 inches wide.

In the case of stove iron the test specimens should not be more than $\frac{1}{4}$ inch thick and about 2 inches wide. The length of the specimen is immaterial, and should be such a length as

is adapted to the testing machine or apparatus. The cross section of the test specimen should, of course, be uniform from end to end; that is to say, it is of the same size throughout.

The same care should be taken in the moulding and casting of test specimens as would be taken in any regular casting where sound and perfect work is desired. It would usually be cast horizontally, but with due precautions, as in the interception of the slag, in the escape of the air, in the smoothness of the sides and the perfection of the corners. It should be so moulded as to free itself readily from the sand, and should be tested without planing down.

In testing such a bar it should be supported on knife edges near the ends, these knife edges being at a definite distance apart. The distance between these knife edges being the length of the beam, so far as the test is concerned, any overhanging ends of the specimen beyond the bearings have no effect on the strength of the beam. This specimen is then broken by placing a load at the centre, preferably by means of another knife edge, and this load applied slowly and uniformly and without shock. About the only way to do this properly is by means of a screw turned steadily and very slowly. There are various cross-bending testing machines on the market, the principal ones being manufactured in Philadelphia. The modulus of rupture of cast-iron in cross breaking corresponds to the tensile strength of the iron, and if the iron were perfectly elastic up to the point of rupture this modulus of rupture would be the same as the tensile strength in pounds per square inch, but since cast-iron takes some permanent set before it breaks, the theoretical formula no longer applies, so that the computed modulus of rupture as determined from cross-breaking tests is found to be always very much larger than the true tensile strength of the cast-iron, its average value being from one and a half to twice as much as the strength per square inch in tension. If the cast-iron has a tensile strength of 2,000 lbs. to the square inch, its modulus of rupture in cross bending will be therefore from 30,000 to 40,000 lbs. It is common to assume that a tensile strength of 20,000 lbs. corresponds to a cross breaking strength or modulus of rupture of about 36,000 lbs. per square inch. To find this modulus of rupture from a cross-breaking test on a rectangular bar we use the following simple formula:—

$$f = \frac{3}{2} \left(\frac{Wl}{bh^2} \right)$$

where f = modulus of rupture in cross bending in lbs. per square inch, W = load at centre of beam in lbs., l = length of beam between bearings in inches, b = horizontal breadth of beam in inches, h = vertical height or depth of beam in inches.

It is much better to use this formula and compute f from the cross breaking weight W , and the dimensions of the bar b , h and l , than to use some thumb rule, as, for instance, that a bar 1 inch square and 12 inches long should carry a load of 2,000 lbs. at the centre. This would give a modulus in cross breaking of 36,000 lbs., which indicates a very fair quality of cast-iron, so far as strength is concerned, but if the specimen should prove to be a little more than 1 inch square, or a little less, there is nothing in the specification to show by how much the loads should vary to compensate for this change of size. Whereas, if it be specified that the modulus of rupture should be 36,000 lbs., that could be determined from the above formula very easily whatever the dimensions may have been. In fact, b and h should always be measured to the nearest 1-100th inch, and, of course, the castings could not be made of any given size to anything like this degree of accuracy.

In all cross-bending tests of cast-iron some means should be provided for accurately measuring the deflection of the bar up to the point of rupture. This can only be properly done by the aid of some kind of attachment to the testing machine itself. These deflections should be measured to the nearest 1-100th inch. The use of the deflection is to enable us to compute the resilience or elastic spring of the iron, as will be explained below.

Resilience of Cast-iron.—Resilience is a scientific term which signifies the toughness or the ability of the material to resist a shock or blow. It is not strength, neither is it deflection, but it is a property representing these two qualities combined. Thus if the total breaking load be multiplied by the total deflection of the beam, and this product divided by two, the result is the resilience of the beam in inch pounds, provided the load were measured in pounds and the deflection in inches. This product varies directly with the form and volume of the beam, irrespective of its dimensions, so that if the half product be divided by the total number of cubic inches in the beam, the result represents the resilience of the iron for a rectangular beam in inch pounds per cubic inch of metal. This is an absolute measure of the resilience or toughness of the iron, but it is easier to weigh the specimen than it is to compute its volume in cubic inches. Hence we may find the resilience of a rectangular beam per pound of metal by dividing the total resilience by the number of pounds in the specimen, just as before we found it per cubic inch by dividing by the number of cubic

* A paper read by Professor J. B. Johnson, of St. Louis, Mo., before the Foundrymen's Association.

inches in the specimen. The writer prefers this latter method, and therefore he recommends the following:—

RULE.—Multiply the breaking load in the middle of the beam by its deflection at the time of rupture and divide the product by twice the weight of the beam in pounds.

The result should be not less than 20 for ordinary cast-iron, and may be as high as 50 for the best quality of refined cast-iron, such as is commonly known as gun metal. For a very good quality of machinery castings, or such as should be used in railroad work, car construction, car wheels and the like, where the metal is subjected to severe shocks and blows, a result obtained as above of not less than 30 should be required. For stove iron a result not less than 40 should be specified.

In using the above method of making tests and computing the resilience of rectangular cast-iron bars there is no necessity of carefully measuring the cross section of the bar or its actual length. It should, however, be supported very near its ends, if the whole weight is to be taken in computing the resilience. It is also necessary to measure the deflection accurately. The only data, therefore, which need be taken are the weight of the bar in pounds, the breaking load in pounds and the deflection in inches. Applying the above rule to this data, we obtain at once the measure of the toughness of the iron, which has been described as including both the strength and the deflection. If it is desired to know the strength alone, then it is necessary to measure the length, breadth and height, and compute the strength per square inch by the formula—

$$f = \frac{3}{2} \left(\frac{WL}{bh^2} \right)$$

This value of f is called the "modulus of rupture" in cross breaking, and is about $1\frac{1}{2}$ times the real tensile strength.

Tension Tests.—In all tests of cast-iron in tension the specimen should be cast round, free from all defects, and then turned down in a lathe throughout its entire length, the middle portion being reduced to a somewhat smaller diameter than the ends. It is necessary to turn down the end portion in order to allow the specimen to fit the grips perfectly, and the middle portion should be made somewhat smaller to insure against breaking in the grips. If the specimen be made $1\frac{1}{2}$ inches in diameter, and the rough casting turned down to $1\frac{1}{8}$ inches at the ends, and the middle portion reduced to 1 inch in diameter, we would have the ideal tensile test specimen for cast-iron. The reduction from the end to the middle portion should be by a curved shoulder and not by an angular offset, in order to prevent rupture at this point. The specimen should be some 12 to 16 inches long, and the ends which are gripped should be left about 3 inches long, the remaining portion being turned down to the uniform diameter of 1 inch. Such a specimen can only be broken upon a regular tension testing machine, such as few foundries have in their outfit, and hence these tests are not so well adapted to common practice as the cross-breaking tests described above.

Cross-breaking Testing Machines.—Several concerns manufacture cross-breaking testing machines which give indications of the deflection, such as are required in the application of the rule given above for determining resilience. In these tests it is very necessary that the load be put on slowly and with perfect uniformity, and this is accomplished in all these machines by means of a screw. Every foundry which undertakes to turn out a first-class grade of cast-iron should have one of these cross-breaking testing machines in its outfit, and should study the character of all its mixtures by means of such tests as have been described in this paper, these tests being for both strength and resilience.

It must be noted that both the strength and the resilience can be determined from the same test. Having measured the length, breadth and height of the bar, and determined the breaking load, we can compute the breaking strength as described above; also having weighed the bar and determined its breaking load and its deflection, the resilience in inch pounds per pound of metal can be determined so that a single test in cross breaking fixes both the strength and the resilience or toughness of the iron. It must not be forgotten that these two qualities are entirely distinct, and must not be mistaken the one for the other. Thus, one mixture may be very strong and brittle, and another comparatively weak, but very high in resilience. It is not impossible, however, to obtain both great strength and high resilience from the same mixture, and this, of course, is the ideal kind of cast-iron. Such iron offers the greatest resistance, both to dead loads and heavy strains, and also to such shocks and blows as it may receive either in actual practice or from some accident.

Because the resilience of cast-iron has not heretofore been commonly studied or even thought of as a measurable property is no reason why it should not be carefully examined into. This term is now coming into common use, and practical men must accustom themselves to its use and understand its meaning. If a manufacturer of cast-iron would obtain one of the testing machines described above and carefully attend to the tests for resilience, and compare his results with his mixtures, he could

soon convince himself of the significance and importance of the resilience tests, and would probably never consent to grope in the dark in regard to the qualities of his products, as nearly all foundrymen have been accustomed to do. The character of his iron would then be no longer a matter of opinion, but would be determined absolutely, so that the proprietor could judge for himself of its quality from these tests, and not have to rely implicitly upon the mere opinion of his foreman or superintendent. Furthermore, such tests as these cost very little, and any intelligent workman or clerk can be taught to make them and the accompanying computations.

To make such tests valuable a test record-book should be kept, in which the mixture should be put down and the results of the tests alongside, and these carefully preserved. Such a record-book of mixtures and corresponding tests would soon become of great value as part of the capital stock of the concern, and this knowledge would not disappear from the establishment when the superintendent took his departure, neither would there be any personal element in it, and it would in no sense be a matter of opinion, but would be an absolute measure of the quality of the iron resulting from certain mixtures, which knowledge would be the common property of the entire establishment. There is probably no other way in which a small sum of money can be made to produce such valuable and permanent results in the carrying on of any foundry as in the making of such tests as here described, and the careful preservation of the records.



Drinking Fountains.

SIR,—I am desirous of knowing the locality of a drinking fountain with clock tower above in good Gothic style. If any correspondent will be kind enough to give information as to where any such may be seen it would greatly oblige.—Yours obediently,
W. M.

GENERAL.

Mrs. Long, widow of Mr. Edwin Long, R.A., has offered to the city of Bath, her husband's native place, his picture, *The Raising of Jairus's Daughter*, which is valued at about 5,000*l*.

Canon Wise, a Cornish clergyman, a large contributor to the Truro bishopric and cathedral funds, has given a donation of 5,000*l*. towards the erection of Truro Cathedral nave.

M. Alfred Delaunay, whose etchings of French cathedrals and views of Old Paris have been appreciated, has died at Nanteuil in his sixty-fifth year.

A Statue of the late Sir William Pearce, the shipbuilder, by Mr. Onslow Ford, A.R.A., was unveiled in Govan on Saturday by Lord Kelvin. The money was subscribed by the shipbuilding and engineering operatives of the district.

The Late Mrs. Lyne Stephens bequeathed three pictures to the National Gallery and some rare examples of old furniture and china to the South Kensington Museum.

The Old Palace of the Bishops, in Neville's Court, Fetter Lane, Chichester, is about to be demolished.

Mr. Woolrych Perowne has obtained promises of lectures to the members of his educational tours to Rome and Palestine from Mr. Oscar Browning, Canon Evans, Professor Lanciani, Mr. Bliss and others. The Bishop of Peterborough will lecture on "Rome of the Renaissance" and "The Influence of the Popes on Roman Architecture."

The Rebuilding of the Institution of Civil Engineers will not affect the place of meeting, as such arrangements have been made as will allow of the theatre and reception-rooms under it being retained for use during the approaching session.

General Moberley has been appointed by the London School Board as their representative to attend the conference proposed by the Architectural Association, for the purpose of considering the question of the practical training of London workmen engaged in the building trades.

A Picture by Mr. J. Coutts Michie, A.R.S.A., *Sunshine and Shadow*, which was exhibited at the Royal Scottish Academy, has been purchased for one of the Vienna galleries.

Mr. Cranage is delivering a course of lectures on "Gothic Architecture in England" at the Subscription Library Lecture Hall, Sunderland.

The Aberdeen Art Gallery have received gifts of busts of Scott and Burns from Mr. D. W. Stevenson, and of the civic badge and chain of office belonging to the Provosts of Old Aberdeen, from ex-Provost Sinclair.

The Architect.

THE WEEK.

THE ozone or some other element in the air of seaside towns must be a wonderful disinfectant, for the defects which are found in many of them if they existed elsewhere would be fatal to the inhabitants. Only a few years have elapsed since a drainage system was introduced in Margate, and although the town was overcrowded during a part of every year the death-rate was rarely abnormal. The latest revelation of defects comes from Eastbourne. That fashionable watering-place has not gained favour without the expenditure of enormous sums of money on its improvement. About a year ago a sum approaching 30,000*l.* was expended on drainage. It is, however, far from being considered perfect. The report which Mr. HENRY LAW has prepared for the Town Council is convincing that the drainage is altogether inadequate, and that an outlay of 75,000*l.* must be faced. It might be imagined from reading the document that by some error the original plans were reversed, for the main drains instead of having increased diameter as they approach the outfall become diminished. One of them, which near the railway station has a calculated discharge of 6,258 cubic feet per minute, at the outlet has a capacity of only 915 cubic feet. It is no wonder that in the low-lying portions of the town the houses are often flooded.

THE Thirlmere Waterworks are not complete, but a conduit extends from the lake to Manchester, and since Saturday last a supply is available in the city. When the difficulty of obtaining water in Leicester is considered, as well as the inconstant quantities on which other towns have to depend, the people of Manchester have reason to congratulate themselves on the possession of a reservoir which will enable them to be indifferent to the driest weather during at least four months. The works have, no doubt, cost a large sum, but the blessings which a daily supply of 75,000,000 gallons of water can confer would by Londoners at least be considered cheaply purchased for three millions of money. Birmingham is expending a larger sum on a supply which will need the transformation of the Elan Valley into a reservoir to contain it. It may be asked, When is London's turn to arrive? The question, Where is a supply to be discovered? deserves prior consideration. The affluent catchment basins that are suitable are being seized by provincial towns. No doubt they are securing far larger quantities of water than will ever be needed for local purposes. That, however, will be no consolation when London discovers it must share the fate of the last comer in the scramble for water.

DURING their visit to St. Mary's Church, Long Stratton, the members of the Norfolk and Norwich Archæological Society were able to examine one of the two examples (the other is in Yaxley Church) of a "sexton's wheel" which remain in England. It is an open iron dual wheel 24 inches in diameter; each wheel is divided into eight sections, and each section adorned within on the periphery with a fleur-de-lis. Both wheels are bound together on one short axle, from which run narrow shafts to the circumference to meet in the handle by which the instrument was held. The Rev. W. H. SEWELL explained that this wheel was in former times occasionally used to determine the day from which to begin keeping the Lady Fast. There were two kinds of fasts observed in honour of the blessed Virgin—one movable, the other immovable. The latter was kept every Saturday. TYNDALL referred to the Lady Fast in his Exposition of St. Matthew, and to that allusion the Rev. HENRY WALTER appended a note, explaining that the Lady Fast seemed to have been a species of penance, whether voluntary or enjoined, in which the penitent had the choice of either fasting once a week for seven years on that day of the week on which Lady Day happened to fall, beginning his course from that day, or of finishing his penance sooner by taking as many fasting days together which would amount to one whole year. There were six Lady Days in the year—the Con-

ception, December 8; the Purification, February 2; Annunciation, March 25; Assumption, July 2; and Nativity, September 8. On which of the Lady Days was a person to begin fasting? Recourse was either had to lot or to the sexton's wheel, and a string was fastened to each of six holes, three in each wheel, to indicate the six Lady Days on which fasting was to commence. When the wheel was revolving the person who wished to consult it had to try and catch one of the strings. Bent radii in each wheel prevented their making a complete revolution. KIRCHMEYER, in a Latin poem, said:—"They keep a fast to MARY on a solemn day, which a wheel turned round and a thrown lot indicate; for every sexton hangs up his wheel in a church, marked round about with five or six days and with feasts throughout the whole year sacred to MARY. From each there hangs a long string to catch. If, therefore, a devotee of MARY comes and desires one day of the six to be given him by lot, the sexton makes the wheel revolve and bids the person catch the string as it goes round. Thus he knows the day on which to keep his stated fast." It might be supposed that from the time names were given to the days of the week men would be able to remember one of the seven, but the strange wheel or roulette-table was employed, we suppose, from a lurking belief that invisible powers would be interested in the selection of a fast-day and determine the most suitable.

ACCORDING to the latest papers received from Australia, a difficulty has arisen about the conditions of tendering for the proposed markets in Sydney. In order to see the plans and to be allowed to tender it was necessary for a contractor to pay a deposit of 300*l.* Another deposit of 2,000*l.* was to be sent with the tender. In addition, the successful competitor would have to enter into a bond for a sum equal to 5 per cent. on his tender. The members of the Builders and Contractors' Association are divided in opinion about the merit of the conditions. Some believe the deposits will have a prohibitive effect and enable one or two contractors to monopolise the work of the colony. Others maintain that at present a contractor often puts down four or five names of men as intending to compete, in order that he may have possession of the plans for an extraordinary time. By insisting on a large sum as deposit the Corporation were also likely to insure more careful tendering. A majority considered there should be a remonstrance, and a deputation accordingly waited on the Mayor. It was anticipated that some modification of the conditions would be approved.

MR. J. L. ROBINSON, R.H.A., who died on Friday last at Dalkey, co. Dublin, was distinguished among the Irish architects by his desire to co-operate with his English brethren. He was, we believe, the son of a photographer, and few amateurs possessed so much dexterity in the process. Year after year his skill was at the service of the members of the Architectural Association in their annual excursions, and in numerous other ways he displayed a willingness to serve. Mr. ROBINSON's name has been therefore familiar to architects throughout England, and he was respected by all who met him. In Ireland he gained esteem in public life, for he was from his training one of the most useful members of the Dublin Corporation, and he was for a long time chairman of the Kingstown Commissioners. Mr. ROBINSON was fortunate in obtaining the support of the Roman Catholic authorities, and several convents, colleges, hospitals, schools and charitable institutions were erected from his designs. He was in the prime of life, and his friends were justified in the expectation that there was a long and prosperous career before him.

THE first volume of the third series of the Sketch-book of the Architectural Association is about to be issued. During the past quarter of a century the Sketch-book has been most useful, both from the subjects of the plates and the opportunities which they furnished for friendly competition among the members of the Association. The new series will, we are confident, be no less serviceable, and we wish it success. The editors are of course desirous to have all the support they can obtain, in order to avoid the possibility of loss, and it would therefore be advantageous if intending subscribers signed the forms without delay.

BENVENUTO CELLINI.*

WHEN GOETHE decided upon a journey to Italy—he was then in his thirty-seventh year—he prepared himself for the understanding of the Renaissance period and its artists by a translation of the autobiography of BENVENUTO CELLINI. It was characteristic of GOETHE to endeavour to put himself in the place of a Renaissance master and to look at Italy as it were through the eyes of a man of the sixteenth century, and for that purpose there could be nothing more aidful than the book of the Florentine goldsmith. He might be called the ODYSSEUS of Art. CELLINI could well say of himself:—

Much have I seen and known; cities of men
And manners, climates, councils, governments,
Myself not least, but honour'd of them all,
And drunk delight of battle with my peers.

He was not one of the most illustrious men of the age of gold. It would be absurd to rank BENVENUTO with DA VINCI, MICHEL ANGELO or RAPHAEL, with BRAMANTE, BACCIO DELLA PORTA, TITIAN, VERONESE and others. He must stand on a different plane. But he saw more of the varieties of Renaissance life than greater artists, and from the value of the description he gives of the scenes in which he was an actor he has gained an amount of fame to which his works in metal did not entitle him. GOETHE could easily have grasped the character of the autobiography by one or two perusals, but he wished to utilise every sentence as a test of his knowledge, not merely of language, but of art and history. There were not many examples of Renaissance art available in Weimar for the elucidation of CELLINI's words, and with all his stoicism GOETHE owns that he suffered positive pain when day after day he discovered that a great part of the text was meaningless for him from that deficiency. GOETHE was too much of a realist to be satisfied with vague notions of the meaning of words. At all costs he insisted on knowing the things which they represented. Accordingly, when he heard there was to be an auction of Italian medals and coins in Nuremberg he bought the whole collection in the hope that some of them would serve his purpose. There were hundreds of examples, but unfortunately not one was modelled by CELLINI. The failure stimulated GOETHE to further exertions, which long before he attained acquaintance with CELLINI's work made him happy, for, as he said, in that way he laid the foundation of a branch of knowledge that was quite new to him. GOETHE's example suggests what can be done by any earnest student who cares to "get up" a book thoroughly. It may not be a work of genius, but it can be made to serve, like the bolsters and mattresses of the pugilists, to develop power.

CELLINI's book exemplifies that defects are often more serviceable to the world than virtues. Probably there never was a man who was more conceited. If he possessed the self-knowledge which the moralists recommend, he must have known that he was neither a great nor a good man. In that case not a line of the autobiography would be composed. Fortunately for posterity, he was so overmastered by vanity he imagined that all the world then and afterwards must be grateful for records of rowdyism, beside which the crimes of galley slaves appeared trivial as school-boys' faults.

If it be asked why the autobiography should meet with a fate that is different from what awaits similar accounts of bad men's lives, an explanation is not difficult to find. CELLINI, as we have said, was not one of the great artists, but he was vain enough to believe he was their peer. Accordingly, he assumed that he was entitled to all the consideration which was awarded to his superiors. In his case the insisting on the dignity which belonged to DA VINCI or FRA COLONNA became absurd as MALVOLIO's, when his self-exultation made the household imagine he was turned heathen, a very renegade, "for there is no Christian that means to be saved by believing rightly, can ever believe such impossible passages of greatness." But the arrogance and presumption of CELLINI enable us to realise how much respect awaited artists in the sixteenth century. He was often so intolerable in courts, it was proposed as the only remedy to have him executed. That was partly in

jest, but it reveals how much it was necessary to endure for the sake of utilising such ability as he possessed.

His opinion of his own worth becomes evident from all his pages. Once in Florence there was a difference between him and the steward of COSMO DE' MEDICI about a house. Says CELLINI:—"I told him that such men as I were worthy of speaking to Popes, Emperors and mighty monarchs; that there was perhaps but one such as I in the world, whereas there were dozens such as he to be met with in every corner." In Rome, Mantua and Paris he made the rulers aware that he was no less assured about his supremacy in the arts, and they all meekly accepted his valuation of himself. It was only necessary for him to suggest that, as other parts of Europe were anxiously awaiting his coming, he could not complete the work he had undertaken for some Prince or Pope, and at once the highest were compelled to succumb. His dealings with the Popes were on the whole the most amazing of his impertinences. His passion was excited by any trifle. Like BENVOLIO, he was ready to quarrel with a man who in coughing waked a dog, and then he would slay or kill the offender without any hesitation. On one of those occasions Pope CLEMENT ordered that BENVENUTO should at once be arrested and hanged where the deed was committed. The artist kept quiet for a few days and completed a medal he had in hand. He then went to the Pope, who was in the Belvedere with several noblemen of the first rank, and presented the impressions like any guileless artist. The Pope's love of art overcame his sense of justice, for he asked an attendant, "Were the ancients ever as successful in striking medals?" CELLINI thereupon improved the occasion by delivering a homily to His Holiness on the necessity of restraining his temper. Referring to the order for his execution, he said, "I make no doubt your Holiness would have felt remorse for the loss to yourself; but neither parents nor masters possessed of prudence or good-nature will ever suddenly resort to severities against their children or servants, for they know that subsequent repentance will be of no avail for what was done in passion." It is easy to imagine the poor Pope's confusion at the scene, and it is no wonder that when another charge of assassination was brought against CELLINI, he should endeavour to get out of the difficulty by saying that men who are masters in their profession, like BENVENUTO, were not amenable to ordinary laws.

The fact was the Pope, equally with the rest of the Italians, was as much under the sway of art as if it possessed magic power. The first important commission which CELLINI received from CLEMENT VII. was a clasp for a cope. Two or three times a week the Pope required to see it while in progress. Before it was completed the jeweller found an opportunity to satiate his revenge on a musqueteer, who in self-defence had fired on CELLINI's brother. After the deed he found refuge in one of the Roman palaces and was advised to complete the clasp. When it was ready CELLINI carried it to the Pope, who, as he relates, "frowned on me very much, and with angry looks appeared to reprimand me; but on seeing my work his face became serene, and he praised me for doing so much work in a short time; then, looking at me significantly, he added, 'As you have recovered your health, take care of yourself.'" But the pontiff showed still more eagerness about a chalice which he intended to use in the grand religious processions. CELLINI prepared a design showing the cup supported by figures of Faith, Hope and Charity, and around the base were reliefs of The Nativity, The Resurrection and St. Peter's Martyrdom. The artist was anxious to produce a fine work, for he expected it would obtain for him the office from which SEBASTIAN the Venetian was soon to obtain the cognomen "Del Piombo." The Pope was afraid CELLINI would lose the spur to exertion and the chalice would not be completed. He therefore kept the appointment open. The artist became impudent and the post was given to SEBASTIAN. But the kindly CLEMENT promised to bestow the next lucrative appointment that was vacant on BENVENUTO, if he had carried out the commission. The jeweller became sulky and declared the Pope's promises were not to be trusted. Every day an officer was sent to inquire into the progress of the chalice, and was put off. When the Pope left Rome for Bologna, one of the duties entrusted to the Cardinal

* *Les Artistes Célèbres: Benvenuto Cellini.* Par Emile Molinier. Paris: Librairie de l'Art.

Legate was to look after CELLINI's work. The Cardinal was of the old despotic school and threatened to send BENVENUTO to the galleys, where he would be compelled to finish the chalice. That was enough for the artist, and he declared he had done with the job. When the Pope returned he lost no time in ordering CELLINI to appear. The disappointment of CLEMENT can be fancied, and he was to be excused when he threatened to have jeweller and chalice thrown out of the window. CELLINI justified himself by saying he suffered from ophthalmia, which was the consequence of being threatened with the galleys by the Legate. That prelate was appointed to Parma, probably for his indiscretion, from whence he sent another goldsmith (a coiner he had rescued from the flames), who was supposed to be a genius and more than competent to complete the chalice. The Pope accordingly ordered the work to be given up to him, but CELLINI refused to part with his property. He was next taken prisoner. The chalice was seized. Then it was returned to the artist and the Pope promised to grant any favour he would ask if he completed it. Many other complications followed, but CLEMENT was not to be made happy by once clasping his chalice.

A man who was able to defy the Pope in Rome need not be afraid to encounter other princes, and CELLINI was in no place afraid to indulge his wayward spirit without any limit, as if he were above all earthly powers. When FRANCIS I., after the exercise of much diplomacy, believed he was fortunate in alluring him to France, he gave him a commission for six gods and six goddesses, which were to be formed of silver and exactly of the king's height. After a time CELLINI lost interest in the figures. There were influential enemies opposed to him, but FRANCIS continued to be his friend. Circumstances however compelled the king to expostulate with CELLINI, and what he said enables us to understand the troubles which awaited all who attained the privilege of attaching Renaissance artists and scholars to their courts. According to the autobiography FRANCIS said, "Is it not remarkable, BENVENUTO, that men of genius of your class are not aware of your incapacity to display your powers without our help and the opportunities we create for that purpose? That recollection ought to diminish your pride and obstinacy. All I desired of you were twelve silver statues. You preferred to produce a salt-cellar, vases, heads and a thousand other fancies of your own, as if you were only to gratify yourself. I shall be compelled for the future to insist on obedience, and if you are obstinate in giving way to your whims you will be running your head against a wall." CELLINI adopted his usual course of surprising the king by a sight of works that were unexpected. He also employed language that was, as he says, a mixture of pride and haughtiness with humility, and of course asked for permission to return to Italy. FRANCIS was thunderstruck, and offered to smother CELLINI with gold if he would only carry out what he promised. But the artist knew his strength and went back to Italy.

It now seems remarkable that so much was borne from a man who was after all only a goldsmith. Some other members of the craft had become most able painters and sculptors. But CELLINI was not possessed of the strength that was required for high flights. The relief in bronze of the reclining *Diana* or *Nymph* which is now in the Louvre may, we suppose, be accepted as an average specimen of the works he executed for the French monarch. KUGLER considers it to be executed with delicacy and elegance; they are the qualities in which it appears to be deficient. To make a sort of nymph out of a woman who, with the exception of a wreath and a sort of bridal veil is nude, and to surround her with swine and other animals, while she reclines on a waterproof sheet by the side of a stream is no great effort of imagination. The figure is not refined in the contours. The most that can be said in favour of the work is that the lunette has no space to let. That a goldsmith whose experience was confined to works on a small scale should be competent to undertake so large a piece of metal-work was most creditable to him. We must remember also that in those days there were no technical institutes or treatises where the mysteries of casting life-size figures were expounded. CELLINI's instruction was derived from what took place in the workshops of ordinary goldsmiths, for he does not mention any instance when work of

a different class was entrusted to his masters or employers. He aspired to be more than a mechanic, for he made drawings after MICHEL ANGELO's *Battle of Pisa* when an apprentice in Florence, and in Rome he made use of the paintings in the Sistine and in the Farnesina. But when PORZIA CHIGI, on seeing his drawings after RAPHAEL, inquired whether he was a painter or a sculptor, CELLINI replied that he was a goldsmith and then was entrusted with some jewels to set. That he was sometimes considered to be only a mechanic is apparent from his treatment in Mantua. He was recommended by GIULIO ROMANO to the Duke, who at once gave CELLINI an order for a little shrine to hold a reliquary, but asked the painter to prepare the design. GIULIO replied that BENVENUTO was competent to dispense with another artist's design. The circumstance suggests that the goldsmith's fame was unknown except to a few patrons. The general opinion among artists may have been expressed by BACCIO BANDINELLO, when the sculptor suggested that CELLINI, like other goldsmiths, kept a "ghost" to do the designing.

As far as we have been able to make out, BENVENUTO CELLINI prior to his visit to France was not able to obtain a commission for a single work that could not be easily carried in the hand, and was not recognised as a sculptor in the ordinary acceptance of the word. The French Monarch, we suppose, imagined, like many of his contemporaries, that it was as easy to work on a large as on a small scale, and as CELLINI's sketch-models were likely to be more finished than those submitted by sculptors, it was concluded that the completed work would also be superior. The statuette of the *Perseus* which is in the Florentine Museum is suggestive of a nobler figure than is to be seen in the Loggia; the little model in wax is still finer, and there may have been as great a difference between the sketches and the sculpture produced for the French king. FRANCIS risked much, and it was fortunate he was not compelled to endure any disappointment from so hazardous an experiment, which would bring his judgment in question. That his taste was not very refined is evident when we learn how he considered CELLINI's *Jupiter* was vastly superior to the reproductions of the masterpieces of antique sculpture which were placed near it.

In Italy CELLINI was prized as an artist whose jewellery popes, princes and princesses were proud to wear. They were also willing to submit to his caprices for the sake of the ornaments he was able to produce, and which were always delicate, in spite of the sanguinary work that so often occupied the jeweller's hands. In France there was less discrimination, and in consequence CELLINI appeared as a sort of demigod to the king. The belief in his omnipotence is apparent not only from the orders for big statues, but from the singular commission by which BENVENUTO was entrusted with the fortification of Paris. It is true he was not allowed to execute the work, for court influence was too powerful against him, but the fact remains that FRANCIS was prepared to leave the defence of his capital to a man who, although the son of an architect, never assisted construction. His plausible talk on military subjects captivated FRANCIS I., and it was no less effectual with COSMO I. afterwards, for the Duke abandoned an approved scheme for fortifying one of the gates of Florence, and substituted CELLINI's, although it was incomprehensible to old soldiers.

The assurance which made CELLINI pose as a military engineer and undertake works beyond his abilities brought punishment with it. He left France in the hope that a few days' absence would compel FRANCIS I. to value him more highly. But the king was becoming wearied with an artist who involved him in "scenes" with Madame d'ETAMPES, and whose projects were too colossal for his treasury. FRANCIS was six years older than CELLINI, and as his strength was declining he must have felt that he was not likely to see the completion of figures which were to be of unprecedented dimensions. His "Foi de Gentilhomme" was, however, sufficient to insure profitable employment to the artist. CELLINI was not satisfied unless his liberty to create was uncontrolled. He asked for a holiday, and the king said to him, "BENVENUTO, you are a great fool," which was as accurate a judgment as could be expressed. They were the last words of FRANCIS, and CELLINI was free.

He anticipated, we suppose, that his prestige would

overcome his fellow-citizens in Florence. The Duke was willing to have CELLINI attached to his court, for he could be made useful, and COSMO was resolved that the outlay on account of him must be insignificant. To the officials of the court and to the citizens BENVENUTO was as unimportant as a prophet in his own country. He might believe he was the descendant of that FLORENTIUS who was CÆSAR'S companion in arms and gave his name to Florence. They remembered him as the apprentice of MARCONE, the goldsmith, as a youth who was turbulent and banished for misdeeds more than once. CELLINI wished the world to forget he was a jeweller. His ambition was to appear as the successor of DONATELLO and MICHEL ANGELO. The duchess and courtiers found pleasure in thwarting his schemes. COSMO was indifferent: all he cared for was to acquire the reputation of being a princely patron of art on economical terms, and as he paid BENVENUTO only about one-sixth the value of his works, and gave the money in instalments, he could hardly expect to find a cheaper artist. The relation which CELLINI gives of his later years in Florence becomes saddening. He imagined he was one of the shrewdest of Italians; yet he was cheated by the Duke, cheated by his banker, cheated by peasants, nay, by everybody, as if he were a simpleton. It was harder to bear, perhaps, that the man who defied the laws in so many capitals, whose threat was a death-sentence, was treated by the magistrates as if he were the humblest of the citizens. In his account-book we find the following record:—"On to-day, 26 October, 1556, I, BENVENUTO CELLINI, came out of prison, and I have entered into a truce with my enemy for a year. Each of us had to furnish bail of 300 crowns." It recalls old CAPULET'S remark, "But MONTAGU is bound as well as I, in penalty alike." And in both cases the words mark the close of an era when men could enforce their own laws. Is it any wonder that soon afterwards poor BENVENUTO admitted to himself that he was "a great fool," and took the preliminary steps to abandon the world and enter into Orders, a transformation which was not to be completed, for he returned to the secular state and married a wife? It was a prosaic ending for so strange a life. BENVENUTO CELLINI died of pleurisy on February 14, 1571, being then in his seventy-first year.

It is not an easy task to write about a man whose autobiography gives him a better claim to remembrance among mortals than the half-dozen works in metal by him which have survived. M. MOLINIER has shown fine tact in what he has done, and a reader will find it is easier to follow his memoir than the original autobiography. His reserve, shown in not accepting countless examples as CELLINI'S work, in spite of dealers and museum keepers, is also creditable. But for all who care to understand the relations between the artist and his contemporaries, BENVENUTO CELLINI must always remain the best of expositors.

REGULATIONS FOR THE PRESERVATION OF ANCIENT BUILDINGS IN ITALY.

Translated by JOHN HEBB.

1. THE entireness of a building extends *in limine* to that portion of it which remains, as well as to any traces which may indicate original portions which have been destroyed. It follows, therefore, that in the ordinary course it is not right to proceed to the rebuilding of destroyed portions, inasmuch as such rebuilding may interfere with the study of, or the imaginary completion of the building, and may prevent the recognition of the original portions.

2. The renewal or substitution of portions, even if of secondary importance, of an architectonic building should only be employed as an extreme measure in order to preserve what remains, and should therefore be restricted to those portions which no longer fulfil their specific purpose or can no longer be repaired.

3. The works of repair (*consolidamento*) and renewal considered necessary to assure the integrity of a building should be carried out so as to interfere as little as possible with the general effect of the building.

4. In this respect it should always be borne in mind that the artistic value of a building is frequently to be referred to the modifications occasioned naturally to the

materials, which testify to the past age of the building and accentuate the good and evil of the materials, as well as of the methods of construction, and constitute a proof and a guarantee of their duration and normal stability. The pictorial effect of a building should be taken into account as well as its relation to the atmosphere (*ambiente*) formed around it by time.

5. The restoration of a building may be undertaken under the following conditions:—The re-establishment of portions of a building in their original position, or the removal of additions without particular historical or artistic value, and which do not add to the stability or good preservation of the original portions.

6. Before commencing a work of restoration it is necessary to collect the written or figured particulars relating to the building, having regard to the assistance which may be afforded by a study of works of a similar character and age to that which it is proposed to restore; to study the materials and constructive and decorative methods employed in the building, and to reconstitute, by means of historical records and inquiries, the injuries inflicted on the building.

7. The graphic portion of the preliminary study founded on the results of the foregoing researches should consist of making careful drawings of the structure and condition of the various portions of the building; of taking the necessary tests and plumbings; preserving a record of all the indications of constructive or decorative work, referring to photographs or engravings of such parts as are proposed to be altered; and preparing geometrical drawings of the works considered necessary and the results to be arrived at, reserving power to make any alterations which may be found requisite in the course of carrying out the works.

8. When, for reasons of stability or the attainment of a special æsthetic result, it is desired to have recourse to the completion of any part of a building, care should be taken that when the work is finished the essence, reason and scope of the renovation should be apparent. With this object, while employing materials similar to or allied to the original materials, a simplified workmanship should be adopted in harmony with the general effect, so that there may be no uncertainty as to the extent of the work of renovation.

9. It is permissible to demolish or remove any addition to a building in order to open out any important part of the structure or original decoration, provided the general effect of the building is enhanced thereby, and that such demolition does not result in the further exposure of the mutilations and disfigurement to which the building has been subjected. Before commencing any work of a similar nature it should be ascertained as accurately as possible what are the essential characteristics, and the state of preservation of the original portions of the building, in order to avoid uncertainty, surprises, difficulties and unforeseen expenditure during the progress of the works. When the portions removed have any artistic or historical importance they should be preserved in a place apart, or the fragments of the greatest interest collected, and drawn or photographed as a whole.

10. In every restoration which extends to the subterranean part of a building of a monumental character there will occur:—1. The opportunity of tracing the remains of any edifices anterior to the building to be restored, or the remains of other original arrangements of the same building. 2. The necessity of taking account of the most minute peculiarities of the fragmentary material obtained by means of excavation, especially with regard to its position or accidental deposit, from which it is often possible to deduce an indication of the original plan of the building.

11. This special attention to the material obtained by excavation should extend to material resulting from pulling down, among which may be found portions which may be made use of in the work of restoration, or may be usefully preserved on account of the indications presented with regard to the original arrangement of the building. These decayed artistic or scientific materials, together with any fragments which may be found in the vicinity of the building, which can be identified as undoubtedly belonging to it, should be carefully collected in view of the possibility of their being re-used, or from their interest in connection with the building.

12. Whenever it is found necessary to remove the

colouring or limewhiting which conceals any monumental portions of a building, it is before all things necessary to ascertain if there are any traces of decoration underneath which are interesting from an historical or artistic point of view, and if such be found, to proceed with caution, so as not to injure the structure of the edifice nor the original surface, avoiding the use of metal tools, and using solvent or corrosive agents only when it has been ascertained that the ancient material, having regard at the same time to the damaged condition in which it may be found, will not suffer injury. Any work for the completion of wall-decoration with paintings considered of historical or artistic importance shall be carried out by a special expert under the particular instructions of the Minister.

13. When it is proposed to strengthen a building by iron ties care should be taken that the architectural lines and the picturesque effect of the building are not injured, and in no case should the original building be altered with a view to concealing, in whole or in part, such subsidiary portions of the building. Care should be taken to obviate, by the exercise of timely caution, the injury which may be occasioned by the oxidisation and consequent swelling of iron ties, and in all cases where the original building is of costly material or delicate workmanship the use of copper should be preferred for the purpose.

14. The patching of decorative or ornamental features made with the single object of concealing marks of natural decay in the material employed in a building should be avoided, inasmuch as such operation involves the destruction of some original portions, and the chisel-work necessary to prepare the cavity for the patch may in many instances jeopardise or decrease the harmony (*consistenza*) of the adjacent parts. It is also to be remarked how rarely the operation of patching (*tassellatura*) sensibly improves the æsthetic effect. Alterations occasioned by atmospheric influence or accidental damage when not affecting the stability of a building should be respected. Where the damage is so extensive as to threaten the stability of other portions of a building, partial rebuilding should be adopted with the precautions recommended in the preceding articles.

15. When it is found necessary to repair the roof-covering of a building every trace of the original mode of covering should be preserved and displayed, and the original system followed as far as possible. Where the original form of roof-covering cannot be restored, a system should be adopted differing as little as possible from the original, and in no case altering the effect of the whole in the least degree.

16. Special care should be taken with respect to the regular and safe removal of water by means of arrangements which are consistent with the original condition of any building, preserving always any traces of previous arrangements for that purpose, even when they may have become unserviceable, or are not adapted for reuse.

17. When a building which has been injured by frost or rain is to be repaired, and it is found necessary to use a special roof-covering, whether temporary or permanent, care should be taken, in carrying out the work, that the general effect of the building may not be sacrificed thereby.

18. All works relating to stained-glass of an historical or artistic interest should be executed under the personal direction of an expert acting under rules laid down by the Minister.

19. Works for the restoration of pavements of particular importance, whether as regards the value of the material or the fineness of the workmanship, should be undertaken with no other object than the better preservation of the material and its original arrangement. Recourse should be had to the renovation of original portions only when cavities are disclosed which may become dangerous, or which may promote or accelerate the destruction of adjacent parts. The portions relaid should be constructed of materials differing from the original, in order that the extent of the ancient pavement may be made evident.

20. Decorations of an historical or artistic interest, such as inscriptions, ledger stones, &c., should not be removed unless with the object of preserving them from possible injury.

21. Shoring should be executed of materials sufficiently strong for the time necessary for the execution of the works of restoration. It is recommended from considerations of

economy that brickwork or other permanent materials should be used whenever it is probable that the work will last so long a time as not to justify the use of timber.

22. Provision should be made to free buildings from any vegetation which may constitute a direct cause of deterioration; this operation should, however, only be resorted to when its efficacy compensates for the risk of injury which may be occasioned to the building by its frequent repetition.

23. Care should be taken to prevent the improper use of placards which conceal the important portions of a building, or which injure the artistic or picturesque appearance of the same, and similar placards already in existence should be removed when opportunity offers.

THE SOCIETY OF ARCHITECTS.

THE annual general meeting of the Society will be held at St. James's Hall on Tuesday, October 30, at 8 P.M., when the election of officers and Council for the year 1894-95 will take place.

The following report of the Council on the membership examination question will also be submitted to the meeting:—

"The subject of the desirability or otherwise of an examination of candidates for membership was referred to the Council at the annual general meeting held in October 1893, and since then it has been under careful consideration. A committee was appointed and drew up a series of questions, which were approved by the Council and submitted to the members of the Society. The replies received have been considered, and the opinion of the members appearing to be practically unanimous, the Council have decided as follows:—

"1. That after October 31, 1896, election to membership will only be open to candidates who have passed the Society's examination, with the following exceptions:—(a) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits, as principals, for at least seven years. (b) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits as assistants for at least ten years.

"Candidates applying for membership under *a* and *b* will be required, as heretofore, to submit drawings and other proofs of their professional abilities.

"2. That the scheme of examination shall be formulated and published before June 30, 1895.

"3. That a register of students between the ages of seventeen and twenty-three years be open on November 1, 1894.

"Registered students shall be pupils or assistants in architects' offices and be nominated by a member of the Society, subject to the approval of the Council.

"4. Registered students shall be entitled to the following privileges:—

"Free admission to lectures to be delivered under the direction of the Council in London and the provinces; a ticket giving admission to the Society's ordinary meetings and the use of the Society's library for reference, and a copy of each issue of the 'Journal.'

"5. That each registered student shall be required to pay 5s. per annum, on November 1 in each year, and shall cease to be a registered student on October 31 next after his attaining the age of twenty-three years."

Mr. Edgar Farman (member) gives notice that he will move the following amendments:—

To Clause 1.—"That the following article be added as Article 11A to the articles of association, to become operative on October 31, 1896:—'Subject to confirmation by general meeting, the Council shall select from time to time certain examinations, which shall be deemed qualifying examinations for membership of the Society; and election to membership shall be only open to candidates, approved by the Council, who have passed any one of such examinations, with the following exceptions:—

"(a) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits, as principals, for at least seven years. (b) Candidates who are not less than thirty-five years of age, and have been directly engaged professionally in architectural pursuits, as assistants, or as assistants and principals, for at least ten years.'

To Clause 2.—"That the first list of qualifying examinations selected by the Council be submitted to a general meeting, to be called not later than March 31, 1895."

To Clauses 3, 4 and 5.—"That the consideration of these clauses be postponed."

SHEFFIELD SOCIETY OF ARCHITECTS.

THE annual conversazione of the Sheffield Society of Architects and Surveyors was held on the 12th inst. There were between 300 and 400 guests. Mr. Gibbs, the president, said it was very gratifying to them that the invitations had been so generally accepted. Referring to the exhibition of sketches and measured drawings of ancient buildings in the district, executed during the summer months by the younger associates and students of the Society, Mr. Gibbs explained that the work of the Society was largely educational. They carried on their work in the form of lectures and discussions on special subjects, the formation of a library for the benefit of all the members, and classes on the study of the history and styles of architecture, sketching, designing, and surveying and levelling for the benefit of the younger members. The exhibits of the sketching class shown that evening was only a small part of the educational work of the Society. He hoped the work of the other classes would be as fully exhibited next year. The Society was also active in matters relating to professional practice, and desired, whilst protecting the interests of the profession, to command the respect of the general public by maintaining the honour of its members and the standard of their ability to solve successfully the complex problems of modern building and surveying, by combining the most perfect arrangements of plan, the best construction, and the most artistic conception and finish with the soundest advice as to values and cost and the practical superintendence of the work. The President then drew the attention of members to the programme for the ensuing session and of the students to the particulars of classes and prizes. At the request of the Council of the Royal Institute he called special attention to the new examination in architecture and to the new form of application for architects and chief assistants. He then proceeded to the distribution of the prizes to the members of the sketching class. The first prize was awarded to Mr. Frank W. Chapman for sketches and measured drawings of parts of the churches of Ecclesfield, Whitwell, Beauchief Abbey, South Anston and Laughton-en-le-Morthen, and other places in the neighbourhood; and the second prize to Mr. J. C. Amory Teather for drawings of the same buildings.

Afterwards the guests inspected the collection of pictures of the Sheffield Society of Artists, which were on view.

TESSERÆ.

Invention in Art.

WHEN used in the language of art, invention has a different signification from what it usually bears in common language. It does not mean discovery, but combines conception, or the peculiar way in which an artist's mind takes cognisance of a subject to be represented, with the mode of treatment, or choice of objects and manner of disposing them best adapted for producing a desired effect. Thus, in painting and sculpture, it is the faculty by which the most perfect mode of illustration, by colour or by form, is suggested to the artist, and by which the mind of the spectator is led to comprehend the truth, the intention and the whole purpose of the work before him; but so distinct is it at the same time from perfect execution, that it is often found to exist independently of excellence in that particular, some of the finest inventions in art being manifestly defective in technical requirements. It is therefore the highest quality in the constitution of the artist's mind; as Opie says, "Destitute of invention, a poet is but a plagiarist, and a painter a copier of others." It is hardly necessary to enter into the question whether the power of invention be a primary and original law of the mind, or whether the effect of cultivation. Some have believed it may be a result of acquirements begun in youth and carried on till the power is developed and perfected; others conceive that it is unattainable by any human effort, and is part of the original constitution of the mind. But even admitting invention to be a gift of nature and not reducible to rule, nor to be taught by any regular process, it still may be improved by study. Whatever natural disposition or original capacity may exist—and it will not, we suppose, be denied that some minds are more bountifully endowed than others—every power short of creation must have groundwork and foundation on which and out of which to exercise itself; and even the inventive faculty, which seems to approach nearest to creation, depends upon knowledge, by whatever means acquired, for materials with which to develop and declare itself. Sir Joshua Reynolds says, "He who has the most materials has the greatest means of invention, and if he has not the power of using them it must be from a feebleness of intellect;" and "it is in vain to endeavour to invent without materials on which the mind may work," &c.

Decorative Art.

All the greatest art in the world is fitted for a place and subordinated to a purpose. There is no existing highest-order art but is decorative. The best sculpture yet produced has been the decoration of a temple front; the best painting the decoration of a room. Raphael's best doing is merely the wall-colouring of a suite of apartments in the Vatican, and his cartoons were made for tapestries. Correggio's best doing is the decoration of two small church cupolas at Parma; Michel Angelo's, of a ceiling in the Pope's private chapel; Tintoret's, of a ceiling and side wall belonging to a charitable society at Venice; while Titian and Veronese threw out their noblest thoughts not even on the inside, but on the outside, of the common brick-and-plaster walls of Venice.

Apelles, the Painter.

The character of Apelles shows itself in a noble light in his conduct towards Protogenes, who was not duly appreciated by the Rhodians. Apelles, finding many of his pictures on his hands, offered to purchase them of him at his own price, but Protogenes named so low a sum that Apelles fixed fifty talents for the purchase of the whole, and allowed it to be reported at Rhodes that he intended to sell them as his own. This conduct opened the eyes of the Rhodians to the merits of their painter, and they secured the pictures for themselves at the price fixed by Apelles—upwards of 10,000*l.* Apelles was famed for his industry; he never spent a day without exercising his pencil in some way or other ("Nulla dies sine linea"). The old proverb also of "Let the cobbler keep to his last" originated, it is said, with him. It was a custom with the Greek painters to expose their pictures when finished to the public view in the front or in the porches of their houses; and a cobbler found fault with the sandal of one of the figures of Apelles thus exposed, but perceiving it corrected on the following day was bold enough to venture his criticism upon the leg also, when Apelles came out and indignantly told him that the cobbler should keep to his last, which from that time became a proverb ("Ne sutor supra crepidam"). The majority of the works of Apelles seem to have been portraits, or of a portrait character, his subjects seldom containing more than one or two figures. Two pictures only by him are mentioned by ancient writers as compositions of many figures—Diana surrounded by her Nymphs, in which he was allowed to have surpassed the lines of Homer, from which he took the subject; and the pomp or procession of the high priest of Diana at Ephesus. His horses, which he appears to have often introduced into his portraits, were very celebrated. Ancient writers tell various anecdotes attesting their excellence. Many anecdotes also are related attesting his familiarity with Alexander the Great. He used to glaze or tone his pictures with a dark transparent varnish, after they were finished. Lucian reckons him among the four greatest colourists. He survived Alexander many years, but neither the date nor the circumstances of his death are known. He left writings on the arts.

Rubens as a Painter.

The source of pleasure from works of art is obscure, and the nature of the pleasure itself is little capable of definition, but men think to obtain greater precision, and to arrive at the reason why they are pleased, by this process of comparison. To a certain extent perhaps we may succeed, but in general such comparisons have a tendency to narrow our field of enjoyment, and to lead us to dogmatise on what cannot be reduced to fixed rules. A man may derive greater satisfaction from the works of Perugino or Francesco Francia than from those of Rubens or Teniers; he may feel the beauty of the Parthenon more than that of Strasburg Cathedral, but he is not therefore justified in saying that Rubens was a bad painter, or that Erwin of Steinbach was an indifferent architect. The principal sources of pleasure in painting appear to be form, composition, colour and, the highest of all, the expression of human character and action. The subdivisions of this last branch are of course infinite, and comprise the higher and holier feelings, as well as those which are more properly a portion of our animal nature. In those parts of his art which act immediately on the senses Rubens was without doubt a great master. He understood the perfect management of light and shade, of composition and of colour. If his merits are disputed, it is with reference to the subjects which he painted and to his mode of treating them, not to his technical skill. Before his visit to Italy he had acquired an individual character as an artist. The fruit of his labours there was not a crude mass of detached imitations, but whilst he carefully studied the great masters at Venice and elsewhere, his vigorous genius assimilated and appropriated to itself all that it took up or borrowed. The excess of individual peculiarity in Rubens certainly amounts to manner in the narrower sense of the word. That peculiarity of feeling, too, did not dwell on the

forms which are best fitted for expressing the tranquil and devotional sentiments which prevail in early Christian art, but still, such as it was, it was eminently characteristic of a great painter. Sculpture exceeds painting in its power of expressing form, and equals it in that of portraying fixed character; but painting only can express the tumult and energy of human action in full power and motion. In this Rubens excelled, and it is surely no mean excellence. We are ready to grant that his *Madonnas* are for the most part clumsy and undignified; that their forms are unfitted for the being whom they represent, and that exaggeration sometimes disfigures scenes where quiet and holy feelings would be more in place. Notwithstanding all this, the stronger human passions and actions have an intense interest for mankind. The animal energy and the sensual characteristics of man are a part of that complex whole which we call human nature, although they are not the most elevated part. If art is to represent man as he is, these elements cannot be wholly overlooked. The Greek drama displayed them too glaringly in the olden comedy, and Greek sculpture embodied them in its fauns and satyrs. An acute sense of beauty indeed generally softened the more disgusting features, and we might wish that Rubens had been oftener touched with similar scruples. We must take him, however, as he is, with all his technical excellence, and with all the incomparable energy and heartiness which animates his best works. In them there is none of that idle filling up of vacant corners, or that insertion of cold academic figures, wholly unconcerned with the scenes portrayed, which we find in works of the same kind by other masters. If we look at Rubens's *Village Fête* in the Louvre, the ring of peasants wheel round in the dance with a drunken merriment which seems in actual motion before us. The smaller picture of *The Last Judgment* at Munich is just as wonderful for this quality of movement as for its glorious colour and execution. His *Battle of the Amazons* in the same collection conveys, in a most wonderful degree, the struggle and energy of a combat. Action and life he never failed to represent as no other painter has done before or since, and this alone entitles him to a place in the very foremost rank of artists.

Bubb Doddington's House.

Bubb Doddington's house, which stood in the parish of Tarent Gunvill, Dorset, was commenced by George Doddington, of Somersetshire, about 1718, but he only finished the offices; the house itself was completed by his nephew, the notorious Bubb Doddington, the son of an apothecary at Weymouth, who raised himself by Court intrigues into a considerable position, and was created Lord Melcombe. The house was completed by him at a cost of 140,000*l*. The main body of the house extended 144 feet, and was 95 feet in depth. Plates of the house and garden are given in Campbell's "*Vitruvius Britannicus*," vol. iii. It is alluded to in Thomson's "*Seasons*," Autumn, i. 651, 669, and other poems. Lord Melcombe died without issue in 1762, bequeathing his property to his cousin, Mr. Wyndham. It then came by family settlement to Richard Grenville, Earl Temple, and descended to his nephew George, second Earl Temple, created in 1784 Marquis of Buckingham, who sold it to Josiah Wedgwood, the famous potter, whose widow resided there. It then passed into other hands, and was ultimately pulled down, the materials selling for about the plumber and glazier's bill of the original dwelling.

John Constable, R.A.

Constable seemed to think that he came into the world to convince mankind that nature is beautiful. Instead of seeking for the materials of poetic landscape in foreign countries amidst temples and classic groves, or in our own amongst castles, lakes and mountains, he taught that the simple cottage, the village green, the church, the meadow covered with cattle, the canal with its barges, its locks and weedy banks, contained all the materials and called up all the associations necessary for painting. He doted upon his native fields. "I love," said he, "every stile and stump and lane in the village: as long as I am able to hold a brush I shall never cease to paint them." So great a lover of simple truth could not tolerate the commonplaces of art or literature. The freshness and novelty of his pictures, he continues, both surprised and delighted the French painters at the time they were exhibited at the Louvre. They seemed more like the works of nature than art. The dew of the morning was found upon the leaves and the grass. Originality in every art will always meet with opposition from those whose ideas are bounded by the commonplaces of the day. It was Constable's glory that he did not escape. The damnable judgment of the critics confirmed him in his own views and gave fresh animation to his exertions. "A great connoisseur," he says, in one of his letters, "called on me the other day and told me he did not like my picture. This convinces me there must be something good in it." But while disgusted with the cant of ordinary criticism, he delighted to hear honest John Bannister, the comedian, say he felt the wind blowing in his face as he looked at his pictures, and Fuseli

declare that they made him call for his umbrella. "I care not," he would say with Sterne, "for the dogmas of the schools; let me get at the feelings and the heart in any way I can." The above extract clearly points out the style of Constable, the peculiarities of his execution and of his character, though the process of reasoning is not very evident which leads him to conclude that there must be something good in a picture because a connoisseur dislikes it, or to lead him to feel delight because looking at his pictures makes one man feel the wind and another fancy it is going to rain.

The Ely Octagon.

One of the most exquisite specimens of Decorated architecture in England is the Octagon of Ely Cathedral, as it is familiarly called. In the early part of the fourteenth century the old centre tower, over the junction of the nave with the choir and transept, fell, and the present octagonal tower was built in its place. This tower owes its beauty mainly to the interior. The exterior is not very striking, because it is too low in respect to its width, and the lantern of wood with which it is surmounted does not well correspond in character with the stone octagon on which it is placed. The octagon is not equilateral, but consists of four broad faces with four narrower faces intervening, the broader ones facing the four cardinal points. The octagon is only of one storey above the roof, and has an arcade of Pointed arches, some of which are pierced through and glazed as windows. Below these arcades are rows of acutely Pointed windows. The interior of this octagon, however, is its striking feature. In the four greater sides of the octagon are four lofty arches, which open respectively into the nave, choir and north and south transepts. The four smaller sides have four smaller arches, opening obliquely into the side aisles, and having small windows above them which are seen externally. These arches are supported by eight gracefully-clustered columns or piers, the capitals of which are composed of beautiful wreaths of foliage. The surface of the wall between the arches and the windows above is occupied by canopied recesses and brackets. The clustered columns, from which the ribs of the vaulting of the octagon spring, rise from the top of a number of richly-canopied niches, supposed once to have contained statues: these niches rest upon brackets, each of which is supported by a small cluster of very slender columns. On the capitals of these small columns are represented in relief the most important events in the history of St. Etheldreda (the Anglo-Saxon foundress of the abbey of Ely), each one of the eight capitals representing a particular event. In the centre of the vaulting of the octagon is an aperture, 30 feet wide, upon which the lantern is set. This octagonal structure has been described as a most singularly-beautiful and skilful work, in which solidity and gracefulness, magnificence and lightness are so happily blended together, that the spectator is at a loss to decide in which of these respects it is most worthy of admiration. The idea was altogether new, and the work remains to this day an undeniable proof of his exquisite skill and taste as an architect. By throwing the weight upon eight strong piers and arches, instead of four, he has given to this part of the cathedral not only greater strength, but a magnificence of space and a gracefulness of form such as is seen in no other cathedral in England of the Pointed style. An immense body of light is let down from the lantern above.

Cennini's Treatise on Painting.

The "*Trattato della Pittura*," by Cennino Cennini, a pupil of Angelo Gaddi, may be termed the oldest modern book on painting. It was first published in Rome in 1821 by the Cav. Giuseppe Tambroni, with a preface, notes and an index. The work is divided into 171 chapters and occupies 157 octavo pages. There are three MSS. of it extant—that in the house of the Beltrami di Colle, which may be the original MS. noticed by Vasari; another in the Laurentiana at Florence, Banco 78, No. 24; and a third in the Vatican Library, MSS. Ottoboniana, No. 2964, dated 1737, and formerly in the possession of Baron Stosch; it is, however, badly transcribed. The first and second mentioned may be the same MS. The original MS. was finished July 31, 1437, in the prison for debtors, and when Cennini was about eighty years of age. Cennini was born about the middle of the fourteenth century, for he was apprenticed to Angelo Gaddi in 1375 at the latest, as he was with Gaddi twelve years, and Gaddi died in 1387. Supposing Cennino to have been born, therefore, about 1360, his book may be considered as belonging to the fourteenth century, and to give us the practice of that period. Cennino treats in this work of the rudiments of design; colouring; materials and their use; on the preparation of colours, their nature and origin, and on tools; on fresco-painting; on distemper on walls and on perspective; on oil-painting, with oil thickened in the sun; on gilding; on distemper (*guazzo*) for panels and canvases, and on the method of preparing grounds; on gilding, varnishing and illuminating parchments, and on taking casts from the life, &c. There is an English translation by Mrs. Merrifield.

NOTES AND COMMENTS.

OVERSEERS and assessment committees have a hard task whenever they are compelled to place a value on charitable institutions. If they apply the common scale they are considered to be more merciless than SHYLOCK, while, if they make allowances, they are held to be unjust to the rate-payers of their district. The most equitable way, on the whole, is to ask what rent would a tenant have to pay for the premises under ordinary circumstances? Mr. VIGERS, in his evidence before the betterment committee, said he determined the rateable value of St. Thomas's Hospital by considering, in the first place, what the land was worth as a hospital site, and, secondly, what would be the value of a plain building, "not a building built in the expensive way it is built," in such a position. The outlay was very large on the hospital, but Mr. VIGERS considered about 6*l.* a foot was an adequate rate. On Tuesday last, at the Quarter Sessions at Lewes, the question had to be determined in respect of the Surrey Convalescent Home at Seaford. The building was erected three years ago at a cost of 10,000*l.* by a benevolent person. In January 1892 the gross value was put down at 590*l.*, which was 5 per cent. on the outlay and 90*l.* for the land, the net value being 470*l.* The Trustees appealed to the rating authorities, and the value was diminished to 360*l.* gross and 290*l.* net. This year a demand was made for poor rate on the assumption that the home was worth 420*l.* gross and 350*l.* net. The Trustees appealed. It was admitted that the buildings were costly, for although there were only fifty beds, the outlay was more than in another home where 180 patients were accommodated. Mr. DENMAN, architect, one of the witnesses for the assessment committee, said that he should have no difficulty in finding a tenant for the home as a school at 500*l.* a year, but as a matter of concession he would advise that the method of assessment should be based on an estimate of 4 per cent. on the building and 3 per cent. on the land. As the land is valued at 2,800*l.*, that scale would bring out the gross valuation at 484*l.* The magistrates, after careful consideration, found the gross value of the home was 400*l.* and the net value 320*l.* From the conclusion it would appear that 2½ per cent. on total value of land and buildings gives a sufficient net value for taxation.

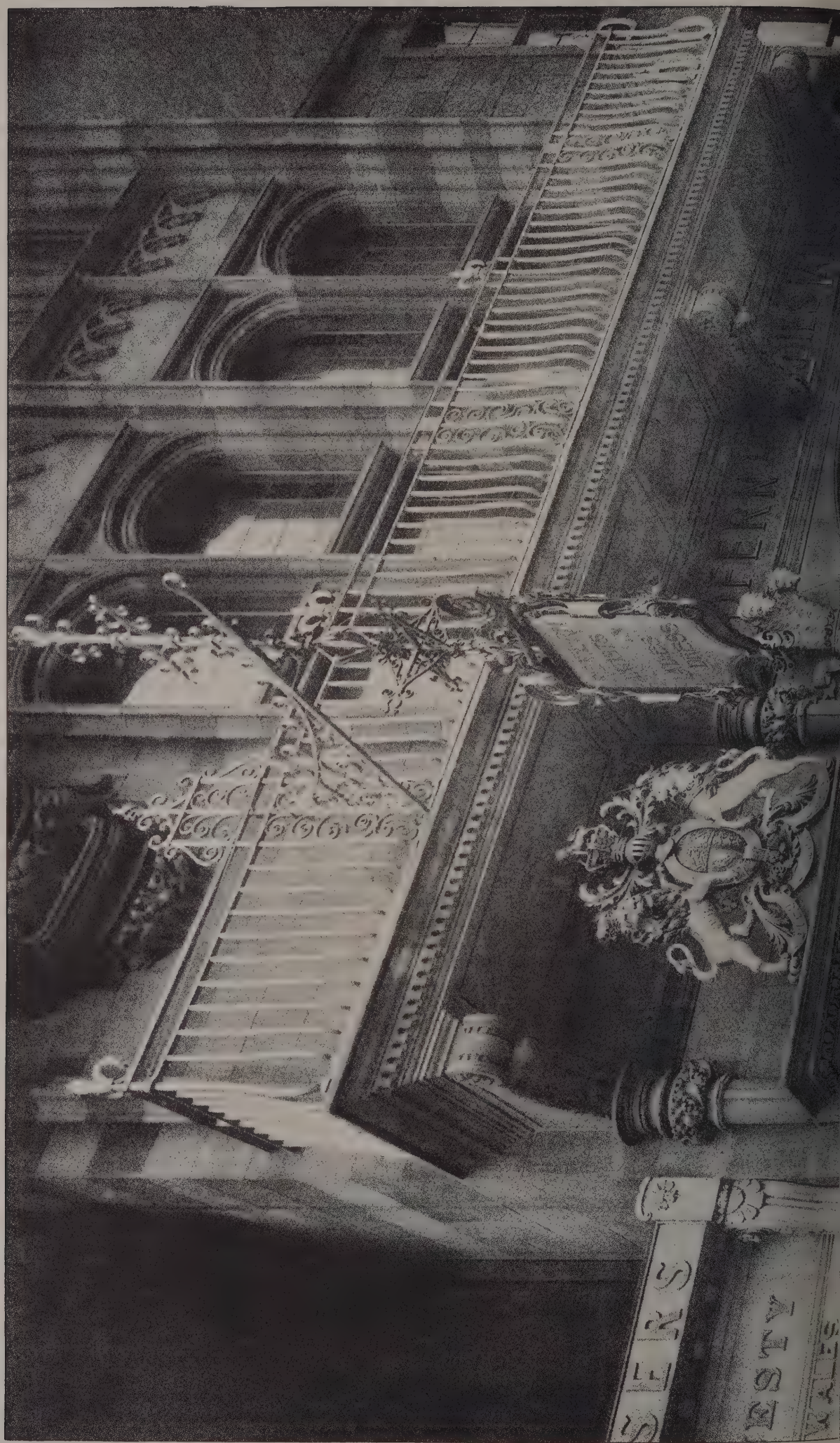
THE approach of the winter as usual has hastened the production of technical books for the use of students. A small but excellent volume on "Specifications," by Mr. JOHN LEANING (SAMPSON LOW, MARSTON & Co.), is, however, adapted for others also, as it can be often utilised by the young practitioner. It is arranged in an orderly manner corresponding with the most convenient arrangement of a specification. More contrast in the type would have made reference easier for all who are in a hurry and are anxious about including everything in a specification. Mr. C. F. MITCHELL, of the Polytechnic Technical School, has increased the quantity of books prepared for the coaching of students who are about to undergo the ordeal of examination of the Science and Art Department and other bodies by his "Building Construction" (B. T. BATSFORD). Books of the kind do not allow of much variety of treatment and the competition becomes one between prices; it must be allowed that in this case a substantial volume is given for 5*s.* 6*d.* "Thermo-Dynamics," by Mr. J. PARKER, M.A. (SAMPSON LOW & Co.) is hardly a book that is adapted for those who are mainly occupied with statical problems—although the boundaries between the two great divisions of mechanics become less definite as time runs on—but the author is a thinker, and his pages have importance for students of those laws of life of which NEWTON may have had a glimpse when he compared himself to a child walking on the shore with an ocean beyond him. Since agricultural labourers, like so many philanthropists, have arrived at the belief that *repoussé* is the beginning and end of modern technical education, and a remedy for general distress, it is surprising there are not more books on the subject than on building. In Mr. J. HARRISON'S "Decoration of Metals" (CHAPMAN & HALL) we have a workman addressing workmen, and he imparts really useful information for those who propose to live by means of metal-working, as well as for all who take up

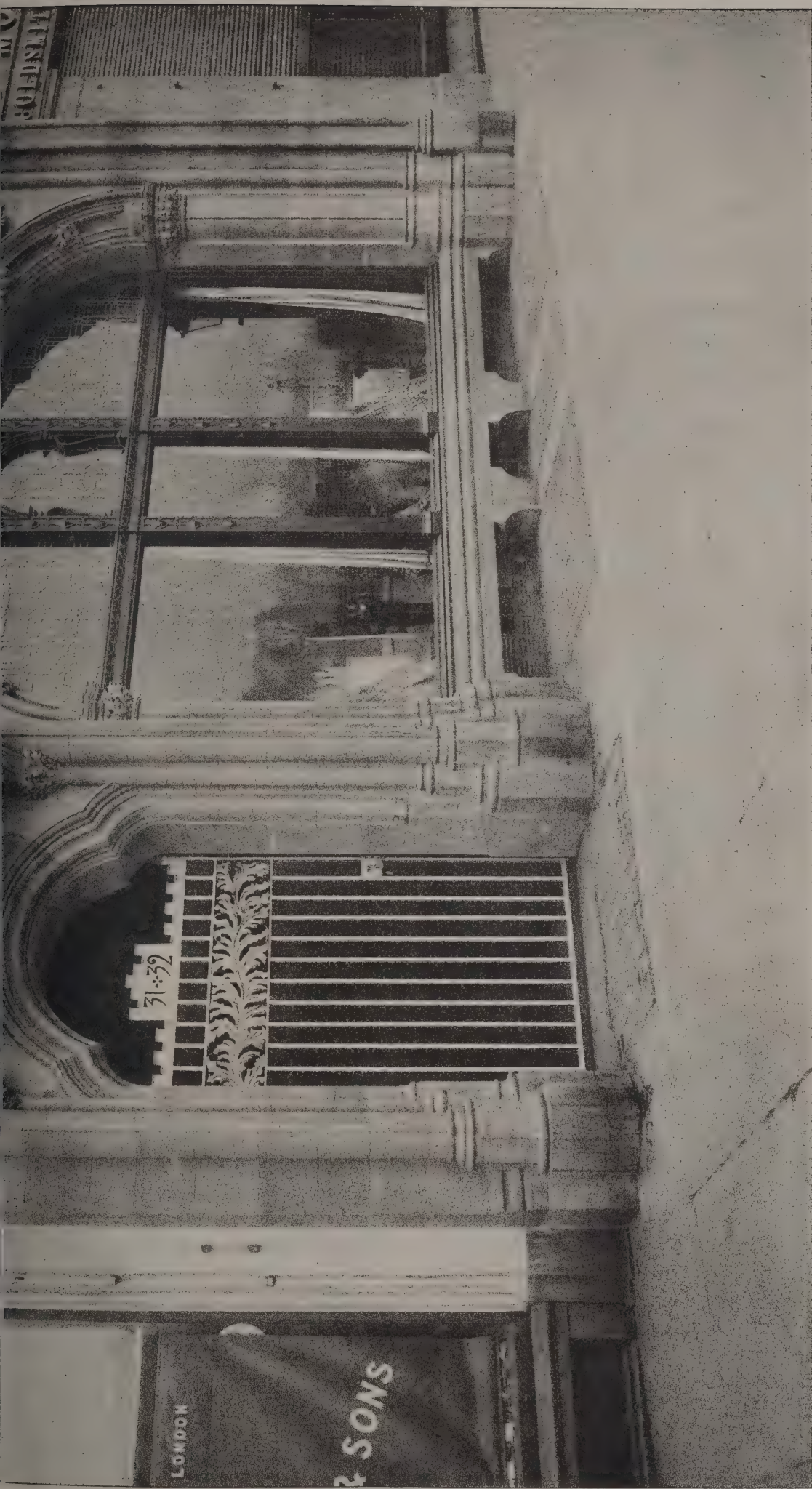
this fascinating art as an accomplishment. It is a pity there are not many more modest but serviceable books, which can be placed on the same shelf. There are some illustrations in the pages from works by VECHTE and MOREL LADEUIL, artists to whom Birmingham is indebted, and also some from ancient examples. But in the majority we see the baneful influence of South Kensington, and with such "decoration" as is represented it is no wonder "Brummagem" goods are only appreciated in districts where there are departmental art schools. How a man who writes so sensibly is not ashamed of the ornamental things he employs as patterns is one of the educational mysteries which are not to be explained. "American Plumbing," by Mr. A. REVILL (International News Company), hardly bears out the title, for a large part relates to English appliances, while others which are much used in the States are not noticed. In a country where "plumbing regulations" are enforced in so many cities there ought to be more of the national inventiveness applied to the trade than is suggested in the volume.

IN the North of Ireland runs a range known as the Slieve Beagh Mountains, forming a boundary between Monaghan and Tyrone. There is a very ancient tradition about the name. In the "Annals of the Four Masters" it is recorded as follows:—"Forty days before the Deluge CEASAIR came to Ireland with fifty girls and three men, BITH, LADHRA and FINTAIN their names. BITH died at Sliabh Beatha, and was interred in the cairn, and from him the mountain is named." There is a tumulus which is known as "Carn-More," and it is locally considered to be the grave of the ancient immigrant. It is formed of loose stones and stands on a rock which is utilised as a quarry. In the course of the excavations the tumulus has been undermined and a large part of the circle has fallen down, revealing the heathy and peat moss covering of the mountain. After surviving for a period which no chronologist would now venture to estimate, it is unfortunate that the prehistoric monument should be doomed to ruin. One of the members of the Irish Society of Antiquaries, in reporting the circumstance, writes:—"Whether the broken section of this cairn can be replaced or repaired I know not; but one thing seems clear, that it is the bounden duty of the Society to check as speedily as possible this act of vandalism, and thus to arrest the destruction of a monument which dates from the earliest colonisation of our country, and which far and wide forms a familiar landmark." As the quarry is not worth more than three or four pounds a year there ought to be little difficulty in preserving the most ancient of all the Irish monuments.

THE restoration, or rather the completion, of Cologne Cathedral was for many years a subject of interest not only in Germany but wherever Mediæval architecture was admired. Strangers used to wonder that funds were not immediately provided and the works carried out with expedition. It may not be known that the conservation of the cathedral was costly and that for ten years the King of PRUSSIA subscribed about 2,000*l.* a year in order to keep the choir alone in repair. Between 1824 and 1881 when the restoration was completed, the outlay on the building, according to Herr BEIMANN, was 19,624,000 marks, or nearly a million sterling, a sum which appears larger in Germany than in England. While the French were omnipotent the building was fast becoming a ruin. In 1816, when the Empire had collapsed and there was a hope of peace, the project of completing the building found favour. SCHINKEL, the architect, had received a commission from the King of PRUSSIA to design a cathedral that would be a memorial of the satisfaction of the dawning of a new era in Europe, but public opinion was in favour of making the ancient building in Cologne serve that purpose, and SCHINKEL himself was probably of the same opinion. AHLERT and afterwards ZWIRNER were charged with the restoration. In 1842 the people were dissatisfied with the slow progress, and a society was accordingly formed with the object of obtaining funds to have the works carried out energetically. In the next year the foundation-stone of the extension was laid by FREDERICK WILLIAM IV. The works then undertaken occupied exactly forty years to complete.

The Architect, Oct. 19th 1894.





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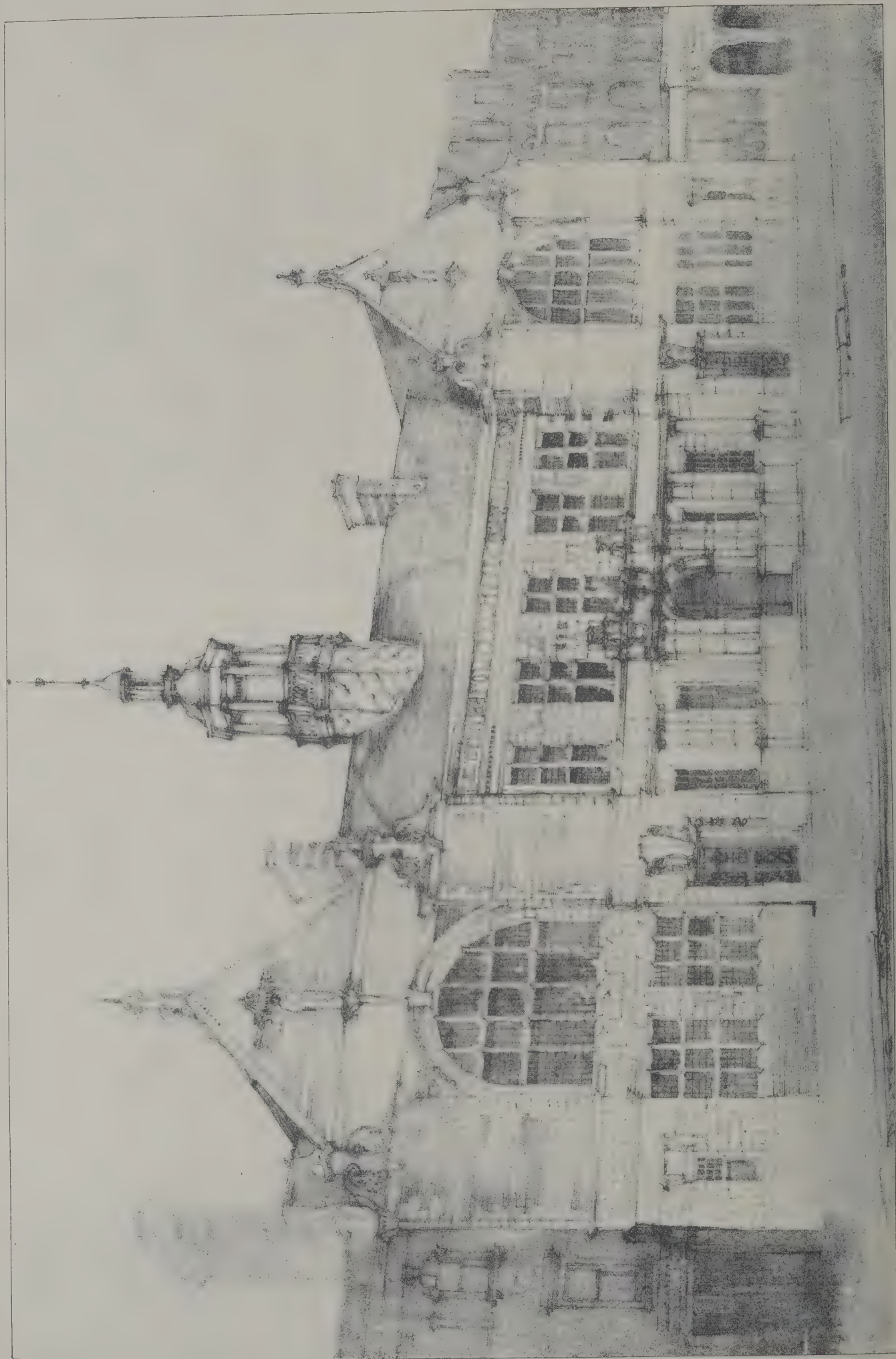
A SHOP FRONT, PRINCE'S STREET, EDINBURGH.
G. WASHINGTON BROWNE, Architect.



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THE "PORTLAND ARMS" TAVERN, HIGH STREET, ST. JOHN'S WOOD, N.W.
R. A. LEWCOCK, Architect.



ILLUSTRATIONS.

A SHOP FRONT, PRINCE'S STREET, EDINBURGH.

DESIGN FOR THE NORTHERN POLYTECHNIC INSTITUTE.

THIS was one of the six designs submitted in the recent limited competition for this Polytechnic, to be erected in Holloway Road, N. An attempt has been made to contrive a workable plan by a simple arrangement of corridors for men and women respectively, with top and side lights, and a cross corridor at the back leading to the workshops and having a separate approach from Brand Street.

The large entertainment hall is centrally placed near the public entrance, and provides accommodation for 1,250 persons. The social club-rooms are also placed near the entrances, the reading-room, library and museum being on the first floor, approached by stone staircases from the main vestibule.

The social or club side of the Polytechnic has thus been kept to the front and the educational to the back of the building. The workshops and class-rooms are contained on first floor, with science lecture-rooms and a complete suite of music-rooms. An art school is provided on second floor, with range of north lights.

Considerable difficulty was felt in providing the extensive accommodation set forth in the requirements issued to competitors for the sum of 25,000*l.*, but the frontage to Holloway Road only being 130 feet, and the rest of the building practically hidden from public view, the cost per cube foot was calculated at a low rate.

The front to Holloway Road was intended to be of red brick and Monk's Park Bath stone, and the total estimated cost including heating, 27,600*l.* Mr. T. PHILLIPS FIGGIS was the architect.

NEW POLICE BARRACK, CHAPELIZOD, CO. DUBLIN.

THE drawing of the new Police Barrack, Chapelizod, Co. Dublin, which we publish was designed and etched by Mr. HOWARD PENTLAND, B.A., Bac. Eng., A.R.H.A., F.R.I.B.A., senior surveyor to the Board of Public Works, Ireland, and was hung at this year's exhibition of the Royal Hibernian Academy of Arts. The site adjoins the Phoenix Park, between portion of which and a bend of the river Liffey lies the little village of Chapelizod. It is intended to have communication with the Phoenix Park as well as with the road through Chapelizod, both for the proper supervision of the park and to enable the constables who are off duty to avail themselves of the pleasures of its 1,700 acres. The contract, exclusive of the sewage disposal, the boundaries and approaches and the formation of the parade ground, has been let to Mr. JOHN PEMBERTON for 3,150*l.* The ground-floor walls and the chimneys will be finished with first quality red bricks from Portmarnock, near Dublin, where Mr. PLUNKET has succeeded in turning out a good supply of fine vermilion bricks. The upper portion of the walls will be plastered and the roof covered with red Ruabon tiles. It is proposed to deal with the sewage in three Dortmund tanks, with the patent "Oxygen" process of Messrs. ADENEY & PARRY. We understand that Mr. MELLISS, M.Inst.C.E., the well-known authority on sewage disposal, visited the works for this process erected some time ago from Mr. PENTLAND'S designs at the Central Criminal Lunatic Asylum, Dundrum, and that he has written a most favourable report on them.

THE PORTLAND ARMS TAVERN, 60 HIGH STREET, ST. JOHN'S WOOD.

THIS building, which is the first property rebuilt under the new leases, has been erected in High Street, St. John's Wood. It is a landmark and an example of the elaborate construction adopted at the present date for licensed property. The upper fronts are of Portland stone with red brick facings. The lower fronts and internal fittings are of polished walnut and oak, largely relieved with brilliant cut and bevelled plate-glass. The work has been carried out by Mr. J. E. WALL, builder, 192 Hackney Road, from the designs and under the supervision of the architect, Mr. R. A. LEWCOCK, 88 Bishopsgate Street Within, E.C.

THE ARCHITECTURAL ASSOCIATION.

THE conversazione of the Association was held on Friday evening at the Queen's Hall, Langham Place, W., when a large attendance of members and friends assembled. Mr. E. W. Mountford, who now enters on his second year as president of the Association, welcomed the visitors as they arrived. The vice-presidents, Messrs. Hooper and Pite, the hon. secretaries, Mr. F. Goldsmith and Mr. B. Fletcher, the hon. treasurer, Mr. H. W. Pratt, and many other prominent members of the Association were present. The musical programme for the evening was successfully carried out by the Rebec Orchestral Society and the Pierrot Banjo Team, Mr. W. Horsey acting as hon. conductor of the former, and Mr. Clifford Essex for the latter. Mr. Leonard Butler presided at the organ and Miss Ethel Bonavia at the pianoforte. The prize drawings of the students were displayed, as well as a collection of photographs by the Camera Club and photographs by the late J. L. Robinson, as taken by him during the last annual excursion to Wells.

Among the exhibits were specimens of church furniture and ecclesiastical robes, art metal-work, including brasswork, altar crosses, chalices, &c. Messrs. Watson & Co. showed photographs of rich copes, as designed by Mr. G. F. Bodley for All Saints Church, Margaret Street, W., and Lichfield Cathedral. Messrs. Jeffrey & Co., Essex Road, showed samples of their handsome wall-papers, but, contrary to their usual custom, the designers' names were not apparent. Messrs. S. J. Waring & Sons, of London and Liverpool, showed fine samples of textile materials, also parquet flooring, mantelpieces, &c.; the Graislaid Block Printing Company, pleasing designs executed in silks, velvets and chintzes, also carpets; Messrs. Turberville, Smith & Son, carpets; Haywood & Co., wall-papers, some as designed by Mr. John Belcher, Mr. Beresford Pite and Mr. C. Heaton; Messrs. Collinson & Lock, cabinets, silk hangings, &c. Among the exhibits, as a rule, there have usually been a goodly show of water-colour drawings by members, and it would have been a disappointment not to have seen some works by Mr. Phené Spiers. With the exception of Mr. Phené Spiers, the other members were conspicuous by their absence as regards showing any water-colour drawings.

LANCASHIRE AND CHESHIRE ANTIQUARIAN SOCIETY.

THE first meeting of the new session of the Lancashire and Cheshire Antiquarian Society was held at Cheltenham College, Manchester, on the 12th inst. Professor Boyd Dawkins presided. The President congratulated the members on the position of the Society. It was firmly established among the archaeological societies of the country, and was doing local work of the very highest importance not only with regard to the period covered by history, but also the period beyond history in the remote past. Much of the success the Society had achieved was without doubt due to the indefatigable secretary, Mr. Yates. He had not been able to prepare a set address, and he was obliged to fall back upon one or two points of archaeological interest which had come before him during the last three or four months. He had been working at the apparently unpromising subject of human skulls. A number of skulls had been discovered in the excavation of the Preston docks, underneath the alluvium and in association with the old forest which existed at that place. These skulls he found upon examination to belong to a people of very fair intellectual development. All of them were ovate skulls, tending in one or two instances towards the long-headed type. Of their place in European ethnology there could be no doubt. They were absolutely identical with skulls found all the way through these islands and into France and Spain. Along with the skulls were found others of a different and newer type—round skulls with high cheek bones. These belonged to a people who made their appearance in this country in the Bronze Age, and along with the skulls were found bronze implements. Both types—the Iberic and the Celtic—were represented in the present population of the country. He had been remeasuring the collection of skulls made in Derbyshire by the two Batemans during the first half of the century, and had been astonished to find the enormous preponderance of the Celtic type. The Celtic people were certainly the dominant inhabitants of Derbyshire in the Bronze Age. The same remark applied to Yorkshire, and these round skulls were also found scattered about in large numbers in the South of England. Some interesting discoveries had recently been made near the town of Glastonbury, in Somersetshire, by a committee of which he was a member. In the digging up of the old village some curious facts had come to light with regard to the people of pre-Roman times.

Mr. Yates read a paper prepared by the Rev. J. R. Luck, S.J., on the opening of the large tumulus near Stonyhurst; the Rev. E. F. Letts read a paper by Monsignor Gradwell on the church at Overton, which he maintained was the oldest church in Lancashire, tracing it back to the sixth or seventh century.

DISCOVERIES IN ARCHITECTURE.*

By Professor T. ROGER SMITH.

CAN there be such things as discoveries in architecture here, and now at the end of the nineteenth century? I fancy that I hear some persons under whose notice the announcement of the subject of this lecture may have come put this question, with a quiet idea that it ought to be answered in the negative. It is my intention, however, to show, in addition to some notice of past discoveries, that there are and will be discoveries in architecture at the present day; and, what is more, that some of these discoveries should await yourselves if you are to succeed as students. Let us first, in order to clear the way, make sure as to what a discovery really is, and what it is not. Discoveries and inventions have been so mixed up in people's minds and are so often intimately associated in actual fact, that perhaps the first thing to point out is that a discovery is not an invention. You discover something that exists; you invent something which has not existed before. Discovery is the proper reward of research; you dig in order to uncover what is hidden. Research is the digging process; discovery happens when you dig successfully. Experiment is the usual method by which invention is forwarded. You think of the best means of compassing a result and then you make a trial. In architecture the way of making that trial is by making a drawing, and one of our main difficulties is that from the best drawing to a finished building is such a long step. Very many inventions, especially scientific ones, have not only been based upon discoveries, but have followed close upon them or have gone, so to speak, hand in hand with them, so that the distinction between discovery and invention has in such cases become obscured; but it is a very real one. Let us illustrate it by an example or two. One of the greatest discoveries of modern times was the discovery of America. One of the greatest inventions was that of printing. At any rate, these two great feats serve to illustrate extremely well the leading distinction between invention and discovery. America was there (and had been there for ages) when Columbus first reached its shores. He in no sense created or invented America, but he did discover that country. On the other hand, printing did not exist before the days of Gutenberg, if he was the inventor of printing. Writing existed, it is true, and the first printing was an imitation of writing; but the power of reproducing a number of copies of the same document by using movable types had never been obtained before. Printing did not exist—it was invented, and thenceforward it remained one of the arts of civilisation for all time. The word "discovery" signifies an uncovering of something covered up—a bringing to light something that is hid. It is (let me add) a personal thing, and though it is often enough followed by the making public of the discovery, that is (please to note) quite a separate matter and may be postponed or omitted. Columbus discovered America on the day the hazy outlines of a distant coast began to rise over the dim margin of the ocean, not on the day when he returned to Europe the proud bearer of the tidings that there was a new world to conquer. The discoverer of the richest gold mine in Queensland kept the knowledge to himself for years till he could buy the land in which it is situated. Once more (and this is an important consideration) a discovery is so much a personal thing that it is not essential to its being a discovery that the object discovered should be unknown to everyone else. When Speke and Grant discovered the vast lake in the heart of Africa they found a geographical feature previously unknown to themselves and to Europeans generally, but familiar enough to the hundreds and thousands of African natives who lived on its banks. Nay, even if a man literally uncovers a buried relic, such as a Roman pavement found in the heart of London under 10 feet of accumulated soil, what he uncovers to-day is indeed to him a discovery; but it was familiar enough to the Roman artists and artisans who designed and made it, and to the Roman soldier or colonist whose house it adorned, and whose friends and family were constantly walking over it. Discoveries of things absolutely and always unknown are always rare, and in some branches of study, architecture among others, are in the nature of things impossible. But in the sense of finding out or uncovering something previously unknown to the discoverer discovery occurs frequently, and it is by far the most healthy, the most interesting and the most successful form of study. I propose, then, in this lecture to begin with the simple, but most valuable, discoveries which you as students must make for yourselves if you are really to master the art of architecture, and then to proceed to notice some of the discoveries which have taken place in recent years which are more brilliant in their character and relate to architectural matters that have long lain hid. I propose to distinguish these, and call them respectively personal and public discoveries, for there is this distinction certainly between them, that the discoveries which a student makes are mostly

of importance to him personally, but are not such as need be made public. Those which an explorer may make are perhaps quite as important to the general public as to the discoverer, and are usually published to the world.

Personal Discoveries.

The information you obtain in the offices where you work, or from attending classes like those about to begin in this college, is hardly discovery; it is instruction, and the worst of it is that, as it is not difficult to get, it is very apt not to stick in the memory. The information discovered by making researches on your own account is mostly obtained with difficulty and trouble, but it is seldom, if ever, forgotten. You may make discoveries in a library. For example, let us say that you are advised to read a handbook, say "Fergusson's History," and you do so, finding it perhaps a rather laborious task, as the reading of any condensed book always must be. You notice, however, that the numerous woodcuts all have references to the names of writers from whose publications they are copied, and having access to books, say to the Institute library, or that at South Kensington, or some other collection of books, you begin to consult some of the original authorities, and among them you discover some book of which the illustrations or the letterpress, or both, bear on what you have been reading about, and are full and clear and interesting. The book you have discovered only occupies a corner of the vast field that Fergusson travels over; but then the writer really has the leisure to take possession of that corner, and to throw a clear light upon it. The mere fact that you have to some extent unearthed the book for yourself helps to give a zest to the reading of it, or the examination of its illustrations. It is a discovery. Nor is it in a public library only that such discoveries can be made. In any collection of books or photographs or prints to which you have access, and on the shelves of second-hand booksellers and the tables of bookstalls, you can have the same good fortune. I, for example, myself possess not a few valuable books on subjects connected with architecture which first came to my knowledge through finding them on bookstalls. This reference to discovering books ought not to be made without alluding to the help to be got from one very valuable book of reference, which just now possesses a melancholy interest for some of us. I allude to the "Dictionary of Architecture," of the Architectural Publication Society, a work bristling with sign-posts—if I may use such a phrase—calculated to direct the student (in his search for knowledge) to the best sources of information. In almost all the articles the most copious lists of references occur, and it is of the greatest use to a real student to have sources of information so liberally spread before his view. This work (begun by a circle of architects, some of whom only have survived to see its completion) would have been left unfinished but for the indomitable energy and public spirit of Mr. Cates and the learning and patience of the late Mr. Wyatt Papworth, and it is impossible just now to mention the "Dictionary" without alluding briefly to the great loss which architecture has within the last few weeks sustained in the recent death of the last-named architect (Mr. Papworth). He was full of accurate and well-digested information on every subject connected with our profession. He was an indefatigable, systematic and accurate worker, singularly quiet and simple in his manner and bearing and was universally esteemed. In many ways his vast store of technical information has been made useful to the members of his profession. To you, gentlemen, his work, as editor of Gwilt's "Dictionary," the value of which he practically doubled by the additions he made to it, is pretty sure to be familiar; but there are many others and many important memorials of him in the literature of our profession, and his death leaves a blank which it will not be easy to fill up. To return, however, to students' discoveries—of which, by-the-by, the late Mr. Papworth made many and valuable ones—architecture can be better learned from buildings than from books, and it is in visits to buildings, ancient and modern, that you will make the discoveries that will be of most use to you. The most simple building, if it is good, has some secrets if you can but make them out. Why is it pleasing? Why are there certain irregularities? How is it constructed? What has been its history as a structure? These and such-like questions should present themselves to the mind, and if we can but discover the answer to one such question, the visit to the building in respect of which it is asked will have been fruitful. Among the most interesting features of ancient buildings are the traces of their history which they bear indicating the successive enlargements, alterations, rebuildings and so forth which they have undergone, and the discoveries of this sort which a keen student, examining an old manor-house or a church, a cathedral or a castle, may make for himself are extremely interesting and extremely instructive. One of the most complete accounts of such a series of discoveries illustrating the past history of a great building by its actual visible marks exists in the account of Canterbury Cathedral, from the pen of the late Professor Willis. No man during the present time of careful research has been more keen or more

* Inaugural lecture delivered at University College on Thursday evening, October 11, 1894.

successful in his examination of ancient buildings than he, and this record is a good example of the manner in which it is possible to make them tell the story of their varied changes, alterations, rebuildings and extensions. Even without a tenth part of the minuteness and elaboration of Willis's investigation, if you simply establish the broad divisions of Saxon, Norman, Early English and so forth in a building with a chequered history, and recognise the most obvious features of each period, you will have discovered the leading facts in the history of the building. In this sort of research it is peculiarly true that "to him that hath shall be given." To a person even of artistic taste and power of observation, entirely devoid of architectural knowledge, a building is almost a sealed book; but when you have got even a little knowledge from other sources a building begins to be legible. As an example, I would suggest to any student who has read something of the changes in tracery, in vaulting, and in mouldings which occur in English architecture, that when he has obtained some knowledge of these things from books he should go to Westminster Abbey cloister, getting first from Scott's book the dates at which it was done, and identify the different features of each period, and the changes both in feature and in general proportions. He will find that he has discovered a good deal of what is really meant by the terms Early English, Decorated and Perpendicular. It is possible to make discoveries on drawings of buildings as well as on the buildings themselves. As an example of what I mean: if you take the drawings of one of Sir Christopher Wren's churches and examine them carefully you may perhaps discover some of the principles upon which he designed them. He was a very orderly and mathematical worker. He had strongly impressed upon his mind the conviction that the establishment of geometrical relations between the main dimensions of his building was a means of securing that their proportions should be pleasing, and if, with this clue in your mind and a pair of dividers in your hand, you examine a series of engravings giving the plans, sections and elevations of his churches—of St. Paul's Cathedral—you will, I think, find it possible, and extremely instructive, to discover some of his methods of working. The plan and sections of St. Stephen's Church, Walbrook, generally recognised as the best among Wren's many successful interiors, will be very good to begin with. A famous place to investigate is a good museum. I doubt whether any one of you has seen, let alone studied in, all the museums of London which furnish information about architecture, though I hope most of you have studied, or will study in some. The first, of course, is the British Museum, where a very considerable amount of examples and specimens of ancient and Classic architecture exist. Setting aside the library, which is enormous, there is a great deal of Egyptian, Assyrian, Lycean, Greek and Roman work to be seen there, chiefly in the shape of fragments of ornament and features, such as a capital from the Parthenon, and parts of a sculptured column from the Temple of Diana at Ephesus. The South Kensington Museum and the connected Indian section include a great deal of Gothic Renaissance and Oriental architecture and a magnificent collection of casts, practically as good as the originals for our purpose. Another, and perhaps a finer, certainly a better classified collection of architectural casts exists at the Crystal Palace, and a third of Mediæval work at the Architectural Museum. Sir John Soane's Museum, a collection made by an architect to illustrate his art, must not be forgotten, and in every one of these a visitor, going with some knowledge to start upon and a spirit of research, cannot fail to make discoveries that will be both profitable and pleasant. We have spoken about discoveries in a library, in a building, in a set of plans. There are also discoveries in a city. Here in London architects of more or less skill have been designing and building for a thousand years. Much of their work (good or bad) has disappeared, for the relentless tooth of time has been eating it away almost as fast as it has been done—but not quite, and so in this Metropolis a vast mass of architecture, of course chiefly modern, is accumulated. The Great Fire destroyed most of the earlier work, but not all of it, and even putting that aside as most of it too well known to leave much room for discovery, there remains work of the seventeenth, eighteenth and nineteenth centuries, not a little of it hidden away, to reward the diligent investigator. This is especially true of interiors. In the parts of London which were fashionable a century ago, and where large houses were erected which are now used for different purposes—such, for example, as Lincoln's Inn Fields—you may often discover most interesting fragments of architectural work. There are a few of the companies' halls which contain good work, but little known, and in one shape and another there is a good deal to discover in domestic and secular buildings, of which the authorship may often not be known, but which is appropriate and beautiful. A long series of architects, since the days when the work of the individual architect came to be known by his name, have wrought in London, and though their prominent works may be well known, even these (some of them) may be now in obscurity, and of the best known it is, generally speaking, only the outside

that nine observers out of ten have troubled themselves about. London has specimens of the work of Inigo Jones, Wren, Hawksmoor, Gibbs, Chambers, Soane, the Brothers Adam, Wilkins, Cockerell, Barry, Pugin, Smirke, Scott, Street, Burges, Sedding, F. P. Cockerell, and many others. Here, too, are specimens of the work of able architects now living, whose designs are influencing the course of public taste at the present day, and are, perhaps, almost as much worth your study as the work of any past age. How many of these do you know about? How many remain to be discovered? And even of those you know, how many interiors have you seen? To go a step further, every cathedral town in England, every great city, every country town, and pretty nearly every village contains an example, or a group of examples, of architecture in which there is much that you can only know by discovering it for yourself; and even if England has been very thoroughly examined, and a great deal of all the architectural work has been more or less described and illustrated, there is a vast amount that is practically unknown. This is especially the case with English mansions and manor-houses, many of which, if illustrated at all, are in many cases only known from picturesque perspective views, and are not illustrated in such a way as to give an idea of their wealth of architectural treatment. The visitor to Penshurst, Knole, Hever, Bramshill, Purham, Audley End, Westwood, Hatfield, or Woollaton or Burghley, will find plenty of architectural discoveries to make, even though each of these mansions may have been more or less illustrated. That an architect should overhaul the church in any village or town where he may be, if it be of good design or possessed of features of interest, is, I hope, so much a matter of course that I do not stop to point out how much can be discovered and appropriated in journeys and country rambles; but I am disposed to dwell upon the modern work which awaits the traveller in various parts of England. The country is now thickly sprinkled with fine mansions and smaller country houses, nearly all of them good and many of them extraordinarily good. The towns are now distinguished by their town halls, their banks and other public municipal buildings, and often by the possession of a hospital or the neighbourhood of an asylum of the greatest possible interest in many cases to the student of sanitary science. Individual towns also have the impress of the work of architects of genius who have practised chiefly in and round them. You must go to Glasgow and study the work of Thomson if you want to know how Greek architecture can be turned to account in supplying the architectural treatment of modern Scottish warehouses and churches. You will in Manchester learn what a genius Walters was; for there also, and in Liverpool and in the great cities of the North of England, you will find modern work of the greatest possible value done by good architects still living and working among us. Discoveries are more obviously awaiting the traveller who may cross the Channel. It is quite true that France, Italy and Germany have been visited again and again by keen observers, and the results published; but even so, you must see the building and judge for yourself before you can grasp what is meant. Even in the most familiar building—St. Peter's at Rome, or Notre Dame at Paris, or St. Mark's at Venice—there is a world of unpublished facts to discover, and much more is this the case the moment we step off the beaten track. France especially is full of good architecture that is very little known in England, and there would be no great difficulty there in practically discovering a first-class church, perhaps even a cathedral. Spain is full of architecture very little published; the East full of what is yet practically unknown.

With regard to modern work, the discoveries that await an observant architect travelling on the Continent and taking the opportunity of visiting the great cities are startlingly numerous and strange. I have no doubt that a visitor to the United States would find them not less numerous, and certainly not less startling; but I have not been so fortunate as to see America, and I will not attempt to describe the new architecture of that great country, though I am convinced that there is a better chance of the development of a modern style of architecture in the United States than in any part of Europe. Remaining nearer home, however, the architect who will visit the great German cities, such as, for example, Frankfurt and Cologne, Brussels and Vienna, will discover that the Renaissance style on European soil is really capable of new and striking developments which we have rarely attempted. Miles of new boulevards and streets are to be seen in these and in other continental cities, full of elaborate, vigorously-designed and costly buildings, all of them (so far as they can be classed as belonging to any style) of Renaissance character, but every one of them differing from the types we have studied and are reproducing. Here, if anywhere, there are discoveries to be made in modern architecture. I do not say that the buildings are all good, but many of them are. I do not say that the details are pleasing—they are often too coarse for that; but there is a freshness, a suggestiveness, and a sense of vigour about these boulevards which make up for a good deal of the deficiency in refinement. In thus

considering what at the outset I called personal discoveries—namely, those which a student must make for himself—I have gone through that part of the subject which probably is of the greatest value to you, gentlemen, as students. But you may have expected that I should also tell you, and show you, something of public discoveries in architecture, and we will now, if you please, turn to that division of the subject. The present age has been one in which extraordinary revelations of the past have been obtained by keen investigation to an extent that could never have been anticipated. Of course, inscriptions, sculptures, ornaments, pottery, weapons and objects of this sort—but especially inscriptions—have furnished this most remarkable and definite information; but no inconsiderable amount of architecture has also been discovered. Buried remains usually display arrangements of plan rather than entire buildings; but in not a few cases they are dug up complete, while abandoned buildings have been found entire in places now solitary, and ancient structures have been discovered standing in inhabited, but seldom visited localities. Fragments, pavements, ornaments, architectural features and details, and even representations of buildings have been found in abundance. Discovery in architecture may be considered to have begun, so far as we are concerned with it, at the Renaissance in the sixteenth century. That great change in men's ideas—the starting-point of modern life and art—began in Italy, and the artists of the Renaissance soon became familiar with the remains of Roman art in their own country, and studied them with eagerness. Several of the Italian architects and antiquaries of the seventeenth century have left treatises and illustrations of Roman buildings, and their own architecture was based on that of their Roman predecessors. In the eighteenth century Italian architectural books became numerous, and many of them describe monuments; and some of the Roman remains outside Italy, as for example Palmyra, appear to have attracted notice at the same time. In the eighteenth century, moreover, the study of ancient Roman art was much stimulated by a discovery, in the most literal sense of the word, of the utmost interest and importance. I allude to the digging-up of the buried city of Herculaneum, and later on the better-preserved Pompeii. Herculaneum was known as early as 1711, but excavations at Pompeii only began somewhere about 1750. The course of exploration and discovery thus started went on, and has, with brilliant results, been continued from time to time. Nothing has shown us so much of the details of ancient architecture as the Pompeian explorations. At Pompeii, as you know, an extensive buried town has been laid bare, house by house and street by street. Exploration and the publication of discoveries are still going on there, and though the main public buildings were found and dug out long ago, most interesting houses are still discovered from time to time. It was about the middle of the last century that attention in England was seriously drawn to the remains of Greek architecture by the publication in 1762 of the "Antiquities of Athens" by Stuart and Revett. Though Athens was a well-known city, this careful examination of the most important architecture to be found there amounted to a discovery, and the effect on public taste of the publication of the work was considerable, followed as it was very shortly by the "Antiquities of Ionia." Greece and Asia Minor were by degrees most fully explored and described; but Greece has proved inexhaustible, and is at the present day a field of the most interesting modern research.

The next great series of architectural discoveries relates to the architecture of Egypt. Napoleon took possession of that country in 1799, and sent with his army an expedition of men of learning and artists, and the temples and such of the tombs as had up to that time been discovered were visited and explored, and a magnificent book full of engravings and descriptions was published. Since that day this work of exploration in Egypt has been carried further, and the magnificently-illustrated work of Lepsius, in twelve folio volumes, has published to the world the results of a great German exploring expedition there in the years 1843-45. In Egypt also exploration and discovery have still gone on, but of course the greater part of the recent results belong to the domain of archaeology rather than architecture, though the profession of Egyptology in this college has been successful in recovering much that is interesting as to Egyptian buildings. Some other fields of architectural research should not be overlooked. For example, in Asia Minor, Caria and Syria were explored successfully by Sir Charles Fellows, and Central Syria has been visited with successful results by M. de Vogué, whose discoveries are of the deepest interest in the deserted cities of Roman origin of Central Syria. His book gives representations of buildings of a sort of Roman architecture, still entire, of great grace, skilfully designed and excellently built, and standing unoccupied and uncared for in the Syrian deserts. I ought not, perhaps, to omit the many discoveries of Roman architectural remains which have taken place in this country. Usually not much more than the stumps of the walls, showing the plan of the building, the hypocausts, and in many cases the

richly-ornamented tessellated floors are recovered from such places as Silchester and the various Roman villas, but even so much has great interest and value; and in a few cases, especially in the fine Roman thermæ at Bath, excavation has brought much more to light and has revealed most of the architectural features of work of a highly-finished character, very well preserved and striking. It is by the spade that the most remarkable discoveries of modern times have been won, and none of them is more valuable than the recovery of Nineveh and other Assyrian cities by Layard, Botta and Place. Much which is not architecture has been won for us in Assyria. We have been enabled to read the letters, the books, the very accounts and ledgers and cash-books, and we have received a flood of light upon the history of all the nations of antiquity so dazzling that perhaps the architectural part of these discoveries has become forgotten. But we have recovered the plan and the lower parts of the walls of several palaces of the utmost magnificence and complexity, and we have representations of others on the alabaster sculptured slabs which extended not only for feet, or hundreds of feet only, but for miles, along the face of those palace walls. Of ancient Persia, the ruins were not buried in sand and earth to the same extent as in Assyria, and they have suffered much ruin; but here again the spade has, within no very distant period, brought to light objects of surpassing interest. A French antiquary and his wife, M. and Mme. Dieulafoi, have discovered and brought home splendid specimens of wall decorations, as embossed, glazed and coloured brickwork, now displayed in the Louvre, Paris. The gradual spread of knowledge about countries outside our own shores has brought to light architecture, not so startlingly new as was revealed by the digging up of Pompeii or the opening of the tombs of the Pharaohs at Thebes, but still of moment. These discoveries occurred to some extent in the seventeenth century; and to a great extent in the eighteenth, so that in the best-known countries, such as Greece and Italy, the explorers of the nineteenth century have chiefly been occupied by making our knowledge more complete. Such work, for example, was done by Professors Cockerell and Donaldson, and by Mr. Penrose, in Greece and Asia Minor. Such also was the discovery of the ruined remains of the mausoleum at Halicarnassus, by Sir Charles Newton, and the recovery of the long-lost Temple of Diana at Ephesus, by the late Mr. Wood. The startling results obtained by Dr. Schliemann at Mycenæ and Tiryns include the recovery of two Greek fortress-palaces, at any rate of the plans, and that of the fortifications which protected them, and of decorative details of great interest. Research at Athens, at Olympia, at various other ancient sites in Greece, and in Cyprus, Asia Minor and elsewhere, has gone on, and is being prosecuted with most interesting results (and of one discovery of Greek work I propose to show you some examples directly), and it has also been prosecuted with singular vigour and success in Rome. Very much is now known about the ancient buildings of Rome which was only matter of conjecture twenty years ago, and there is, no doubt, more to follow. Before, however, we wander too far from them, we must for a moment turn to the discoveries that have been made in Christian and in Oriental architecture. We had detected, before all this was carried so far as I have taken it, an English architecture of the greatest variety and beauty, and had learned that there corresponded with it a French, an Italian and a German Gothic style with countless examples. The important Mediæval buildings of almost all Christendom, except perhaps Spain and Portugal, have been, it is said, discovered and thoroughly examined, measured, photographed and described, and are as well known for the most part as ordinary methods of publication can make them, and yet there is not a single one of them which is not the depository of artistic secrets not enriched by subtleties or ornaments, which are not for the first-comer, all of them waiting the earnest student to discover them. Nor are the possibilities of finding more startling novelties than we expect exhausted. Very recently a large series of photographs representing Christian churches, chiefly Mediæval, in towns and cities in Apulia, on the shores of the Adriatic, have made their way to London, and we find that at Bari and the neighbouring places an Early Italian Gothic flourished, bearing a far closer resemblance to the Gothic of Western Europe than is found in the Gothic buildings of the better-known Italian cities of the west. These photographs are an example of the fact that, well as Italian art has been studied, it remains an inexhaustible mine. There remains still one phase of Christian art where much in all probability still awaits the inquirer. I allude to the art of the Greek Church. Byzantine buildings exist even in Constantinople that are barely known, and much more are they to be sought for in more remote places. Some of them have been lately studied by Mr. Schultz and Mr. Barnsley, and these will be in time made known to the world in the book of those gentlemen; but more remain. Constantinople, however, reminds us that there are countries not less extensive and populous than European ones with an art of their own, an architecture of their own and countless examples in the shape

of mosques and temples, palaces and tombs. The entire East, though not unknown, is all but unstudied. I quite admit that there is a something in Oriental art which, beautiful as it is, seems to repel European sympathy, if it awakens almost unbounded admiration. But when I mention Egypt, Syria, Persia and Japan, and above all India and Burmah, I name a whole hemisphere crowded with buildings of interest and importance, of which not one in a hundred is generally known. If any one wants a field where discoveries can certainly and readily be made, let him try India.

THE STYLE HUNTERS.*

THE practice of blindly accepting all that is contained in some particular historic style of architecture and attempting to make it the American style is one for which I have never had any friendship.

While I admire the spirit of research that places all the forms and details of any style at one's pencil point, and while it would be still more admirable if the research was extended to all styles, I condemn the judgment which permits indiscriminating copyism. Furthermore, I wish to express disapproval of the fashion of assuming that the ability to copy is the highest evidence of professional scholarship. I do not accept the ability to copy well as an evidence of artistic feeling, and I will not be governed by the notion that copying is the only "correct" and "proper" thing. The attempt to judge everything that is done by the requirements of some prevailing style is a species of intolerable pedantry with which I have no patience. It is only an application of "faddism" for which the consistent thinker should keep on hand a large dose of preventive. We should not be scared by the philippic of the narrow-minded, one-idea critic, nor by the adverse judgment of the advocates of a one-styled school curriculum, nor by the jeers of the followers of the swing from style to style, who remind us of a bumble bee buzzing from one jimson flower to another, all the while keeping up a noise to attract attention, and constantly saying, "I am on the most beautiful flower in the whole barnyard."

Every style in history has its good qualities and its weaknesses. Neither of them nor all of them are suitable for us. We must proclaim a declaration of artistic independence—perhaps wage a seven years war to free our own minds from the thralldom of the mother and grandmother styles of the past. What I contend for is thought, independent and free; I insist that not all the available things in historical work are contained in any one style or in any of the three grand divisions of the architecture of preceding ages. We must have a higher, broader and more scholarly criticism.

For many years "style hunting" has been a fashionable amusement among architects of this country. The effort now being made to force an acceptance of the Renaissance of Italy and France as the architectural style of this country recalls to mind the fact that similar efforts have been made heretofore in favour of other styles, each effort seeming to be temporarily successful but all ending in final failure, as the present effort will probably do before many summers come and go. The promoters of these different movements have all been enthusiasts in pursuit of the "favourite phantom," and each has attempted to "ride rough shod" over the fallen fancies of preceding generations of hobbyists. Each class, for the moment, has claimed to possess the "true artistic" feeling and to be the only one possessed of "good taste." Each class has written profound arguments showing why that particular phase of architectural expression was the particular one that should be adopted; but each of these generations of enthusiasts, after riding the wave of temporary applause has gone with "McGinty" to the bottom of the sea. To everybody else these races of "style hunters" seem to lead a perilous life. About the time their efforts are ready to be crowned with success some other knight in the artistic tournament mounts his charger and claims to be the true leader, and after a few artistic sword passes the older hobby, ridden to fatigue, gives up the race to the fresh steed, and the rider is tumbled off into the common herd. When we come to think of it, what "a time" these fierce generations of "artistic rainbow chasers" do have. To a man not afflicted with these beautiful hallucinations it is a play in high comedy to see the present earnest efforts upon the part of some of the alleged great designers of the country to fit all of the absurdity and weakness of Renaissance detail—as well as what is really meritorious—into present day wants, and to hear with what loud blowing of trumpet they are announced as the "learned" architects of the times, and to hear the hooting and tooting of in horns by which they are proclaimed "leaders" by the "small fry" critic and copyist. The serious character in this play is the average architect, who in this country, as elsewhere,

is compelled to earn his daily bread by the sharpening of his pencil, and in the hurry to be doing many things, and doing them quickly, in order to make both ends meet, he has no time for investigation. He takes up what he finds in use, makes the best he can out of it, uses the style while it seems to be in favour, and passes on to the next as the fashion is set by those who to him are the real leaders. It is a matter of no particular consequence to him whether his designs are Renaissance or Romanesque as long as he gets his money for them and they seem to please his clients. It is no cause for loss of sleep with him if he designs two houses for adjoining lots, one in French Gothic and the other Colonial. For a man to be thus tossed hither and thither on the wave of public fancy, being compelled to vary his preference from one side to the other as the wind blows one way or the other is discouraging to say the least. It is liable to lead him to stop short sometimes and inquire "where he is at," as I do now, for within our own recollection we have had the Gothic fashion, the Mansard fashion, the Eastlake fashion, the Queen Anne fashion and Romanesque fashion, and now the Renaissance fashion, and what fashion we shall have next even the Man in the Moon would be unable to say.

The series of attempts to engraft a foreign style upon this country is a succession of chapters of copyism. These generations of copyists have had little respect for each other's work, usually not enough when the completion of a building has been involved to carry out the design of their predecessors. They have all been iconoclasts in each other's camp, and each newcomer has sent the lares of the former tenant to the rubbish-heap, only to have its family gods desecrated in the same manner by its successor.

These movements that come and go like the tides of the sea, however, result in the tendency to establish firmly in the minds of both architect and public the facts, first, that none of the old styles can be adopted in this country; second, that they all contain admirable qualities and all contain incongruities and absurdities; third, that all need a regeneration or a complete transformation in order to be legitimate artistic progeny of our civilisation.

Architecture is an art of precedents. All races of builders throughout all history have gone to the storehouse of existing work to gain a supply of information, and have felt free to make such use of what they could find as would be instrumental in expressing their own ideas. Many of them have gone through a succession of experiments, such as we have, in first trying to use some other style before producing one of their own; but as such experiments have always resulted in failure, these labours of the "style hunters" have been removed, have disappeared and been forgotten as the taste of the time became more highly cultivated. Naturally the incongruities resulting from wholesale cribbing from foreign art became unbearable, and these buildings were the first to give way to new structures or to be boldly stripped of their more objectionable features. No one presumes that any one of the great styles of architecture of history was born. They all grew through centuries of time, as ours must do. We cannot buy, borrow or make architecture to order, and we must not appropriate a style by copying its details. We may study its principles and receive suggestions from its forms, but it is the underlying idea of each form and detail that is to be made the subject of inquiry. We may learn how they clothed their ideas with line and form and colour, and thus learn the principles which underlie all architectural expression. We must rise above all styles and orders so as not to be fettered by them, or to have our views of the countless productions of art obscured, just as the producers of all historic styles have done in their times. To copy details in architecture is like committing the demonstration of a theorem in geometry to memory. It enables us to say over again what the book says in the same way the book said it, but it gives us no clear idea of the problem we have attempted to demonstrate. Those who devote themselves to a style fall into the practice of using any detail anywhere about a building, although it may have originally been intended for some particular place. And they are in the habit of using the same detail whether working in iron, stone, wood or clay, no difference for what material the detail was originally designed. Instead of all this our ornament should have an appropriateness to the material in which it is produced, and the place it occupies, and the building for which it is designed. It should have a meaning to us in our day, and it should be the best we can make of the existing opportunity and the means at hand. The use of steel and electric light is a thing of this day, and they must not be turned down as not being architectural. They must be used as other materials have been used in the past so as to reach the highest possibilities of their employment, but we must not try to use steel with forms suitable for stone, and we must not use our electric light and insist upon placing it where we would a candle.

The question then arises, How are we to use what we find in the architecture of the past? The answer to this question is much too long to be given in a paper like this, if, in fact, it can be given in anything like completeness. A few points

* A paper read by Mr. J. W. Yost at the Annual Convention of the Ohio Chapter of Architects.

only must suffice for the present purpose. First, it is ideas, not forms or details, that we must seek—the underlying idea and not the manner of expression is the prime object of inquiry. Second, the observation and study of existing work furnishes a field of suggestions to the mind as to what ideas can be and ought to be expressed in architectural design. Third, we should learn the science of design, through the aid of which we may be taught how to express our own ideas, so that the designer will be able to express joy or sorrow, grandeur, beauty, stateliness, devotion or frivolity at will. When we have thus learned what to express and how to express it we will be free to produce designs in architecture as the musician, with a knowledge of the scales, is to write the great musical productions of the world.

HASTINGS CASTLE.

THE committee of the Sussex Archaeological Society and several of the subscribers to the Hastings Castle Excavation Fund on the 10th inst. inspected the dungeons, when a paper was read by Mr. Charles Dawson descriptive of the excavations. He said it was not to be supposed that the present gateway of the castle, from outside which access is obtained to the dungeons, was the original gateway. A wall ran across the bottom of the present pathway to the castle, the main entrance to which was probably through the barbican towers on the east side. A light wooden bridge was probably thrown across the moat on to the outer ward now known as the Ladies' Parlour. The two entrances to the dungeons were evidently situated within the bastion of a large tower, of which now a portion only remains. The entrance to the dungeons was in half an octagon. On two sides were doorways leading downwards in north-eastern and south-eastern directions. A steep flight of ten stairs descended on the north-east side. They are now worn with deep grooves. The arched masonry terminates above the lower end of the stairs, where there are traces of a movable door having been fixed. The passages forward are all hewn out of the sandstone rock. Throughout the whole of the series of galleries the roofs and arches are invariably rounded, and their solidity and almost entire absence of ornament gives a decidedly early Norman aspect. From the foot of the stairs a short passage suddenly turns to the south-east, terminating in an arch slightly grooved at the sides. Through this arch is an irregular-sided chamber about 3 feet high cut in the rock. On the side of the chamber to the right there is traced the outline of a round-headed arch, apparently designed as an entrance to connect these galleries with the south-easterly series of passages, a design not completed. In the opposite wall to this tracery is another passage carved in a singular and skilful manner. The pick marks are obliterated and the surface rubbed smooth. On the termination of this passage there is an arch, being the commencement of another passage but left unfinished as a mere recess. There are marks, however, of preparations for erecting a door. On the left hand the passage proceeds almost due east, and at the junction of these passages there is some appearance of groining in the roof. Proceeding along the main passage, now about 9 feet high, there is a hole in the ceiling as if a light was suspended at this point. At the further end to the right is another tracing of an arch of a doorway, apparently designed to communicate with the others by another series of galleries. The passage then comes to an abrupt termination forward, but turns to the left in a northerly direction. Near this angle are a number of holes in the wall, some made in a slanting direction as if intended to retain better the wood with which they were plugged for fastenings, which no doubt were used for detaining prisoners. At the end of the passage, high above in the roof, is a large hole running forward to the east. It had been tested for about 15 feet, but the outlet had not been found. It was believed to have been for ventilation.

Proceeding down the short passage to the right it is found to end abruptly, but to the right again in a backward westerly direction is a peculiarly-shaped round domed chamber, separated only from the two adjoining passages by a slight thickness of rock. There are two concave bassetts like fireplaces side by side. In the top of the pillar opposite to the right hand of the doorway are more holes for fastenings, arranged in such a manner that the detention of prisoners is immediately suggested to the mind. There is no chimney to this chamber, and though there is a quantity of black ash on the floor (the late custodian stating that some inches covered the floor at one time), yet the walls are not blackened, leaving one to suppose that the fuel employed was charcoal. There is yet another fireplace in the thickness of the wall of the archway. It is extremely difficult to suggest any apparent use for this small chamber and its fireplaces other than a sinister one. Several notches cut in the walls appear to have been used for the support of planks or beams, but no system of arrangement has yet been discovered. Returning again to the starting-point, and taking the stairs leading in a south-easterly

direction, it will be noticed that the roof is constructed in masonry in a similar manner to the other staircase. The six rock-hewn steps wind round a pillar of rock on the left side of the doorway. The state of the steps here is very different to the former stairs, and appear hardly to have been used. When first discovered they were filled in with *débris* which had come in through the broken roof masonry near the foot of the stairs. On clearing away the *débris* the earth continued to run in as fast as it could be cleared out, so that a wooden lineal shelf had to be sunk through the "made earth" from the surface between the wooden palings in the castle mount and the curtain wall. The first attempt proved unsuccessful, and when the excavation was nearly completed bad weather came on and the shaft collapsed, the workmen narrowly escaping with their lives. However, a second attempt proved successful, the roof was repaired, and six stairs were found leading into a small round chamber. Outside the right of this chamber appears another arch entered by two steps and opposite a small round-headed niche as if for a light to be placed. The passage suddenly terminates in the tracing of an arch.

Among the *débris* was found a number of animal bones and a small fragment of carved white marble, portion of the head of a statuette, probably belonging to the old chapel, which had fallen in with the *débris*. Portions of the foundation of the great castle curtain wall were exposed on the left hand. These were composed of water-worn stones from the shore, the limpet shells still clinging even after the lapse of eight centuries. It is now quite certain that these excavations have been left in an incomplete state for two reasons. The original designers were under the impression that the sandstone rock was of the same texture throughout, whereas it appears that only a belt of hard sandstone rock exists of a sufficiently sound nature to tunnel. Probably the masterly curving and twisting of the passages is due to the desire to keep within the solid belt. Every attempt on the part of the old workmen to extend the passages was thwarted by the rock to the south being of an unsubstantial nature, while on the north but little remained between them and the outside of the castle bank. However, the discovery is of extreme singularity, and is a unique addition to the already intensely interesting old castle. There appears to be only one castle in England bearing resemblance in its galleries to these at Hastings, namely, Pontefract, in Yorkshire. In some places the description of the Pontefract galleries by Mr. Clark in "Mediæval Military Architecture" reads almost like the Hastings Castle galleries themselves, but at Pontefract occur pointed arches which appear to denote a more recent origin. There is a growing tendency among writers to classify all galleries as storehouses for use in case of siege or as means of drainage. The galleries at Hastings do not appear suitable in design for either of those purposes. Moreover, among the ancient denizens of the castle it is to be feared, from documents which have lately come into the hands of the excavators, that there were persons of unpleasant and unscrupulous character and morals to an extent which in later times we could hardly conceive possible. Were not their convictions attested by the bishops of their own period? The Earl of Chichester deserves thanks for his kindness in allowing these researches to be undertaken, and it is hoped that at a future time more much-needed exploration may be carried out for the purpose of acquiring a better knowledge of this most interesting castle.

ARCHITECTURE AND WORSHIP.

AT the Church Congress in Exeter, among the papers read was one by Mr. W. B. Richmond, A.R.A., on "Architecture and Decoration as Aids to Church Worship." He said it was tempting in these days, which were full of puerile as well as offensive novelties, such as the new art, the new literature, new criticism, and other products of the signs of decadence, to fold one's hands and watch the progress of events, and to become more and more conservative, lest, by any chance, any statement or criticism might place one within the rank of the progressive prigs. Art was a subject worthy of the consideration of such meetings, because, while it had become a dependent on the Church, it was once one of its buttresses. Though it was not to be apprehended that any one of his audience desired our sacred edifices to be decorated by the new art, or that new literature and criticism should poison our inherited ideals, it was to be presumed that they all wanted an improvement or the present state of ecclesiastical art. They would like to revive methods of work, and to weaken the strictly commercial spirit by which religious art was environed. Churches were the palaces of an invisible King, into which had flowed so abundantly the highest achievements of man's creative powers when the Church was in active union with art of all kinds. Those palaces of the King could be of two kinds—noble by their grave austerity, as the cell of St. Francis; or resplendent with silver and jewels, mosaic and marble, as the shrine of St. Mark upon the shores of the Adriatic. There was, how

ever, a medium below these which could not be desired. A shoddy concern, and the art by which it was maintained, was of that character—indifferently theatrical and quite ephemeral. There was a plethora of it grown as well as growing. This was a result of ignorance prompting a desire for trash, and a sign of vulgarity which demanded ornament under all circumstances. It also demonstrated a want of discrimination and an absence of reserve so characteristic of a class which longed for Brummagem, and adorned itself with sham jewellery and artificial flowers. The evidences of its existence were shown in a great deal of modern art, and it had crept already into ecclesiastical structures and their appointments. Carvings were made to order, run out cheaply from those in stock; a commercially turned-out reredos was erected on a well-known pattern, bearing considerable resemblance to a Twelfth cake, naïf, perhaps, with a little sugar-plum mosaic, rivalling by its insel brilliancy the Christmas crackers. Maybe some ill-carved and commonplace saints occupied niches, or an oil-picture, the copy of an old master, resembling an oleograph, might depress still more the monotony and dulness of the whole design. The stained-glass window was a great fetic of the pious world, and there was a great trade in that commodity. It was of two kinds, the trade and the art window, but, granting that there were a few notable exceptions, the one was pretty nearly as valueless as the other. Hundreds of both were turned out every year with machine-like precision and rapidity. In the place of robust design, full of meaning, and such manly work as the twelfth, thirteenth, fourteenth, fifteenth and even sixteenth-century artists made, we were asked now to accept mawkish sentiment, weak or pretty saints, who, if they were like their portraits, would have flinched from the gridiron and become hysterical in the Roman amphitheatre. The sacred central Figure of Christianity was too often misrepresented as a characterless weak man to whom no one would go for advice much less worship. Go to Chartres, Assisi, Santa Maria Novella, York, Tewkesbury, Rome, Verona, Orvieto, Wells, Venice, Lincoln, Exeter, and try to persuade themselves that the work was designed by architects and carried out by that trade, and they would fail to be so persuaded. Or go to some of our homely English churches before the parson and the tradesman-architect had had the temerity to pull them about and shave every particle of vitality off them. If they had lived in those days of intense life and feeling they would have seen the architect or the master workman (that was his proper name) employed on the building in common with his assistants; the sculptor, in reality the mason, busy revealing the treasures of his imagination, making the stones live under him; window painters painting their dreams directly on the walls like men. The causes of this change were manifold. Puritanical dread of idol worship had dismissed the painter and the image worker, and the opening of churches on a Sunday only had rendered it useless to make them beautiful. But the forces of centralisation had narrowed the sphere of art to of religion. Painters had filled exhibitions and neglected churches; decorators were regarded as little above house painters; in place of sculptors, third-class carvers were employed to execute from architects' feeble reflections of continental visits, and architects delegated to themselves the choice of tints and the ordering of colours. Superficially stated, the remedies were simple—to desire the best, to know the best, to spend no money but on the best. The middlemen must be a thing of the past; the Church authority must get into immediate and candid relation with the artists, whoever they might be; the painter and sculptor must be satisfied with moderate gains, leaving the idea of making a fortune to members of the Stock Exchange, and they would be in part paid by the happiness of doing healthy work. So we should regain something of what we had lost. In the place of feeble decoration we should have virile work, the Church would gather once more the sympathy of real artists, and she would thereby be strengthened, broadened and humanised, as well as refined.

A NEW "SURVEY OF LONDON."

MESSRS. A. & C. BLACK have for some time been making arrangements, which are now completed, for the production of a new "Survey of London." The last edition of Stowe and Strype's famous work was issued in 1754; Maitland's Survey appeared in 1756; Entick's Survey in 1766; Lambert's Survey in 1806; since that time, though there have been many books written on London, on parts of London, and on institutions of London, there has been no actual Survey of London. In this long interval London has extended far beyond the modest limits of its walls and suburbs of 1806. Then, the City, reckoning from Westminster to Vapping, stretched for little more than three miles along the north bank of the river. In its widest part it was no more than three-quarters of a mile. At the present moment the jurisdiction of the London County Council covers an area, including the old City, which is roughly seventeen miles long

by twelve miles broad. The whole of this area is to be included in the new Survey. The editor, director and the principal writer of the work is Mr. Walter Besant, F.S.A., who has made a study of London, not only in books, but in exploration of the streets, the occupation of his leisure hours for more than twenty-five years. His recent works on London and Westminster and his eighteenth-century novels sufficiently prove his qualification for the post of director. The work will not be a reproduction brought up to date of Stowe and Strype, but an entirely new work on a different plan. It will, however, include a perambulation such as is found in the former work, but of the whole "county" instead of the City only. This perambulation will take account of every important building, institution and company; every church, chapel, college, school, hospital, orphanage, almshouse, museum, library, &c., in the whole of Greater London. It will include things past as well as the things present; it will contain a history of London—its liberties, charters, trade, political power, religion, manners and customs, and it will present a picture of the great City as it is from every point of view. In short, it is the aim of the publishers and of the editor to erect a monument worthy of this great and venerable City which shall record its state and condition at the end of the nineteenth century. It is at present designed to complete the work in eight quarto volumes, and the first will, if possible, be published in the autumn of 1895, to be followed at short and regular intervals by successive volumes. It is needless to add that the work will be fully illustrated by maps and engravings. We hope, however, the publishers will endeavour to obtain technical assistance when the buildings are described.

THE RESCUE OF EGYPTIAN HISTORY.

IN a letter to the editor of the *Times* Professor Flinders Petrie writes:—The destruction of the monuments and historical record of Egypt, which is going on year by year, threatens soon to leave no history to be further recorded. Every season sees buildings ruthlessly destroyed for the sake of materials, and a host of objects plundered by the natives from towns and cemeteries, in order that they may be scattered without name or record among the tourist flock. Even those objects which pass into museums have lost most of their importance and of their value in losing all record of their original place and circumstances. The laws of Egypt may be excellent in theory, but in practice it is perfectly well known that hundreds of persons join in this destruction—yet no man is punished for it.

There is, then, the most urgent need of saving all that is possible by complete and careful excavation, in which the history and meaning of every object shall be traced and recorded as it is found. To any person not acquainted with the practical work of excavation it might seem that so long as things are not actually destroyed it does not matter whether it be an Arab or a trained observer that may find them. But there is generally more history involved in the position and details of a discovery than in the object found. Fossils are worth but little if their strata are unknown. More scientific material has been destroyed than preserved in many of our excavations—even by Europeans and Egyptologists.

To avoid this prevalent system of mere plundering, trained hands and heads are needed to observe and to record. Such is the scarcity of suitable workers at present that even the Egyptian Government is obliged to leave most of its excavation in the hands of natives, from whom no record is ever obtained or expected. Before we can begin the salvage of the wreck, which is breaking up fast before our eyes, we need men who can put information in a permanent form as they discover it. In short, scientific training is indispensable.

But at present there is no means of acquiring such training. The Egyptian Government is concerned to keep its antiquities safe and to find objects for its museum. The French school, liberally maintained by the French Government, is concerned with the desirable work of copying, reading and publishing inscriptions. The Egypt Exploration Fund is concerned with excavating temples and finding big monuments, and it has never supported any students. There are no regular and independent workers of any nationality except one or two English. No public body does anything for the great subject of the civil life, archaeology and anthropology of the country, and there is no place where any student can get training in the very elements of archaeological research.

There is no lack of men willing to do such work; several have applied to me since Egyptology has been at last publicly established at University College. My earnest wish is to be able to encourage such workers and to see a sound British school of scientific archaeology established in Egypt. The first and most essential step is to be able to help men who come forward, and to cover their expenses and costs of work. The historical results and the objects procured by excavation in any

reasonably good site are an ample justification of the cost incurred. I have never had cause to repent of a single year's work out of the twelve years that I have spent; not one year would I have back again at the price of losing its results.

The aim of the Egyptian Research Account which is now established is not to undertake great clearances or exploits in the country, but to fit men for work of the highest class archaeologically, and at the same time benefit our knowledge and our museums as far as may be, by means of their excavations. The organisation of such a scheme should grow up spontaneously to fit the requirements and opportunities that arise, and no cut-and-dried rules could be suitable to begin with. Until the need for other regulation may arise the present position is that Mr. Hilton Price, the director of the Society of Antiquaries, attends to the financial side of the receipt and custody of all subscriptions. A cordial response has been made in many quarters, and over 200l. has been received or promised in the last three months; but certainly far more than that is needed, and could be spent with full advantage in the coming winter. Audited accounts will be annually rendered, and a publication of the work done will be given to each subscriber. As to the actual work, I hope to superintend two or three able and suitable men whose expenses may be thus partly provided for, and who will work in the neighbourhood of my own private excavations year by year. A very good ground for such work has been applied for this year; and, without any cost whatever to the Research Account, I shall be on the spot carrying on my own work, and be able to help and guide the new enterprise. Whatever antiquities may be found in this work for the Research Account will be divided amongst public museums, with due regard to the localities of subscribers; but no money will be used in carrying great blocks, which might as well remain in Egypt.

The public should bear in mind that the English Government—true to its traditions—does nothing whatever for work in Egypt. The Prussian, French and Italian Governments have each executed grand and invaluable work by scientific expeditions and publications. The only action of the English Government has been to place English students at a great disadvantage in Egypt, by giving up all common international rights of theirs to compete for any public appointments connected with antiquities. The credit of English work must therefore—in face of these serious disabilities—rest entirely on the public spirit of individuals, according to the usual English system. I hope to see arise in the next few years an active and capable school of English workers who will worthily develop the study of the life and civilisation of Egypt which was so ably begun by Wilkinson; but such a school must depend upon the support of the intelligent public which will, I trust, be freely given to such an enterprise.

BABYLONIAN ANTIQUITIES.

SINCE the British Museum researches in Babylonia ceased at the end of 1882, the spade of the Arab digger has been at work for the benefit of different Bagdad dealers in antiquities, but with no little loss to science, seeing that for every object found by the lawless excavator about half a dozen valuable antiquities are destroyed.

Both the French and the Americans have, says the *Times*, been digging in South Babylonia for some years past; the former at Tel-Loh and the latter at a mound called "Niffir" where formerly Layard and Loftus excavated. With the exception of a few objects which have made their way to France and America, whatever they found has been taken possession of by the Ottoman authorities. It may be remembered that since Mr. Rassam's exceptional privileges obtained for him by the late Sir Henry Layard while Ambassador in Constantinople, which enabled him to send to the British Museum everything he found in Assyria, Babylonia and Armenia, the Porte has persistently refused to allow the agents of foreign museums to appropriate or export any antiquities out of Turkey. The consequence is that whatever is found in the excavations or obtained by purchase by such agents is taken possession of by the Turkish Government. Under these rules no fewer than forty-seven cases of antiquities from the American diggings and about 12,000 inscribed clay tablets of those of the French, discovered by M. Sarzac at Tel-Loh, have been appropriated by the Imperial delegate and sent to Constantinople.

At Sippara, or Sepharvaim (the site which was discovered by Mr. Rassam for the British nation about fourteen years ago), the Ottoman authorities have been carrying on lately extensive operations under the superintendence of a Latin priest. At that place a large collection of inscribed clay tablets have been found and despatched to the Turkish capital. According to calculation there must be at the present time no fewer than 50,000 newly-discovered inscribed objects at the Imperial Ottoman Museum in Constantinople, obtained from different Babylonian sites, and the Assyrian scholar may find there

ample store for his study, which might add materially to the existing knowledge of the ancient history of Chaldea and Assyria.

Two black basalt statues, covered with fine inscriptions, have also been found by the Arabs; one at Imjaileeba, the site of the great palace of the kings of Babylon, where Belshazzar was supposed to have held his impious feast, and the other in a cave near Nimroud, on the opposite side of the Tigris, about twenty miles to the south of Mossul. These images have also been appropriated by the Ottoman authorities and sent to Constantinople.

The greatest find by Arab diggers of inscribed objects that has come to light lately was at Tel-Loh, after M. Sarzac, the French agent, left. They discovered a large chamber full of inscribed clay tablets, most of which they sold to Armenian, Syrian and Jewish brokers for exportation to England, France, Germany and America. Part of the collection has already reached London and Paris, but the remainder has been seized by the Ottoman authorities at Bagdad, and some of the Arabs have been arrested and fined for breaking the law. Unfortunately, the local authorities "lock the stable door when the steed is stolen," because they try to stop the illegal digging when it is too late to prevent valuable antiquities from being destroyed through the negligence and apathy of the Turkish officials.

LUCCA CATHEDRAL.

REFERRING to our paragraph in *The Architect* of the 5th inst. with regard to the proposed restoration of this building, it is satisfactory to know that the cathedral is scheduled as a national monument, and that any money which the local committee may be able to collect will be expended in works of repair and reinstatement, under the direction of the Minister of Education and Fine Arts. Any design for alterations to the cathedral will have to be approved by the Minister, who is assisted by an able staff of assistants, and if the rules recently promulgated by the Education Department are adhered to in the proposed restoration, there will be little cause for regret.

GENERAL.

The Duke of Cambridge has opened the new technical schools built by the Corporation of Maidstone at a cost of about 12,000l.

Mr. T. G. Abercrombie, of Paisley, has been selected as architect for the new grammar school, which is to be erected in that town at a cost of over 18,000l. A swimming-bath, gymnasium and workshop may also be erected in connection with the school.

Mr. J. H. Craigie has been successful in the competition for the Alexander Thomson Memorial Prize, which is open to Glasgow students. There were six competitors.

The Royal Scottish Academy recently obtained a new charter. They have now applied to have the supplementary charter amended. The amendments appear to be directed to keep the Academy a close society.

The "Old Glasgow" Exhibition, which has been held in the Fine Art Galleries, Sauchiehall Street, closed on Monday evening. In regard to the representation of antiquities, it is thought improbable that such an historical exhibition can be equalled in future.

It is proposed to rebuild the Royal London Ophthalmic Hospital on a site between Peerless Street and Gayton Street, City Road. Messrs. Lander & Bedells are the architects.

Dr. Charles Rieu, formerly keeper of the Oriental manuscripts at the British Museum, has been elected to the St. Thomas Adams Professorship of Arabic, in succession to the late Professor Robertson Smith.

A Women's Hostel, it is stated, is to be built at University College, Aberystwyth, and the sum of 13,000l. is to be expended on it.

At a Meeting of the Langholm Burgh Commissioners a letter was read from the Duke of Buccleuch, offering as a free gift to the town of Langholm the town hall and its site. The building was recently renovated by the Duke, to whom it belongs.

The Report of the Manchester Southern Hospital, after referring to the donation of 70,000l. by the Lewis Trustees, says that the building of the new hospital has not yet been commenced, because various arrangements involving delay had to be made, and numerous changes in the former plans and in the scheme of administration of the two institutions had yet to be considered and matured. The committee, however, hoped that in the course of a few months these arrangements would have been completed, and meetings of the subscribers to that institution and also to St. Mary's Hospital would then be convened to consider the scheme of amalgamation, with a view to obtaining the consent of the subscribers.

The Architect.

THE WEEK.

TIME, the transformer, can point to novel undertakings, but not often is one more startling than the conversion of the great castle of Norwich into a museum and art gallery. The buildings are far more impressive than those of Dover or London. Whether King CANUTE or ROGER BIGOD was the creator, the castle was intended to resist the utmost that could be done by the military power of the time, and its strength was repeatedly tested. Originally there were three nearly circular concentric lines of defence, each consisting of a wall and ditch, enclosing a ballium or court; besides these there were the keep, in the innermost ballium, and a barbican or outwork to defend the entrance. The whole comprehended an area of not less than twenty-three acres. The keep, which dwarfs all the buildings near it, is 110 feet 3 inches from east to west, including a small tower, through which was the principal entrance; from north to south it is 92 feet 10 inches; its height to the battlements is 69 feet 6 inches. The interior consisted of two floors, with a basement about 24 feet in height. The walls in some places are 13 feet thick. It was a happy thought to utilise the grim stronghold for educational purposes. As the Duke of YORK, in opening the museum on Tuesday, said:—"This ancient castle and keep, which must have witnessed many strange and stirring scenes, is about to present itself in a new character. First a fortress, then a prison, there must have been more of sorrow than of joy in the history of its past. Now all this has been changed. The prison cells have been turned into a beautiful museum and fine art gallery, which will provide healthy recreation and instruction, not only for your citizens, but also for the people of the county of Norfolk." It is to be hoped that the rooms in the old building will be enriched by many works of art, but a visit will be always repaid by the consideration of the series of events exemplified by the new destiny of the castle, and which is as remarkable as the conversion of swords into ploughshares.

THE death of EDWIN CLARK on Monday night removes another of the survivors of the great engineers of the past generation. Born in 1814, he was young and vigorous when ROBERT STEPHENSON selected him as his principal lieutenant for the construction of the Britannia Bridge. The experiments which were undertaken in order to discover suitable "tubes" were made by EATON HODGKINSON, and the constructive works of the Menai Bridge were in charge of FRANK FOSTER, but the organisation of the whole undertaking was entrusted to EDWIN CLARK. Afterwards he wrote a book in two volumes on the bridge, which must always be prized as an engineering classic. The experience gained by Mr. CLARK in utilising wrought-iron he afterwards turned to account in the construction of hydraulic graving docks and canal lifts of that material. The block system of railway signalling was also introduced by him. For several years he was chief engineer to the Electric Telegraph Company. He carried out many important works in various parts of the world. EDWIN CLARK was one of the highest types of the modern civil engineer, and among all the varieties of his undertakings there are none which can be called failures.

THE Parish Councils Act is likely to be advantageous to lovers of the picturesque, for the duty of preserving footpaths and tracks, which, although of ancient use, cannot be considered as roadways, will be thrown on the new bodies. Hitherto the Legislature has left the defence of such rights in the hands of private persons or societies. Under the new Act, however, it is specifically laid down that a public right of way in a parish is not to be stopped, and a highway in a parish is not to be declared unnecessary and not repairable at the public expense without the consent of the parish council, and that consent is not to operate if a parish meeting dissent, and a month's notice has to be given to enable them to dissent. A parish council may also undertake the repair and maintenance of any footpath in their

parish. In view of this Act, and the obligation it casts on local authorities to take cognisance of matters that have hitherto been somewhat ignored, the footpath preservation societies will in future stand on a new footing. They will not be superseded, for useful work can still be done by such organisations in watching the operations of the Act and endeavouring to have the provisions carried out. There is, however, not much use in having means of access to picturesque spots if, on arriving, they are found to be degraded by advertisement boards.

A COMPETITION was lately arranged in Mayence for the new Protestant church, which has become a necessity. Beside the church there were to be two parsonages, a residence for the sexton, a meeting-room for committees, and connected with the church a baptistery, two confirmation halls, waiting-rooms, &c., were to be provided. Designs were submitted by five architects from Berlin, Darmstadt, Mayence, and Stuttgart. The Romanesque style was adopted by Herr OTZEN and Herr SCHWECHTEN; Gothic by Herr SCHWARTZE, and Italian by Herr KREYSSIG and Herr NECKELMANN. The judges have awarded first-class premiums to Herren OTZEN and KREYSSIG, second-class to Herr NECKELMANN, and have recommended the purchase of the remaining two designs.

AN International Convention of Master Painters and Decorators was opened on Tuesday in Manchester. Mr. SUTHERLAND, the president, explained that the object was to lay the foundations of a society which would have jurisdiction over the area of the United Kingdom, and which would have for its object the welding together into one harmonious fabric the trade, craft, or profession—call it what they would—of the painter and decorator. One resolution passed was that the members of the Institute of House Painters and Decorators and the painting trade generally should be advised to discontinue the practice of employing unattached boys, and that an earnest endeavour be made to revert to the wholesome habit of indenturing boys to the trade. A paper was read about the practice of hawking and selling by auction job lots of room-papers. It was declared by the Convention that the practice was inimical to the best interests of the trade, and that a committee be appointed to further consider the matter and report upon the same to the executive of the new association as a basis of concerted action.

THE interest which is taken in plumbing is shown by the returns of the examinations of the City and Guilds of London Institute. The numbers during the last few years have been successively 569, 684, 825, 988, and this year the number has risen to 1,253, showing an increase of 265, the largest yet reached. Of these 1,253 candidates 652 have passed, 192 in the honours grade. At the practical examination, which is optional and of sufficient difficulty to indicate that the candidate who passes is a skilful plumber, 450 candidates presented themselves, as against 293 in the previous year, and of these 202 satisfied the examiner. Of these 202, 168 also succeeded in the written examination, and will receive the certificate of the Institute. Owing to the large increase in the number of candidates, arrangements were made for the practical examination to be held in forty-four centres outside London, as against twenty-seven in the previous year, and in order to prevent any failure in the results of the examination, in consequence of a difference in the quality of the material provided for the candidates, all the material, consisting of sheet lead, pipes, and solder, was forwarded from London to the forty-four centres of examination. At each centre a local examiner was appointed to superintend and report upon the candidates' work, and at the close of the examination all the work was returned to London to be marked by the chief examiner. The amount of material used in this examination was 13 tons 12 cwt. There was also an increase in the number of candidates in plasterers' work. The quality of work sent up for examination is not yet of a high order. It is, however, expected that the encouragement given by the Plasterers' Company to the study of this subject, by the offer of valuable prizes, will lead gradually to a desire on the part of those engaged in the trade to profit by the opportunities of instruction which are now offered.

LANCASHIRE.*

AS Lancashire is so peculiarly modern in all things it needs some reflection to realise that the county has a very ancient history. It was therefore excusable for matter-of-fact people to maintain that the late MADOX BROWN was indebted to his imagination for a few of the subjects which are represented in the Manchester Town Hall. Any sceptics of that kind will be confounded if they glance over the pages of Lieutenant-Colonel FISHWICK'S volume, which is the latest addition to Mr. STOCK'S series of "County Histories." As we have more than once explained, there is no fixed plan for the histories, and in the case of Lancashire the author has treated his subject under the following divisions, viz. Pre-Roman Lancashire, the Romans as Conquerors and Rulers, Roman Remains, the Saxon and the Dane, the Normans and the Plantagenets (1066-1485), Lancashire in the Time of the Tudors (1485-1603), the Seventeenth Century, Religion, the Rebellions, Progress in the Eighteenth Century, the Dawn of the Nineteenth Century, and finally a chapter relating to local customs. It will be evident from the list that Lancashire is no creation of yesterday, and that it was the theatre of many stirring events.

From its natural character the county was a part of England that seemed to invite invaders. It was approachable from the sea on its western side, the pasture was so general it was attractive to nomadic tribes, the rivers served instead of roads and the mosses were useful as defences. It is evident from the remains that long before the Romans arrived in disciplined battalions, Lancashire afforded shelter to a succession of wandering tribes. In the parish of Rochdale neolithic implements were found in twenty-five places. Celts also, as in modern times, made their homes in Lancashire, and Brigantes, Segontii, Voluntii, &c., but these names may not express all the racial varieties. At Heathwaite Fell is a site of a settlement "near half a mile long by 700 yards wide, which has been encompassed by a stone wall originally 2 feet thick." At Holme Bank, Urswick, the settlement was arranged as a five-sided figure. Mr. SWAINSON COOPER has concluded from the enclosures of the Furness district that they belonged to settlers who were able to live in peace with their neighbours, for there are no remains of a fortified structure. It is supposed "the smaller courts were the living apartments, and were no doubt covered with some kind of roof; the larger enclosures were for the cattle, or possibly for the lower order of tribes who held the place."

The natives were able to give trouble to the Roman invaders. Apparently JULIUS AGRICOLA, whose biography by his son-in-law, TACITUS, is one of the masterpieces of ancient literature, found it no easy task to 'subjugate a half naked people who were endowed with many estuaries and woods, which favoured barbaric warfare and were obstacles to heavily armed troops. In few parts of England were roads more necessary for strategic movements, and accordingly "the main Roman roads in Lancashire are all believed to have been constructed during the Higher Empire, that is, at or before the time of HADRIAN (A.D. 117-28)." A castrum was constructed where Manchester stands, and in 1773 WHITAKER gave a long description of the parts which had survived. The manner of construction can be inferred from one sentence in which he says "various parts of it have been fleeced of their facing of turf and stone, and now show the inner structure of the whole, presenting to the eye the undressed stone of the quarry, the angular pieces of rock and the round boulders of the river all bedded in the mortar and compacted by it into one." Around the castrum houses arose, but as a settlement Mancunium was inferior in importance to Ribchester on the Ribble, which was protected by the largest castrum in the county. According to a local doggerel:—

It is written upon a wall in Rome:

"Ribchester is as rich as any town in Christendom."

The number of articles found in the neighbourhood suggests that the verse-maker was supported by evidence enough. Lancaster was another Roman settlement where the castrum has been superseded by the castle and church,

and the boundaries are no longer discernible. Among the relics found in the city was an altar dedicated to MARS COCIDIVS, a British god who was permitted to enter the Roman Pantheon. After four centuries of foreign occupation the natives had advanced,—"the culture of the land was improved, the people were shown how to make roads and build houses of stone, mines were opened, iron was smelted and shops were built."

When the Romans departed Lancashire declined in civilisation. It became part of Northumbria, and subsequently part of Deira. The Danes in turn took possession of it. For several centuries the people were enabled to test many varieties of oppression, as "at one time they were governed by kings of Northumbria, at another by kings of England; at one time they were ruled by only tributary kings, or even only by tributary earls; sometimes the Christian religion was upheld, and sometimes they were referred back to WODEN and THOR and ODEN." A few remains of the early Saxon possession have survived, but the condition of the county prior to the Conquest was not satisfactory, as will be seen from the following description by Colonel FISHWICK:—

In the time which immediately preceded the coming of the Conqueror, Lancashire must have been very sparsely populated; in every part of it there were vast forests and great stretches of moss and fern; agriculture was everywhere neglected; towns, in the modern sense, there were none; but here and there, clustering as if for protection round some Saxon thane's castle or fortified dwelling-place, were groups of wooden houses and rude huts, and scattered sparsely over the country were the clearings (*assarts* or *rods*) and the *tons* of the primitive settlers, with, in some districts, a wooden building doing duty as a church. Except where the old Roman roads were still in use, the means of passage from one place to another were difficult and dangerous; the people were of many tribes and nations—remnants of ancient British families, Angles, Saxons, Danes, Scandinavians and even Normans contributed to the general stock—and as there were many tribes, so were there various religions, although Christianity had now become the general accepted faith. But for all this, much had been accomplished by time and experience to prepare the mind of the people to accept the tenet that union is strength, and that only by an undivided kingdom could come peace, wealth and prosperity.

It is remarkable that in Domesday Lancashire is not comprised among the English counties. The divisions are to be sought in Cheshire or Yorkshire, in Westmorland or Cumberland. The fortunate retainers of WILLIAM did not value their acquisitions, any less on that account, nor were the immense forests less attractive to the Norman hunters. Nowadays it is difficult to associate Lancashire with forests, or to believe that not only individuals but whole districts were made to suffer for infractions of forest laws. But the importance of the county from its forests is evident when we find that "as late as 1697 a royal warrant was issued to the foresters and other officers of the forests, parks and chases of Lancashire, calling upon them to give annually an account of all the king's deer within the same, and also to report how many were slain, by whom and by whose authority."

The Norman lords erected castles at Clitheroe, Lancaster, Liverpool, Hornby, Fouldrey, Thurland and elsewhere. They were also most liberal in erecting churches and other ecclesiastical buildings. Colonel FISHWICK gives much information about the condition of Mediæval Christianity in Lancashire. The priory church of Lancaster appears to have possessed extraordinary importance. Furness, one of the offshoots of the Abbey of Savigni, in Normandy, was another favoured house. The community in course of time attained wealth, but a law case which arose about half a century after the suppression, reveals, from the glimpse it gives of monastic landlordism, that a man who was one of the tenants was not rack-rented, and was in an enviable condition if compared with the vassal of a secular lord:—

Between the abbots and their tenants there appears to have been carried on a system of barter and exchange, some of the details of which are preserved in the evidence brought forward in support of a petition made in the duchy court in 25 Elizabeth (1582-83) by the tenants of Walney against the Queen's Attorney-General, who had obtained a lease of the late dissolved monastery. One of the witnesses, who was then seventy-eight years old, said that they (the petitioners) and their ancestors, whose estates they severally held, used to pay and deliver to the abbot certain "domestical" provisions, such as calves, sheep, wheat, barley, oats and the like, and for recompense they not only enjoyed their burgages or messuages, but also received from the abbey great relief, sustentation and commodities for themselves and their children, viz. all the tenants had weekly one ten-gallon barrel of

* *Popular County Histories: a History of Lancashire.* By Lieutenant-Colonel H. Fishwick, F.S.A. London: Elliot Stock.

ale; the tenants of Newbarns and Hawcoat had all the worthings (manure) of all the horses and oxen (except those at the abbot's stables); the tenants had also a weekly allowance of coarse wheat bread, iron for their husbandry, gear and timber for the repairs of their houses. In addition to these grants, all tenants who had a plough could send two men to dine at the monastery on one day in each week from Martinmas (November 11) to Pentecost (Whit Sunday); and the children of the tenants who had found the required provision were educated in the school of the monastery free, and allowed every day a dinner or a supper; and if any of them became good scholars they were often made into monks. The question at issue between the tenants and the Attorney-General was that whilst he demanded the provisions, he claimed exemption from making the recompenses, alleging that the abbots had merely given the food out of benevolence and devotion to their neighbours. The result of the petition was in favour of the tenants.

Another fine church, and happily well preserved, is at Cartmel, and belonged to the Augustinian Canons. The Præmonstratensians possessed two houses at Cocker-sand and Hornby. Whalley was a Cistercian abbey, and according to WHITAKER the community "continued for two centuries and a half to exercise unbounded hospitality and charity, to adorn the site which had been chosen with a succession of magnificent buildings, to protect the tenants of its ample domains in the enjoyment of independence and plenty, to educate and provide for their children, to employ, clothe, feed and pay many labourers, herds-men and shepherds, to exercise the arts and cultivate the learning of the times." It was one of the conditions of monastic benevolence that the receiver was not humiliated, and if kindly feelings towards Roman clerics still exist in Lancashire the origin may probably be traced to old obligations. The people are not of an ungrateful turn, and we can understand why at the time of the suppression "there was a very strong party in favour of the old form of religion; and this wholesale doing away with the institutions which had so long been established in their midst met with almost open rebellion." Certain rural parts were the greatest losers, for it is remarkable that "in what is now the diocese of Manchester, between 1291 and the suppression there were not a dozen churches erected, whilst during the reign of HENRY VIII. seven were built." We are not to suppose that the seed of the reformed doctrine fell on stony soil throughout Lancashire. The county supplied two of MARY'S victims as well as many exiles, but it was on the whole the most steadfast part of England in clinging to old beliefs.

While so many were contending over doctrine, trade was working out its destiny. Manchester in 1533 was already reputed as the foremost among English towns for textiles, but of the woollen sort. Science had not in those days revealed the knack of deception. The manufacturers were ignorant of chemistry, and as a result we learn from LELAND how, in consequence "of their honesty and true dealing, many strangers, as wel of Ireland as of other places within this realme, have resorted to the said towne with linnen yarn, woollen and other wares for making clothes." Liverpool, which we suppose was accepted as a rival of Manchester in the sixteenth as in the nineteenth century, was supposed to have fallen into decay under HENRY VIII. The port was treated as a dependency of the port of Chester, and in 1558 it possessed only a dozen vessels, the largest having a burden of 40 tons. Prosperity was, however, coming towards the Mersey as well as to other parts of the county. The Tudor times could not be entirely perfect, and for men who were stubborn and faddish they were not agreeable. The builders of Lancashire at least could not complain of the effects of the transition from feudalism:

The towns and villages greatly increased in number, size and importance, and the time of Elizabeth especially witnessed the erection and rebuilding of some of Lancashire's finest halls. The ancient domestic houses which had been the residences of the old feudal lords were now remodelled or entirely swept away, and the subdivision of the land brought out a new class of proprietors who, though not descended directly from the old owners of the soil, soon took up the rank of gentry, and built for themselves those smaller though not less interesting mansions which at one time were found all over the county. During the Tudor time were built such houses as Speke Hall, near Liverpool; Ordsall Hall, near Manchester; Little Mitton, the home of the Sherburns; Ince Hall, Cleworth Hall, Smithells Hall, Lostock Hall, Lydiat Hall, Rufford Hall, Belfield Hall, Rawcliffe, Rossall Grange and a host of others far too numerous to mention. Many of these date back to very early days, and were originally built with a view to make every man's house his castle; but with the end of the sixteenth century other views began to obtain, and an Englishman, for the first time probably in the country's history, commenced to feel that

his house was really his castle, and that it was defended for him by the strong arm of the law.

A constructive period of similar importance is not to be traced in the history of Lancashire until the close of the eighteenth century, when King COTTON attained a power of which Queen BESS could not dream. Before that time was reached the county was destined to pass through much tribulation. The Civil Wars have cast their shadow over the seventeenth century, and the Jacobite rebellions over the eighteenth, while the contemporary struggles of industry appear of no account in the turmoil. HARGREAVES'S spinning-jenny, KAY'S flying shuttle, ARKWRIGHT'S rollers and CROMPTON'S mule were insignificant to those who were proud to wear Prince CHARLIE'S cockade. BRINDLEY and the Duke of BRIDGEWATER were likewise not revered as historical personages. The Muse of History, like other hangers-on of mythologies, has had, however, to submit to Fate, and is obliged to record that the universal influence which Lancashire has gained and the new power which enabled England to resist Europe in arms were conferred by those mechanics.

It is a strange story which the historian of Lancashire has to relate. A man who is romantic is no more fitted to relate it than one who is of a theological turn. The county has been everything by turns, and nobody could venture to say how many variations are to pass over it. Colonel FISH-WICK seems to us to be proud of the present and sanguine about the future state of Lancashire, but his modernity does not permit him to treat the past with contempt. He seems to have sympathy with all periods, and his volume has attractions which are rarely found in books which pass for histories.

GREEK SCULPTURE IN RELIEF.

AS a general principle the Greeks considered the ground of figures in relief to be the real wall, or whatever the solid plane might be, and not to represent air as if it was a picture. The art with them was thus rather the union of sculpture with architecture than a union of sculpture with the conditions of painting. That this was founded on the most rational principles will be evident from a few simple considerations. The shadows thrown by figures on the surface from which they project at once betray the solidity of that surface. In the attempt to represent, together with actual projection, the apparent depth of a picture, or to imitate space, figures which are supposed to be remote are reduced in size; but although thus diminished in form, they cannot have the strength of their light and shade diminished; and if deprived of shadow by inconsiderable relief, they cease to be apparent at all when the work is seen from its proper point of view, that is, at a sufficient distance, having no distinctness whatever in the absence of colour, but by means of light and shade. In short, the art thus practised has no longer an independent style, and only betrays its inferiority by presenting defects which another mode of imitation can supply. A passage in Vitruvius proves that the ancients were not unacquainted with perspective, and the same author states that perspective scenic decorations were first employed by Agatharcus at Athens in the time of Æschylus. However greatly the science may have been advanced by the moderns, this may be sufficient to prove that the absence of perspective in Greek bassi-relievi was not from an absolute ignorance of its principles, but from a conviction that they would be misapplied in sculpture.

In carefully keeping within the limits, however narrow, which defined the style of rilievo, the great artists of antiquity failed not to condense into that style the utmost perfection compatible with it, while the various applications of the works suggested abundant variety in their treatment and execution. The British Museum contains unquestionably the finest existing specimens of this branch of sculpture in the rilievo which decorated the Parthenon, or Temple of Minerva, at Athens.

The figures which adorned the pediment are separate statues, although in their original situation, casting their shadows on the tympanum, they must have had the effect of bold alti-relievi; the circumstance of their being thus completely detached must have given the greatest distinctness to their forms, and as they occupied the highest part of the building, their gigantic size and complete relief made them fully effective at a considerable distance. The sculptures which adorn the metopes or spaces between the triglyphs are in alto-relievo. Those in the British Museum, representing combats with the Centaurs, were taken from the south side of the building; the subjects were varied on the other side, but they mostly related to the warlike exploits of the Athenians. It has been well observed that the subjects of combats, usually chosen for the

metopes in Doric temples, afforded opportunities of composing the figures so as to produce diagonal lines, which effectually distinguished the groups from the architecture, and at the same time had the effect of reconciling the vertical forms of the triglyphs with the horizontal lines of the epistylum and cornice. The compositions in question all fully occupy the space destined for them, and are calculated, from their treatment and relief, to produce the utmost possible effect.

Those works which received the open light were thus boldly relieved from their ground to ensure the masses of shadow which make them conspicuous; the principle, applicable to external architecture, that projection commands shade, was thus extended to external decorations; and care seems to have been taken to keep the light on the figures as unbroken as possible, especially as the whole series of metopes occupying the external frieze was more or less crossed by the shadow of the cornice. This precaution necessarily limits the attitudes, for many actions equally natural with those adopted would have projected shadows on the figure itself, thus tending to confuse the forms. A statue which can be seen from various points and sometimes in various lights might thus be unfit as to its composition for that intelligible display in one view and under a constant light which rilievo requires. On the principle that high relief is fittest for the open light, the rilievo of the temple of Phigaleia, which are also preserved in the British Museum, are bold in their projections. These works adorned the interior of the cella, but as the temple was hypæthral, or lighted from the open sky, the principles of external decoration were applicable. Had the temple been imperfectly lighted, a flatter kind of relief would have been preferable, and this leads us to consider the style of *basso-rilievo*, properly so called, the most perfect existing specimen of which is also in the British Museum. It adorned the external wall of the cella of the Parthenon within the peristyle or colonnade, and was consequently always in shade; the strongest light it could ever receive would probably be the reflection from the pavement below when the sun was highest, but as reflected lights are uncertain and may proceed from various points, the sculptures in question were calculated to be equally distinct in whatever direction the light was thrown. Their great elevation, and the peculiar angle at which they were seen, owing to the narrowness of the space between the exterior columns and the cella, may also be mentioned in considering the reasons which rendered projection unavoidable. That this confined view was not, however, the sole reason may appear from the bold relief of the Phigaleian marbles, which, in the interior of the narrow cella of the temple they adorned, must have been seen on the side walls at a very inconsiderable distance compared with their height. The Phigaleian temple was built according to Pausanias, by Ictinus, the chief architect of the Parthenon; and although the sculptures are inferior, as works of art, to the generality of Greek specimens, their style of relief is precisely the point where the architect may be supposed to have influenced their execution.

As projection commands shade, so flatness commands light, and the flattest relief is hence fittest for an invariably dark situation. The same principle is observable in architecture in the treatment of mouldings in interiors, the form and projection of which differ materially from the corresponding members in the open light, and which are intended to be seen at a distance. The flatness which insures light would, however, be altogether indistinct and formless unless the outlines were clear and conspicuous at the first glance. The contrivance by which this is effected is by abruptly sinking the edges of the forms to the plane on which they are raised, instead of gradually rounding and losing them. The mass of the relieved figure being sometimes very little raised in its general surface, its section would thus almost present a rectangular projection. In many instances the side of this projection is even less than rectangular; it is undercut, like some mouldings in architecture which require to be particularly distinct, and thus presents a deeper line of shade. But if the figure can thus command distinctness of outline, notwithstanding the inconsiderable light it may receive, it is obvious that its lowness or flatness of relief will in such a light greatly aid its distinctness; above all, this contrivance gives the work thus seen in an obscure situation the effect of rotundity. Indeed, it is a great mistake to suppose that the flat style of relief was intended to appear flat, and it is a great mistake to apply it in situations, as in the open air, where it must appear so, and be indistinct besides. The conventions of the arts are remedies, adopted in certain situations and under particular circumstances, and are supposed to be concealed in their results; their ultimate resemblance to nature, and their successful effect in those circumstances, are the test of their propriety and necessity. The absence of all convention in *alto-rilievo* (as opposed to the flat style) thus fits it for near situations, if not too near to expose it to accidents. The excellent sculptures which decorate the pronaos and posticum of the Temple of Theseus, although under the portico, are in bold relief. They were not only nearer the eye and seen at a more convenient angle than the flat rilievo of the cella of the Par-

thenon, but the reflected light which displayed them would necessarily be much stronger.

It is also to be remembered that only the end porticoes, where the sculpture could be more conveniently seen and was better lighted, were decorated with rilievo; the side walls of the cella were unornamented, and undoubtedly bold relief would have been less adapted for them. The Temple of Theseus was built about thirty years before the Parthenon; and it is not impossible that the satisfactory effect of the flat rilievo on the cella of the latter might have suggested a similar treatment, or some modification of it, in the Temple of Theseus, had it been erected later. It may be observed, in general, that *alto-rilievo* can seldom be fit for interiors, not only from its liability to accident, but from the difficulty of displaying it by the full light which it requires. A superficial light, especially if in a lateral direction, necessarily throws the shadows of one figure on another. Instances of this occur in some of the palaces in Rome where works of sculpture have been injudiciously placed. A room, for example, lighted in the ordinary way will have its walls (at right angles with that occupied by the windows) adorned with a frieze in considerable relief; the figures nearest the light consequently project their shadows so as to half conceal the next in order.

The conditions of proximity and distance, as well as the quantity and direction of light, were carefully attended to by the Greek sculptors, and suggested new varieties of relief. The end of the art, as far as relates to execution, is accomplished when the work is distinct and intelligible at the distance whence it is intended to be viewed. Hence the conventions which are intended to correct the defects of distance, of material, want of light, &c., are evidently unnecessary where the work admits of close inspection. The style of *mezzo-rilievo*, which in its boldest examples presents about half the thickness of the figure, is, on many accounts, least fit for a distant effect; the figure is nowhere detached from its ground; at a very little distance its shadowed side is lost in its cast shade, and its light side in the light of its ground; the outline, in short, soon becomes indistinct; but the semi-roundness of the forms is directly imitative, and thus again the absence of all conventional treatment fits the work for near situations. The style was preferred to *alto-rilievo* in such cases, as the latter would have been more liable to accidents, and would besides in some measure deform the outline or profile of any object which is circular in its plan.

The *mezzo-rilievi* on the miniature choragic monument of Lysicrates may be admitted to have been fitly calculated for their situation because they must have been seen near; but there was in this case an additional consideration to be attended to. The building is circular, and *alto-rilievo* was avoided in order to preserve the architectural profile; on the other hand, the frieze of the small temple of Victory, which was rectangular, was adorned with *alti-rilievi*, and in this case it appears that they did not even extend to the angles. The objections to sculpture on monumental columns will be obvious from these considerations; it has been observed that in attempting to preserve the architectural profile, as in the Trajan column and its modern rival in the Place Vendôme at Paris, the sculpture thus slightly relieved soon becomes indistinct, nor indeed would this indistinctness be obviated at a considerable height even by *alto-rilievo*, the figures being necessarily small, while the evil is only increased by substituting the dark material of bronze for marble.

We proceed to consider the varieties of style in this art as affecting composition. In rilievo, and in sculpture generally (a colourless material, or a material of only one colour being always supposed), it is evident that shadow is the essential and only source of meaning and effect. In works placed in the open air, and visible in one point only, as in the case of *alto-rilievo*, a certain open display of the figure is generally adopted; the shadows, or rather the forms which project them, are so disposed as to present at the first glance an intelligible and easily recognised appearance, and the impossibility of changing the point of view, or changing the light, as before observed, limits the attitudes more than in a statue, and, as will also appear, more than in a *basso-rilievo*. For in the latter, however distinct the outline is in which the chief impression and meaning of the figure reside, the shadows within the extreme outlines are in a great measure suppressed; it is, in fact, by their being so suppressed that the general form becomes so distinct. This is also the case when one form is relieved on another; it will be seen that the nearest object is very much reduced and flattened in order that its shadow may not interfere with the more important shadows of the outlines on the ground, and hence it may often happen that the nearest projection is least relieved. It will thus be evident that, owing to this power of suppressing the accidental shades, and preventing them from rivalling or being confounded with the essential ones, the choice of attitudes becomes less limited, and many a composition which in full relief would present a mass of confusion from its scattered and equally dark shades, may be

quite admissible and agreeable in basso-relievo. Accordingly the attitudes of statues, which are generally unfit for alto-relievo, frequently occur in the flat style. Visconti even supposes that certain figures in the bassi-relievi of the Parthenon suggested the attitudes of celebrated statues afterwards executed, as, for instance, the Jason or Cincinnatus, and the Ludovisi Mars. As a remarkable proof how much the attitudes were limited in alto-relievo compared with the flat style, it may be observed, that the contrasted action of the upper and lower limbs, which gives so much energy and motion to the figure, is perhaps never to be met with in the fine examples of alto-relievo, whereas in the flat style it is adopted whenever the subject demands it. This disposition of the lower limbs, or the alternate action in which one of the arms would cross the body, never occurs in alto-relievo, because the shadow of the arm on the body or of one of the lower limbs on the other could then no longer be suppressed, as it is in this case, but would rival the shadows of the whole figure on the ground. Among the metopes of the Parthenon, the Phigaleian marbles, and the alti-relievi of the Temple of Theseus, there is not a single instance of the contrasted action alluded to, while in the two latter examples the contrary position, or open display of the figure, repeatedly recurs, even to sameness. It must, however, be admitted, that this open display of the figure, although not presenting the most energetic action, is as beautiful as it is intelligible, and hence the finest exhibitions of form were quite compatible with the limited attitudes to which the sculptors thus wisely confined themselves. The objections which compelled this limitation being however entirely obviated in basso-relievo by the power of suppressing at pleasure the shadows within the contour, we find the fullest advantage taken of the latitude which was thus legitimately gained.

A better example cannot be referred to than the flat rilievi already mentioned from the cella of the Parthenon. The subject represents the Panathenaic procession, and although no perspective diminution is admitted, several equestrian figures are sometimes partly relieved one upon the other. The confusion which results from the number of similar forms in the repetition of the horses' limbs, as well as in the actions of the horsemen, must be admitted; but perhaps the subject is thus better expressed than by a simpler arrangement, and this treatment contrasts finely with the single figures. In a procession of horsemen moving two or three abreast, we are at once aware that the figures are similar, and the eye is satisfied, as it would be in nature, not in searching out each individual figure as if it had a separate principle of action, but in comprehending the movement and the mass, for one indicates the whole. Where the figures thus cross each other they are treated as a mass; the outline of the whole group is distinct and bold, being more or less abruptly sunk to the ground, but the outlines which come within the extreme outline are very slightly relieved. In short, the principle here applied is precisely the same as that observable in a single figure in the same style of relief; the outline of the whole form is distinct, or rather most distinct where it is most important, and the internal markings are seldom suffered to rival it, but are made subservient to this general effect. The relative importance of the objects is, indeed, the only consideration which is suffered to interfere with this principle; thus loose drapery is sometimes slightly relieved on the ground, while a significant form is now and then strongly relieved even on another figure. In comparing the slight varieties of treatment in these rilievi, it is to be remembered that the end porticoes were a little wider than the lateral colonnades. It is undoubtedly to this circumstance that the difference of treatment alluded to is to be referred; the figures in the end friezes are more separated from one another, and consequently somewhat more relieved than the compact processions on the side walls.

The fact that these bassi-relievi, as well as most of the sculpture of the ancients, were partially painted, has been purposely left out of the account, because the very contrivances resorted to are calculated to supply the absence of colour. The ancient sculptors added colour after having employed every expedient which could supply its want, the moderns, in altogether rejecting it, often fail to make use of those conventions which its absence demands.

It appears that the principle of suppressing the relief within the extreme contour which, with the strong marking of the outline itself, mainly constitutes the style of basso-relievo, was employed by the ancients in works of considerable relief, in interiors, in particular lights, and probably at some distance or elevation. The real projection which works thus strictly belonging to the class of bassi-relievi may sometimes present, points out the essential difference between basso and mezzo-relievo—a work, even if in very slight general relief, which has the parts that are nearest the most relieved, belongs to mezzo-relievo; while a work which has the nearest parts least relieved, constitutes basso-relievo, whatever its general projection may be. In the former the outline is thus less apparent than the forms within it; in the latter the outline is more apparent than the forms within it. The early Greek and

Etruscan rilievi, which, however flat, have the nearest parts the fullest, while the outline is scarcely, if at all, rectangular in its section, have thus the principle of mezzo-relievo. They are even fitted for near inspection, and cannot be said to present any unsatisfactory convention; for the bulk, however really thin, is proportionate in its relief, and is so far directly imitative, inasmuch as the eye consents to a diminished scale of bulk as easily as to a diminished scale of height, while the indistinctness of the outline has the effect of rounding the form. Such works are besides fitted for near examination, because they can scarcely command any shadow.

The Egyptian intaglio, for so it may be called, rather than rilievo, belongs to the same style. The Egyptian artists, instead of cutting away the background from the figure, sunk the outline and slightly rounded the figure, on the principle of mezzo-relievo, within. Thus no part of the work projected beyond the general surface, and the architectural profile was preserved. There are, however, many very ancient examples at Thebes of figures slightly relieved from the ground, somewhat on the principle of basso-relievo, as practised by the Greeks—that is, with the nearest parts least relieved and with outlines rectangular in the section. Many of them probably in their original situations, and when the buildings were entire, ornamented interiors. The Egyptian rilievi were painted in brilliant colours, and would have been ineffective in the open light without such an addition.

The distinctions of the three styles of relief, according to the Greek examples, may now be thus recapitulated. In the highest relief, however decided the shadows may and must of necessity be on the plane to which the figure is attached, the light on the figure itself is kept as unbroken as possible, and this can only be effected by a selection of open attitudes—that is, such an arrangement of the limbs as shall not cast shadows on the figure itself. In basso-relievo the same general effect of the figure is given, but by very different means; the attitude is not selected to avoid shadows on the figure, because while the extreme outline is strongly marked, the shadows within it may be in a great measure suppressed, so that the choice of attitudes is greater. Mezzo-relievo differs from both; it has neither the limited attitudes of the first nor the distinct outline and suppressed internal markings of the second; on the contrary, the outline is often less distinct than the forms within it, and hence it requires and is fitted for near inspection. Its imitation may thus be more absolute and its execution more finished than those of either of the other styles.

ABERDEEN ARTISTS' SOCIETY.

THE annual exhibition of the Society has just been opened by the Marquis of Huntly, the president. Lord Huntly, in opening the exhibition, said he must protest at having been asked to perform upon a second occasion that very interesting ceremony. He did not, however, blame the committee for having done him the honour, because that was the second exhibition of what he might call the resuscitated Aberdeen Artists' Society. It was all very well to say, as he noticed the newspapers had done, that that exhibition was the seventh that had been held; but he might remind those present that there was a hiatus in the history of the Aberdeen Artists' Society, and it was only by the active exertion of a few ardent friends that the Society again came into existence four years ago. They were now met that day to open the second exhibition of that resuscitated Society; and he thought he might say on behalf of the Society that they were not ashamed to ask the public of Aberdeen to come and see the collection of pictures that had been got together. It was a collection of pictures that not only showed great advance on the part of the artists of the present day, but it also brought before the public of Aberdeen a collection of works of those who had gone from them, which any part of the country would not be ashamed to see in their midst. They had to thank a great many citizens of Aberdeen for the interest they had taken in the Society. He would not mention their names, for they were known to most of those present; but he could not forbear mentioning publicly the debt they owed to their indefatigable secretary, Mr. Emslie Smith. Proceeding, Lord Huntly said he had only two words to say in connection with the exhibition. The Aberdeen Artists' Society did not exist only for the purpose of collecting works of art for the benefit of those who were able to come in the daytime to see them, but its aim was to produce an exhibition, and to open it to the public at such a low cost that every man, woman and child in Aberdeen could come and see it and have relaxation in these rooms. They had to thank the managers of the Art Gallery for placing the rooms at their disposal, and they did their best to meet this kindness of the managers by opening the exhibition in the evening at a most reasonable cost, in order that every person in the town might have an opportunity of seeing it. He hoped the citizens would be as responsive on this occasion as on the last, and if this was

so the Aberdeen Artists' Society would indeed continue to be, as it was now, in a very thriving condition. The only other word which he had to say was that they had endeavoured in the exhibition to produce some of the works of a great Aberdonian artist, John Phillip. He alluded specially to his works in order to point out to those who looked at them that they would see in the earlier efforts of Phillip a very different style from those of his later works; in fact, one could hardly believe it was the same artist that painted the magnificent picture on his left (*The Early Career of Murillo*). This work would show to the rising artists of the present day that where a man had any love of his art and worked steadily at it he could rise to even as great a position as John Phillip did, and he trusted there were some amongst them in Aberdeen who would leave as imperishable a name as Phillip did.

GEORGE FREDERICK WATTS.

THE first of the series of Saturday evening lectures on art subjects to be given this season was delivered in the Glasgow Corporation Galleries by Rev. Malcolm McLean, B.D., of Brodick, who took for his subject "George Frederick Watts, R.A." The chair was occupied by Bailie Shearer, the convener of the galleries committee, who, in introducing the lecturer, expressed the gratification of the galleries committee at the appreciation with which the lectures had been received by the public, and indicated the nature of the series of which this was the first. The lecturer began by giving a short account of the painter's early art career and the hopes he entertained through fresco-painting of elevating the character and broadening the sphere of art in the country. The scant encouragement given to him in this direction, without altering his ideas of the aims of art, made him work them out in his own studio. Throughout his long career, as the lecturer showed, he had been true to the purpose which he believed all high art ought to serve—preserving what is valuable in the national character, interpreting what is difficult in life and reconciling men to the harder decree of destiny. A tribute was paid to Mr. Watts's power as a portrait painter, and to the fact that many of the most distinguished men of the age had sat to him—statesmen, divines, &c. The allegorical side of Mr. Watts's art, the side by which he is best known, was then dwelt upon, comparing him in this respect with Albert Dürer and William Blake. The lecture closed by a summary of the painter's philosophy of life, as shown in his various works. Mr. McLean's lecture, which was listened to with the closest attention, was illustrated with a beautiful series of slides from the works of the artist.

KEIM'S MODE OF WALL DECORATION.

A LETTER in the *Times*, from Mrs. Lea Merritt, gives the following account of another process of wall decoration:—The beautiful mosaics designed by Richmond in St. Paul's Cathedral have certainly given a new impulse to ecclesiastical art, and at this moment many may wish to beautify their churches who have not the means for this gorgeous and expensive method, undoubtedly the most beautiful. Painting in fresh plaster, as successfully practised in Italy, is entirely unsuited to our climate, for the plaster itself decays very quickly under the influence of the moisture and carbonic acid gas in the atmosphere. Oil pictures on canvas glued to the wall generally show some glossy surface. The glue in damp weather permits the canvas to sag or expand. Tempera painting is equally perishable. The spirit medium lately introduced does not harden the plaster on which it is painted.

There is, however, a method of which a first experience has been made during the past year on the walls of St. Martin's Mission Church on Blackheath, near Chilworth. It is the invention of Adolf Keim, of Munich, and in that city has been extensively used. The walls are prepared in a scientific manner, eliminating lime almost entirely. The painting-ground consists of marble dust specially prepared with a proportion of infusorial earth. This, after being laid on the rough-cast, is prepared in such a way as to become very porous and firm of texture. The painting is done with colours ground in distilled water, and only chemically pure water may be used. The pigments are of a wide range and fine quality. The work is carried out necessarily with that precision and simplicity which the old fresco method enforced, but one may have the advantage of retouching a little at the last. The colours are finely set by a series of careful applications of a kind of silicate, applied very gradually and with reference to the varied absorbent qualities of special colours. When the fixing is complete the surface is exceedingly hard. It requires great force to break it, and the painting, which has no gloss, but a beautiful, neat, granulated surface, may be washed freely, or will even resist exposure to rain and open sunlight.

At present artists using this method will have to import the colours and chemicals, but there is expectation that they may soon be made in this country. The preparation of the wall was done by a country builder, following the directions given from Munich.

The church—and it is a most beautiful and original little model, designed by Mr. C. Harrison Townsend—is quite near Chilworth Station, on the South-Eastern Railway, and I shall be very happy to give all information about the process to any artist desiring it. Of the pictures now complete, that of *The Resurrection* is not yet entirely fixed in some of the darkest colours. The other paintings may be washed or tested in any way.

GLASGOW ARCHITECTURAL ASSOCIATION.

AT the meeting of this Society, Mr. A. N. Paterson presiding, a lecture was delivered by Mr. P. McGregor Chalmers on "The Abbeys and Cathedrals of Scotland." He pointed out that local tradition, however interesting, was but a fabric reared by memory and imagination; it could aid us but little where scientific accuracy was required. It might be thought that in the mass of literature published since Scott revived the interest of Scotchmen in the beauty of their own country and its history there would be found all the material necessary for the history of our abbeys and cathedrals. Closer acquaintance, however, convinced one that it was seldom more than a local tradition. The writers generally have been men of culture, but with exceptions they had no knowledge of art. Turning to ancient charters we might think to have at last found some foundation, but the writings of past ages had been a most prolific source of error. An illustration in point was in the charters relating to the building of the central tower of Glasgow Cathedral, a part of the erection commonly attributed to Bishop Wishart. The lecturer said this was erroneous, and that the tower really erected by Wishart, and restored by Lauder, was the north-western tower, so foolishly removed sixty years ago. It was a favourite practice for a local magnate or chief prelate to have his arms carved on the building erected or restored by him, and in this connection he argued that the arms of Archbishop Blackader, which appear on the remarkable aisle of Car Fergus, were not a record of building, but only of restoration. The presence of names or arms was not an infallible guide in study; that infallible guide must be found in art itself.

TESSERÆ.

Architects' Certificates.

A CERTIFICATE that the work has been done in a satisfactory manner means a document or expression (it may be by word of mouth) which states the fact directly or indirectly; and a letter from the architect merely enclosing a builder's account checked by him is not a certificate. The certificate is valid without reference being made in it to the amount that may be due to the builder. When it is stipulated in the contract between the employer and contractor that a written order must be given for extra work and no such written order is given, yet if the architect at the end of the engagement makes a certificate allowing such extra work, it is conclusive and final, unless his conduct has been fraudulent. If the parties to a building contract expressly stipulate that the certificate of the architect shall not be set aside on any ground, or on any charge of fraud or collusion, then, even if fraud on the part of an architect is proved, the certificate is binding.

St. Pancras Church and the Inwoods.

The Classic church which was the conjoint work of William Inwood and his son Henry, is in its kind and in its peculiar beauties unique among the churches of the Metropolis. The building was commenced July 1, 1819, was completed May 7, 1822, and cost 76,769*l*. The exterior of the body of the church is with certain necessary deviations an imitation of the Ionic Erechtheum on the Acropolis at Athens; the tower is an adaptation from the building commonly called the Tower of the Winds, also at Athens, which is properly the Horologium or water-clock of Andronicus Cyrrhestes. The measurements and drawings of these buildings were made by Henry Inwood on the spot. The semicircular apsis at the east end of the church supplies the place of the straight west wall of the Pandrosion or temple of Pandrosos, which adjoined the Erechtheion at the west end. The two covered buildings which project from each side of the east end, forming the entrances to the catacombs of the church, are adaptations from the south portico of the Pandrosion. The caryatid figures, of which there were six, four in front and one at each side, were in the place of columns and supported the pediment of the south portico of the Pandrosion; the opposite north portico had

columns. There is one of the original caryatid figures in the Elgin-room of the British Museum. The sarcophagus beneath each roof indicates the purpose for which the projecting buildings have been constructed. The two Ionic half columns engaged in the walls on both sides of the west end are additions made to form an apparent basis for the tower. The windows are adaptations modelled in accordance with the form of the doors. Grecian temples had no windows; large temples had a central portion of the roof open to the sky; small temples generally received light only from the door, which was wide and lofty. The octagonal tower, with its two ranges of eight columns each, in its form and general effect combines well with the building and portico, and is in itself an object of peculiar beauty. In the interior the galleries are supported by very elegant slender columns. The ceiling is flat and formed into a number of ornamented panels. The general effect of the interior is good though rather deficient in light, especially below the galleries, from the small size of the windows. William Inwood was born about 1771. He was brought up to the professions of architect and surveyor. He was employed as steward to Lord Colchester, was surveyor to a large number of persons, and several architects were instructed by him. He had two sons, one or other of whom was employed conjointly with himself in most of his larger works of architecture, and he was assisted generally in all his professional pursuits by both. He died March 16, 1843, aged about seventy-two. Henry William Inwood, the eldest son of William Inwood, was born May 22, 1794. He was several years in Greece, and examined with great care the architectural remains at Athens and elsewhere, and made plans and drawings of them. He assisted his father in most of his architectural pursuits, especially in designing and constructing St. Pancras Church, and had he not suffered so much as he did for many years from ill health, would probably have attained to great eminence as an architect. His death is supposed to have occurred March 20, 1843, about which time a ship in which he had sailed for Spain was wrecked and all on board perished. Charles Frederic Inwood, second son of William Inwood, born November 28, 1798, besides assisting his father in his works, was the architect of the church of All Saints at Great Marlow, in Buckinghamshire, which was completed in 1835. He died in May 1840, aged forty-two.

St. Francesco, Rimini.

The church of St. Francesco at Rimini is one of the earliest and most satisfactory examples of the restoration of the Classical style. It was erected by Sigismund, the most distinguished of the Malatestas, who had ruled over Rimini for a long series of years. In his declining age Sigismund formed the plan of erecting a church, which should be the mausoleum not only of his own family, but of those who had been his companions—the poets, the philosophers and the artists who had enjoyed his patronage—that those who had been his companions during life might be united to him in their sepulture. For this purpose Sigismund commenced the church, and the architect whom he employed adopted the Gothic style. When the building, however, was far advanced, it would seem that some of the artists or literati patronised by Sigismund recommended the adoption of the Classical style, then arising in Florence under the great master Brunelleschi. With this intent Sigismund sent for Leon Battista Alberti, the Raphael of Italian architecture, who, when he surveyed the building, found that he had a task of no ordinary difficulty to accomplish. He recommended that the interior of the building should continue unaltered, but that the exterior should be completed in what may be termed a Classical style. This he accomplished with extraordinary power, exhibiting, perhaps, a more complete appreciation of Classical antiquity than even Brunelleschi himself.

Doorways.

In Classic temples there was only a single lofty doorway within a portico forming the façade, a circumstance not attended to by every one, because generally overlooked by those who give us classical porticos far more scrupulously literal than need be in regard to columniation, yet having internally comparatively small doors, if not windows also. In the antique style the dressings of doorways are very simple compositions, however elaborately their details may be enriched; in nearly all cases alike, the architrave mouldings forming the jamb of the door bear a standard fixed proportion to the width of the aperture or door itself, which last generally fills up the entire opening, except where what answers to a modern fanlight is left between the door and the lintel of the doorway, as in the Temple of Vesta at Tivoli, that of Hercules at Cora and the Pantheon at Rome, in all which that space was filled in with open or lattice-work in metal, for the admission of air and light, whereby a door and window over it were united into one composition. The two last-mentioned examples are further remarkable, as instancing the mode resorted to for enlarging the doorway to the proportions

required by the rest of the design without increasing the aperture in the same degree, namely, by filling up the space between the architrave dressings and the door by antæ or pilasters. In Gothic architecture similar contraction of the aperture of doorways was practised, or, as it may more properly be termed in that style, any requisite degree of extension could be given to the general framing of a doorway by merely increasing the depth of the splay within which the door was placed, and the number of the shafts or other mouldings enclosing the opening; by this means, what would else have been a comparatively insignificant feature was rendered an important and highly ornamental one. Even in the most magnificent portals and in the façades of the largest structures in the Gothic or Pointed style, the doors themselves are usually of moderate size, and the aperture is besides frequently divided into two by a central pillar or shaft; whereas very spacious and lofty doors would have been attended with the inconvenience of exposing the interior too much whenever they were opened. Little judgment, therefore, and not much more knowledge of the style itself was shown in making the entrance doors of Fonthill Abbey of the preposterous height of 30 feet, dimensions that would have been lofty to excess even for a gateway, except such a one as the beautiful Erpingham Gate at Norwich.

Wood in Brickwork.

It is generally held that nothing but its own components should be admitted into a brick wall, except what is absolutely necessary for its connection with the other parts of a building, such as wall-plates and wood bricks (and that these should be avoided as much as possible), templates, lintels, &c. Wall-plates are required to receive the ends of the joists, and distribute the weight of the floor to which they belong equally along the walls. If the joists tailed singly on the naked bricks, their thin edges would crush those immediately under them, and the rest of the brickwork would escape immediate pressure altogether. Wall-plates may be superseded by the use of templates; but this involves the necessity of framed floors, which are carried by a few large beams, under whose ends stout pieces of timber 3 or 4 feet in length are placed. These are intended, like a wall-plate, to distribute the weight over a considerable part of the wall, and prevent the necessity of placing the beam on the naked friable bricks, and are called templates. Lintels are used over square-headed windows and doors instead of arches in brickwork. They are useful to preserve the square form and receive the joiner's fittings, but they should always have discharging arches over them, and should not tail into the wall at either end more than a few inches, that the discharging arch be not wider than is absolutely necessary. If, however, discharging arches be not turned over them, the lintels should tail in at each end considerably, and have small templates or wood bricks placed transversely under them. They may generally be quadrants of a circle, or even flatter, and should be turned in two or more half bricks over doors and windows, and other wide openings, but over the ends of beams they need not be in more than one half brick.

Salisbury Cathedral.

The uniformity of style in the interior of Salisbury Cathedral, it is admitted, adds greatly to the fine effect of the exterior appearance, yet it has been remarked that the interior of this church is neither so grand, picturesque nor diversified as that of many other cathedrals. Time, by its slow and irresistible progress, has imparted to the edifice that sombre hue of antiquity which makes the old age of buildings the period of their greatest beauty. Revolutions, political and religious, have stripped the church of its sculpture and paintings; but fashion has within these walls done more mischief than revolution, and in the assumed names of taste and improvement has destroyed part of the original plan, and by a capricious change in the sites of its ancient monuments has despoiled the cathedral of some of its greatest ornaments. One of the principal alterations made under the direction of Bishop Barrington in 1789, by James Wyatt, was the opening of the lady chapel to the choir by the removal of the ancient altar and its screen, taking it for granted that the professors of architecture in the reign of Henry III. must have had false ideas of proportion, the lady chapel being then universally kept distinct from the choir. This supposed improvement could not, however, be completed without also removing two chapels, one on the northern side, erected by Bishop Beauchamp, and one on the southern side by Lady Hungerford, both built in the fifteenth century. It was at the same time necessary to alter the level of the pavement, when several stone coffins, with perfect skeletons, were disinterred, supposed to belong to the early benefactors of the church. Many of the ancient monuments were removed, and were ranged between the clustered pillars in the nave; two porches were taken down and the openings closed up. There is but one opinion respecting the desecration which was then called improvement.

NOTES AND COMMENTS.

ALTHOUGH the Marquis of BUTE has, since he attained his majority, given commissions to a larger number of architects than most peers, happily only one instance has occurred in which the aid of the law courts was invoked respecting fees. The exception came before the court of session in Edinburgh, and strictly speaking his lordship could not be considered as a defendant. The plaintiff was the representative of the late JOHN RUSSELL WALKER, an Edinburgh architect, who died in July 1891. In 1890, the Marquis of BUTE asked Mr. WALKER to prepare a design for a large Roman Catholic church to be built in Dunfermline. The plans were prepared and were approved by the Archbishop of Edinburgh, and by the priest at Dunfermline. The Marquis of BUTE, however, explained to Mr. WALKER that the selection of the plans did not lie with him, and that his object in having a sketch plan prepared was to assist him in laying his ideas before the church authorities. His lordship did not deny liability for the work, but said that it was only after the raising of the action that the plans were produced, and he was therefore unable to make any offer for the work done. The action was not allowed to proceed as a liberal sum was given in settlement.

IN the windows of the chancel in the cathedral of St. Stephen, Vienna, a large number of fragments of stained-glass can be seen. They are derived from other windows, and form as curious a medley as exists in the world. At a distance the effect might be considered kaleidoscopic, only there is no such symmetry as the toy displays. When examined closely, the windows present a sort of topsy-turveydom such as some lunatic glass painter might see in his dreams. For a long time past it has been felt that the fragments are out of place near the high altar of so noble a church, and resolutions about their removal were made by the cathedral authorities and approved by the Government. Orders were given long ago for painted glass to fill the windows, and the erection of it could be commenced immediately. But what is to become of the ancient fragments? There are many amateurs who would compete for the possession of the smallest piece, for the colours have become beautiful. As the glass is considered national property, that sort of disposal would not be satisfactory to the Austrians. To set up the collection of pieces in one of the museums of the city would be to repeat the impropriety which has given offence in the cathedral, and the various curators appear to have opposed the proposition. It is likely therefore that the glass will find a refuge in some provincial museum.

THE annual meeting of the Province of Quebec Association of Architects has been held at Montreal, when the following officers were elected:—President, J. BAILLARGE, Quebec; first vice-president, A. C. HUTCHESON; second vice-president, A. T. TAYLOR, Montreal; secretary, JOSEPH VENNE, Montreal; treasurer, JOSEPH PERRAULT, Montreal; auditors, W. MCLEA WALBANK and J. Z. RESTHER; council, A. F. DUNLOP, Montreal; F. X. BERLINGUET, Quebec; JAMES NELSON, Montreal; A. RAZA, Montreal; J. E. Z. GAUTHIER, Montreal; O. B. BERTRAND, Montreal. A framed photograph of the forty-two Montreal members was presented to each of the members from Quebec, in return for a similar courtesy. Afterwards there was a conversation in the rooms of the Art Association, in which about one hundred and thirty architectural drawings were exhibited.

THE London County Council having had under consideration the provision that should be made for washing and drying the tenants' clothes on the Boundary Street area, Bethnal Green, have approved of the plan of a central laundry, to which will be added four baths for women and twelve for men; the charge to be, for a cold bath one penny, and for a hot bath twopence. The public health and housing committee, in recommending this plan, considered it to be superior to the practice commonly adopted in "artisans' dwellings" of providing wash-houses, either on each floor of the tenements, or on the roof, a practice which often involves the unhealthy and incon-

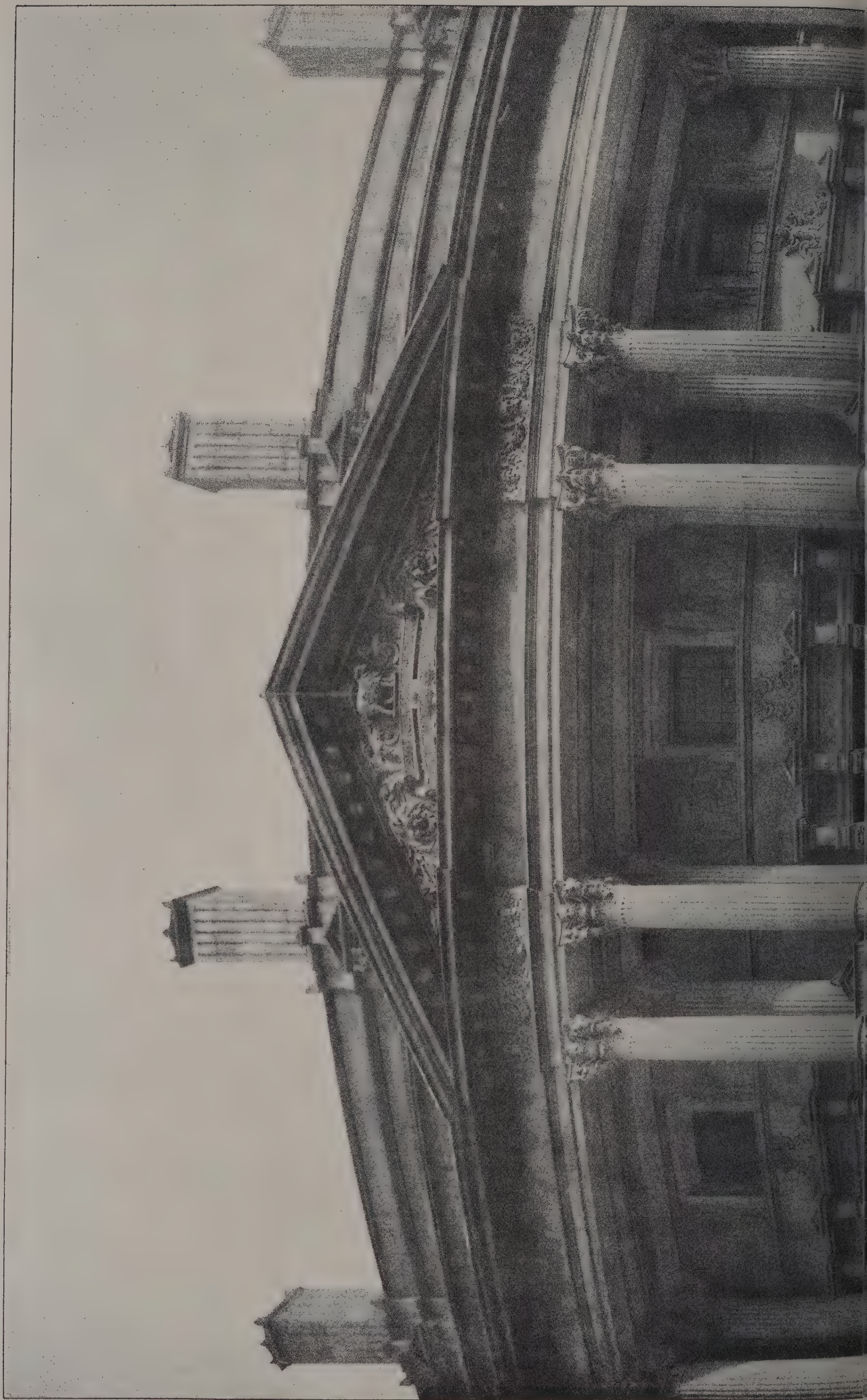
venient necessity of clothes-drying in the tenants' rooms. The Council's architect has submitted a plan which provides forty-two washing stalls, with all necessary accommodation, and appliances for wringing, drying, mangling, ironing, &c. The estimated cost on capital expenditure is 7,250*l.*, the annual charge in respect thereof, including sinking fund, being about 234*l.* The estimated outgoings in maintenance, &c., are 1,313*l.*, total, 1,547*l.*; the estimated receipts being 1,154*l.* An estimated annual deficit of some 393*l.* is anticipated—a sum equal to $\frac{3}{4}$ *d.* per week per room in the buildings. It is calculated, however, that by abandoning the laundries in the buildings an annual saving equivalent to 1*l.* 4*d.* per week per room will be effected, viz. 700*l.*, the interest on 13,125*l.*, the estimated capital outlay.

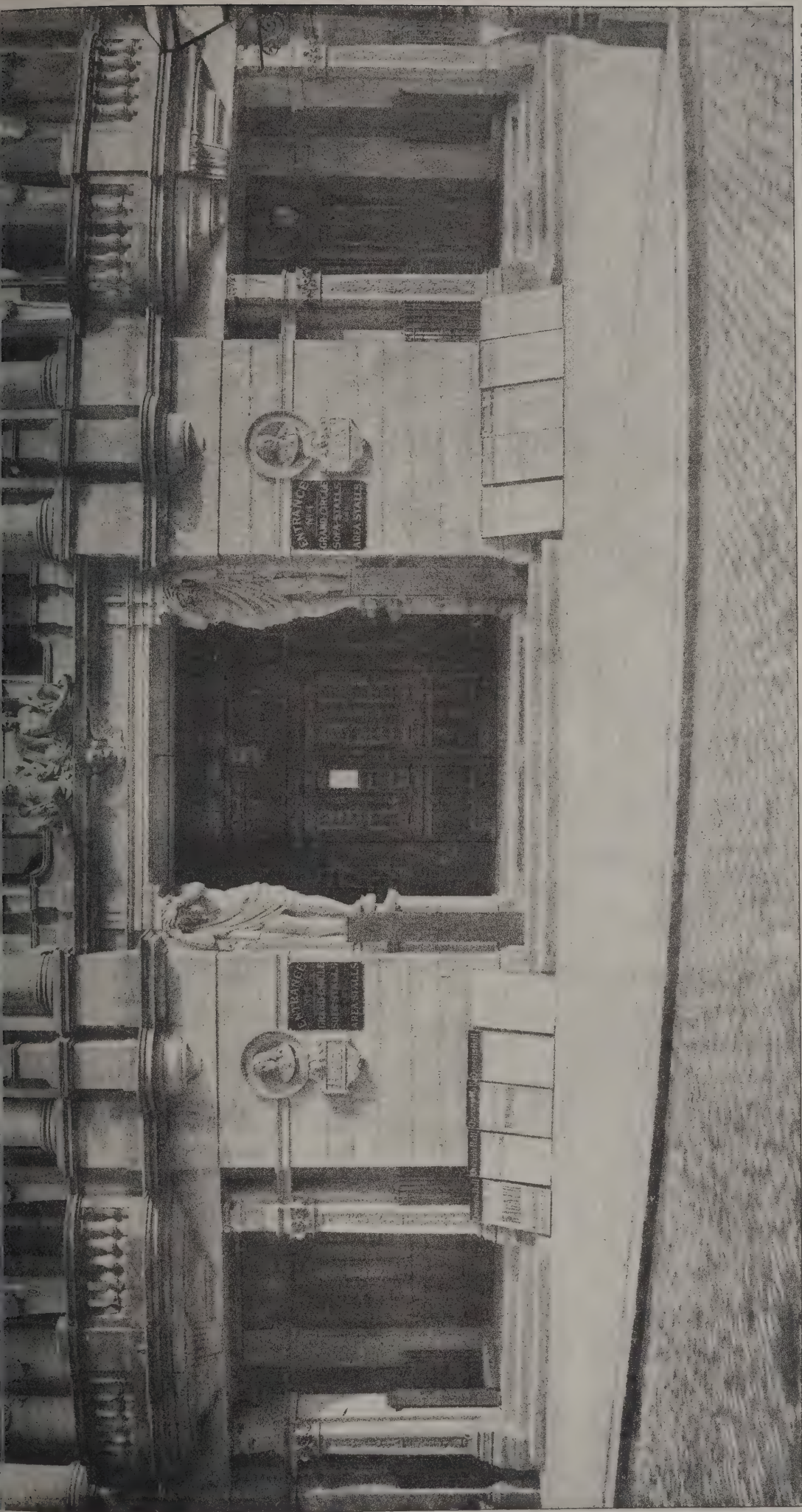
THE Paris Chambre Correctionnelle and M. BIDAULT DE L'ISLE have made short work of the charge brought against M. ALFRED STEVENS, the Belgian painter, by a picture dealer. M. STEVENS, like many painters, accepted some advances on account of his works. Dealers are generally over-anxious to press money on artists, because they hope in that way to secure pictures which might be carried off by rivals. In this case the dealer obtained a lien on the pictures in such a form that the painter was supposed to be "the man in charge." Afterwards the dealer wished to have another custodian, but M. STEVENS stated that, acting on his rights, he had disposed of the works. The dealer therefore issued his summons for breach of confidence. The tribunal declared that the process was unnecessary as there was no breach, since the accounts between the parties were never properly made out. The counter-claim by the painter for damages arising out of such a charge was afterwards heard, and the dealer was fined 500 francs, which, we suppose, was as much as the tribunal could impose.

A MEMORIAL of JACQUES-FELIX DUBAN, the architect, has been set up in the vestibule of the theatre which contains DELAROCHE'S painting of the great artists of Europe in the Ecole des Beaux-Arts, Paris. It consists of a pedestal of white marble, designed by M. BERNIER, and a bronze bust, sculptured by M. EUGÈNE GUILLAUME. There is especial appropriateness in having a memorial of DUBAN in the school, for he was associated with the buildings during his whole career as an architect. Soon after his return from Italy, in which he studied as a winner of the Prix de Rome, he was appointed about 1830 as inspector on the works of the school. From 1832 he was the architect. It was under his direction the covered court, the theatre, the library, &c., were constructed. In 1858 he began the works on the part facing the Quai, including the Salle Melpomène. To his ability the school owes the remarkable attractiveness of its numerous buildings, and it was fitting that future generations of students should be able to realise the appearance of an artist who was so thoughtful about their Alma Mater.

THERE is a remarkable difference in the zeal for church building and restoration between the two archdeacons of the diocese of Chichester. It was found from returns from the churchwardens presented on Wednesday, that in the Chichester archdeaconry during 1892, 854*l.* 6*s.* was expended on the building or restoration of churches, mission chapels, parsonages, churchyards and endowments; and that in 1893 the sum so spent was 5,952*l.* 9*s.* The returns furnished by the clergy, however, made out that the sum raised for the above purposes in 1892 was 7,790*l.*, and in 1893, 3,717*l.* During fourteen years the expenditure was 128,378*l.* In the archdeaconry of Lewes the sums expended in 1892 were as follows:—Restoring churches, 18,583*l.* 12*s.* 2*d.*; mission rooms, 1,736*l.* 8*s.* 10*d.*; churchyards, 452*l.* 9*s.* 11*d.*; parsonages, 1,608*l.* 2*s.* 11*d.*; endowments, 2,551*l.* 1*s.* 6*d.*; total, 24,931*l.* 15*s.* 4*d.* In 1893 the following sums were expended:—Restoring churches, 21,213*l.* 0*s.* 7*d.*; new chapels of ease, 7,234*l.*; mission-rooms, 1,563*l.* 3*s.* 5*d.*; churchyards, 673*l.* 10*s.*; parsonages, 6,516*l.* 4*s.* 7*d.*; endowments, 1,939*l.* 14*s.* 10*d.*; total, 39,139*l.* 13*s.* 5*d.* The fourteen years' expenditure in this archdeaconry amounted to 670,306*l.* The Lewes division is probably the wealthiest, but the contrast with Chichester is, none the less, most remarkable.

The Architect, Oct. 26th 1894.





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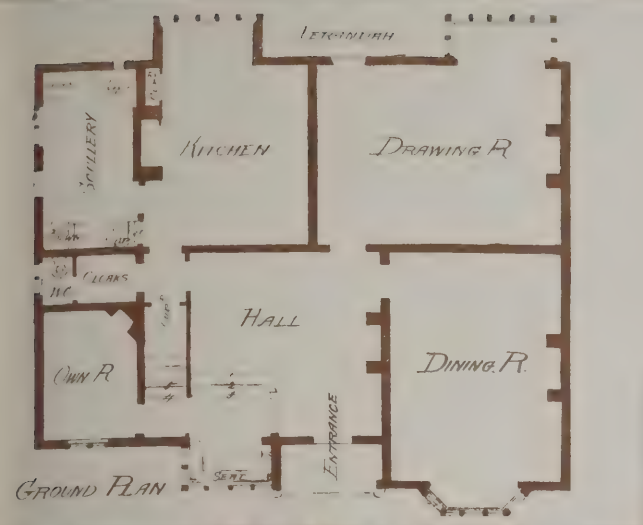
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QUEEN'S HALL, LANGHAM PLACE: DOORWAY.
T. E. KNIGHTLEY, Architect.



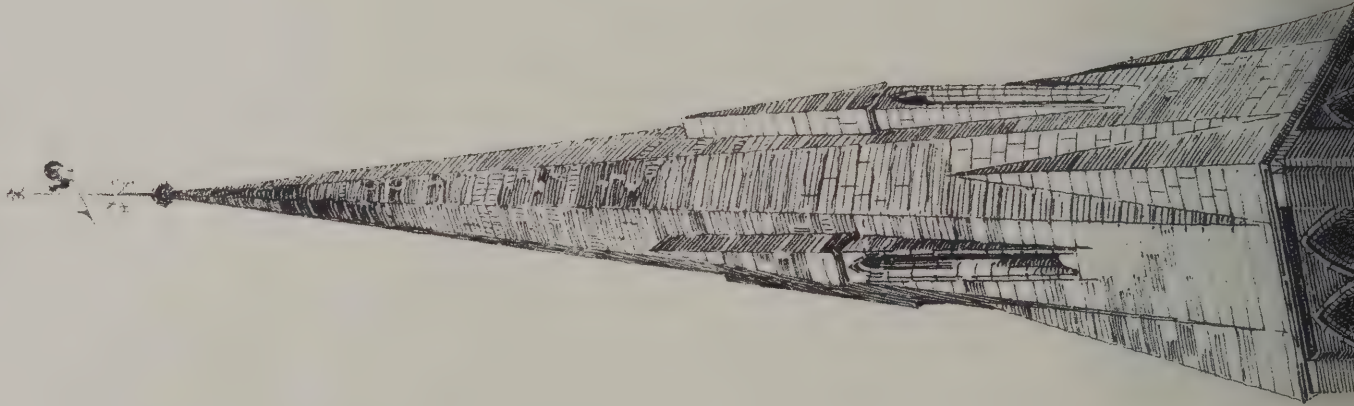
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A STREET FRONT
G. O. SCORER, Architect.



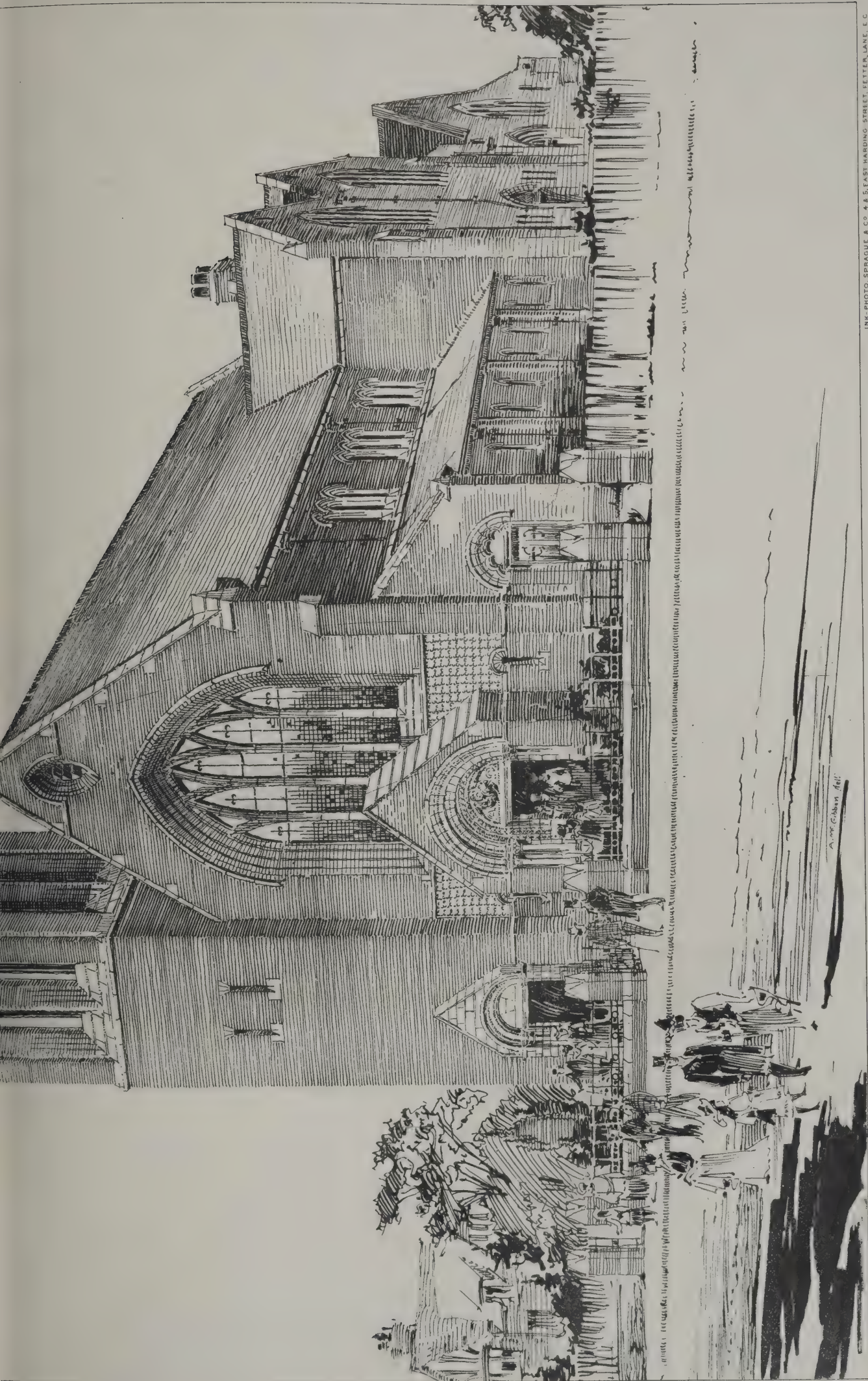
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HOUSE AT BLACKHEATH.
P. MORLEY HORDER, Architect.



Freelands Road
Ground Plan





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PRESBYTERIAN CHURCH, BROMLEY, KENT.
J. MURRAY, Architect.

ILLUSTRATIONS.

QUEEN'S HALL, LANGHAM PLACE.—DOORWAY.

PRESBYTERIAN CHURCH OF ENGLAND, BROMLEY, KENT.

THESE buildings now in course of erection on the east side of Freeland Road, near the junction of Upper Park Road, occupy a site 150 feet deep by 70 feet frontage, and when finished will form one of the most convenient and complete blocks of buildings recently erected for the Presbyterian Church of England. The buildings include a church, lecture-hall, vestry, classrooms, &c., and have been admirably planned and arranged to meet the varied requirements of church work. The plan of the church is cruciform and consists of nave, aisles and transepts, with seating for over 700 worshippers—547 in the area and 174 in the galleries, which are in the transepts and at the west end of nave. The choir and organ are in the north transept gallery. Immediately in rear of the church is a lecture-hall, to hold about 240, and so arranged that it may easily be divided by folding partitions into separate classrooms for Sunday-school purposes. There are also on the ground floor a session house, vestry and lavatories, and on the first floor a large classroom and a ladies' or "Dorcas" room with lavatory attached. In the basement are a kitchen and heating-chamber. The whole of the exterior walls and the interior of the church are faced with red brick with Douling stone dressings. The roof has steel principals and purlins and is covered with green slates, and the woodwork of the interior is of pitch pine. Solid wood-block flooring throughout the ground floor for church, hall and passages. The spire measures 118 feet from ground to vane. Mr. JOHN C. T. MURRAY, of 13 Queen Anne's Gate, Westminster, is the architect, and the work is being carried out by Mr. JOHN BENTLEY, contractor, Waltham Abbey, Mr. GEORGE BARBER acting as clerk of works. The system of heating is by Messrs. MUSGRAVE & Co., of London and Belfast.

A STREET FRONT.

THIS illustration is reproduced from the drawing by Mr. SCORER, which was exhibited this year at the Royal Academy.

HOUSE AT BLACKHEATH.

THE ACADEMY AT ATHENS.*

THERE are few modern structures which possess greater interest for the student of Classic architecture than the academy at Athens, for it is a building constructed of marble from the same quarries as the Parthenon, and enriched with decorations in polychrome carefully studied from the examples of the best period, which lay close at hand. It is from this building, therefore, if from any standing at the present time, that we must judge of the effect of the Greek temple in its perfection, with its white surfaces and brilliant decorations in red, blue and gold. For no one can doubt, in view of the recent discoveries, that the Greeks used colour with a lavish hand on both sculpture and architecture.

The academy and university with the library, which is under construction at the present time, form a group of the finest buildings in the modern city, and occupy a block bounded on the front by the university and on the rear by the academy boulevards, two of the most important thoroughfares. The university occupies the centre, standing on the axis of a street at right angles to the boulevard, but except so far as position is concerned, the academy is much the finest building. It stands well back and slightly above the road. The approach from either side is by a broad driveway from the front by a flight of marble steps flanked by statues of Plato and Socrates by Drosos, a Greek sculptor, who executed all the important sculpture of the building. The structure was intended for the home of a body of scholars modelled after the celebrated Institut de France. But as yet the organisation has not materialised, and the modern Greeks thus possess an academy building but no academicians. The academy is one of the many buildings in Athens and elsewhere throughout the king-

dom, among them the museum at Olympia, the cost of which has been defrayed by private individuals, and presented to the Government. It was erected at the expense of the late Baron Sina, a wealthy Greek of Vienna, from the designs by Hansen, a leading architect of the same place, who built in his own city the parliament house, the fine Greek church, and many other important buildings.

The work in Athens was constructed under the immediate direction of Mr. E. Ziller, who received his training as a student in Hansen's office, but has since practised in Athens, and deserves the credit of having been the architect of a large part of the most successful work in the modern city. The exterior of the academy above the basement, which is of yellow limestone, is built of Pentelic marble. The stone, however, has not been selected with the care which was used by the ancients to have it entirely free from veining, for many of the blocks are plainly marked in this way. Probably this would not be noticeable or objectionable were it not for the fact that many of the stones are not laid on the natural bed, which gives the wall surfaces and pilasters a very unrestful appearance. It is hard to understand the reason for this defective construction, for such it surely is, unless there is difficulty in quarrying the stones in the proper way, which is probably the explanation, for we know a large number of the blocks intended for the Parthenon were rejected at various stages of the work; some of them may still be seen at the quarries on Pentelicus, and others in various stages of completion on the Acropolis. There is but one other serious criticism to be made regarding the exterior of the building, namely, that the two isolated columns on either side of the main portico, crowned with the statues of Athena and Apollo, are out of scale with their surroundings. This seems to be a case of misplacing rather than of misconception, for the idea of having these deities prominent in this connection is decidedly happy.

It has been suggested that if the columns were moved forward on a line with the statues flanking the stairway, the effect would be much better.

The pediment groups, except being perhaps a trifle small in scale, are admirable. The one over the main entrance, representing the birth of Athena, is executed in marble, the others are of terra-cotta and coloured. The background of the figures in each case is a strong blue. The detail everywhere has evidently been studied with unusual care, and the carving shows a refinement, delicacy and crispness, all of which are so often lacking in modern work. The beauty of the detail can be well seen in the lamp posts which stand in front of the building, as well as the four candelabra of the main hall inside.

The polychrome decorations of the exterior are doubtless the most interesting feature of the building, red, blue and a generous amount of gold having been used with most successful results. The different members of the entablature are enriched with running patterns, and the capitals and bases of the columns are decorated in gold and colour. The wall surfaces and shafts of columns are left plain except for a rich band of decoration on a background of gold which runs around the building, corresponding in width to the height of the pilaster caps, which are themselves highly coloured, the sunken surfaces being red, while the ornament in relief is picked out in gold. The colour on the exterior has now become somewhat weathered, and the marble has begun to take the delicate yellow tone so pleasing in older work. This result has doubtless been hastened by the washing of the pigments on to the plain stone surfaces; but whatever the cause the whole effect is certainly charming, and leaves one to realise the infinite possibilities in the art of polychromy as applied to out-of-door architecture—a field upon which but a few in our day have dared to venture.

The plan of the building is extremely simple, and is clearly expressed by the external lines. Passing under the columned portico, one enters a square entrance-hall with a flat coffered ceiling and walls of plaster painted to imitate marble—the only sham in the building, but unfortunately in a most conspicuous place. On either side is a corridor leading to the wings, which consist of one large room divided by columns into three sections. In one of these rooms is now kept the valuable collection of coins owned by the Government; the other is not at present open to the public. Directly back of the entrance-hall is the large hall intended to be used for the sittings of the members of the academy. The room is finished in white marble, richly decorated in red, blue and gold. The frescoes, which are much above the usual standard of such work, are series of paintings relating to the myth of Prometheus. The marble statue of Baron Sina, which stands at the end of the hall, is by Drosos. The ceiling, while perhaps not as successful as the remainder of the hall, has the merit at least of showing honest construction, for the lines follow strictly those of the roof.

It was my good fortune during my last visit to Athens to be able to examine closely the cornice and pediment of the Parthenon from a staging erected for a professor of the Ecole des Beaux-Arts. The patterns of the main lines of decoration are

* A description by Mr. Thomas A. Fox, contributed to the *Architectural Review*.

still quite plainly marked in places, and a few traces of colour are still to be seen, although much less apparent than at the time of Mr. Penrose's examination some years ago. Near the top of an internal angle of one of the triglyphs I was able to uncover with the point of a knife a bit of the original blue, almost as bright as pure cobalt. This careful examination of the old work confirmed my opinion that the polychrome decoration of the academy was executed only after careful study, and is so far as possible a correct reproduction of the patterns and colours used on the temples of the best period of Greek art and architecture.

"TARA'S HALLS."

THERE can be little doubt that, owing to the absence of any systematic study of archæology in Ireland during many centuries, the people have been induced by the exaggerations of minstrels and others to imagine that the country was full of palaces. Tara's Halls were easily pictured as a romance in limestone. Some fifty years ago, when fancy was supplanting good sense, George Petrie endeavoured to explain to his countrymen that the only remains of halls on the famous hill were mud banks. The royal festivals which were supposed to surpass all that were enjoyed in other lands were no more than assemblies in the open air. Petrie's investigations were, however, ignored except by a few scholars. It is remarkable that during the period which has elapsed since the publication of his essay on the "History and Antiquities of Tara Hill" nothing has been discovered which would weaken his conclusions. In the *Journal of the Royal Society of Antiquaries* for the present quarter the essay has been employed by the Rev. D. Murphy, S.J., and Mr. T. J. Westropp, M.A., as a guide to the compilation of a description of the earthworks, and they describe it as "a work worthy of the highest praise for patient research and exhaustive treatment," to which they refer students who desire more details. Petrie's essay is only to be obtained in the *Transactions of the Royal Irish Academy*, for his countrymen were no more disposed to patronise a publication of it than of the other writings of the most cautious and careful of modern archæologists. Accordingly it may be useful to give some extracts from the "Notes" in the *Journal* which have been derived from the essay:—

Tara became the chief residence of the Ardrigh, or chief king of Ireland, in the time of Slainge, the first of the Firbolg kings, A.M. 3266, according to the chronology of the Four Masters, and continued to be so until it was abandoned by them A.D. 563. Within that period of 2,530 years there reigned here 142 kings.

Cormac Mac Airt was Ardrigh from A.D. 227 to 266. This monarch's reign is the epoch at which most of the monuments now remaining at Tara were erected. The Four Masters tell us:—"It was Cormac who composed the Teagasc na Riogh, i.e. instruction of the kings, to preserve manners, morals and government in the kingdom. He was an illustrious author in laws, synchronisms and history; for it was he that promulgated law, rule and regulation for each science, and for each covenant according to justice, so that it is his laws that restrained all who adhered to them to the present time. It is this Cormac also that assembled all the chroniclers of Ireland together at Temur, and ordered them to write the chronicles of Ireland in one book. In that book were the coeval exploits and synchronisms of the kings of Ireland with the kings and emperors of the world, and of the kings of the provinces with the monarchs of Ireland."

The last pagan monarch who resided at Tara was Dathi, who, as we learn from the "Leabhar na hUidhri," was killed by lightning at "Sliabh Ealpa," A.D. 428. His body was brought home and buried at Rathcroghan. His successor was Laeghaire, son of Niall of the Nine Hostages, whose reign lasted for thirty years. He was captured by the Leinster men in the battle of Athdara, and "he gave the guarantees of the sun, of the wind, and of the elements, that he would never come against them on their letting him from them. He died the next year at the side of Caisse between Ere and Alba, two hills in Hy Faolain." In the fourth year of his reign St. Patrick came to Ireland. His journey along the Boyne, the lighting of the Easter-fire at Slane, and the lorica or hymn of protection, which he composed on the way to Tara, his appearance before the king, and the king's conversion, are they are not written in the many "Lives" of Ireland's patron saint?

Diarmuid Mac Fergus Ceirbheoil, great grandson of Niall, was Ardrigh from 539 to 558. It was in his reign that the last *feis* was held in Tara. He was the last monarch who had his residence at Tara, as it was abandoned soon after his death in consequence of the curse of St. Ruadhan of Lorrha.

Though it was never after used as a royal residence, the Ardrighs, however, continued to take their title from it till the coming of the Anglo-Normans. In Amergin's time it was apparently a mere range of earthworks, as it is at present, and even then some of its embankments had been demolished.

We will now pass on to the topography of Tara, giving a short account of the history and legend of each monument. Beginning at the extreme north-west corner of the hill, in a thick plantation, we find a group of three forts and a well. The latter still retained to modern times its name of "Tober finn," i.e. the clear well. Near it are two forts side by side.

1. *Rath Grainne*.—This, tradition says, takes its name from Grainne, daughter of King Cormac, whose flight with Diarmuid O'Duinne from Tara is one of our best known legends. It consists of two concentric mounds, the outer one sweeping boldly down the steep slope, and measuring 258 feet in diameter externally; the inner, 66 feet internally.

2. *Rath Caelchon*.—So named from Caelchu, great grandson of the famous Cormac Cas, king of Munster in the third century. He was for a time a hostage at Tara, and seems to have settled in the neighbourhood, for he was ancestor of two families living in Meath before the Norman conquest. He was buried in this rath, probably in the oval mound at the north side of it. This rath measures 230 feet across, and is 5½ to 7 feet in height, and has an entrance ridge across the moat to the south-west.

3. *Fothach Rath Gruinne, the Seat of Rath Grainne*.—It is amongst the trees, south of Rath Grainne. It measures 157 feet across, and 102 feet on the inside.

4. *Teach Míodchuarta, i.e. the Hall of Assembly*.—It is also called "teach na laech," the heroes' house; "long na laech," the heroes' dwelling; "barc na mban," the women's ship. It is now represented by two parallel mounds along the slope of the hill, so placed, perhaps, to raise the king and nobles at the southern end above the crowd. It is 759 feet long, and 90 feet wide externally and 45 feet internally. It had seven doors at each side. An ancient poem says it was only 300 feet long, so it may have had three sections—a central hall of that length, and portions cut off at either end where the men and the women dwelt. Our ancient books enable us to form a vivid picture of this building in its palmy days. The long room stretched down the slope for 300 feet; along each side were double rows of seats and tables, while in the middle space stood vats of liquor, lamps and huge fires, at which were numerous attendants cooking. We actually possess a little ancient sketch of one of these standing open-mouthed, with the meat on a spit. Every person had a portion of meat according to his rank, the claims being strictly regulated. Some, at any rate, of the drinking-vessels were of gold and silver, enriched with red stones or perhaps enamel. At the southern and highest end sat the king and chiefs. Cormac Ulfada, who was Ardrigh A.D. 213, is described with his long, slightly-curved fair hair. He was clad in a white tunic, with a full collar embroidered with gold; over this a crimson cloak, with jewelled clasps and a gold torque. He bore a red buckler with silver clasps and golden figures of animals and stars. Lower down sat the other courtiers, bards, doctors, historians, "druids or augurs," down to the rabble of 150 cooks, waiters, jugglers, jesters and door-keepers. There was, doubtless, abundance of barbaric splendour in personal adornment, lavish if rude hospitality, noisy mirth and the more intellectual pleasures of music, song, recitations and chess.

5. *Dall and Dorcha*.—These were two small mounds south-west of the hall; but which is which no one can now determine.

6. *Pupail Adamnain, i.e. Adamnan's Tent*.—This rath is faintly discernible in the graveyard which, with Tara Church, occupies its site. Adamnan's cross still remains: a panelled shaft of red sandstone, 6 feet high and 1 foot 6 inches broad. On it appears a rude figure resembling those called Sheela-nagigs. Two curious old stones, 2 feet 6 inches high, attributed to the "giants of Tara," are, with another now lost, the monuments of the Druids Mall (to the east), Bloc (to the south), and Bluicni (to the north). Tradition says they were erected by Mall, king of Emania, A.D. 130; and Mac Firbis tells a marvellous story of the stones of Bloc and Bluicni drawing apart to let pass the chariot of a true candidate to the crown of Tara, while the other sacred stone, Lia Fail, thundered in honour of his coming. The modern church possesses a very fine ancient window removed from the older one. Near this building, on clearing away a bank in 1810, were found two noble gold torques, one being 5 feet 7 inches long, with four perfect spiral bands, now to be seen in the Royal Irish Academy collection of the National Museum, Kildare Street.

7. *Teach Mariseo, i.e. Mariseo's Houses*.—This was a fort to the south of the church, and near a mound called the Sidh. From it spread the houses of the town of Tara down the eastern slope of the hill. Mariseo was a lady of great beauty who lived in the time of King Cormac.

8. *Rath na Riogh, i.e. the Kings' Rath*; called also Cathair Crofinn, i.e. the enclosure of the white house.—This is the most important of the monuments of Tara, and, traditionally, the oldest monument on the hill. It is a huge irregular oval, 853 feet north-west and south-east, consisting of a ditch 4 feet deep and a rampart 6 feet high. Within its enclosure are two forts and two mounds, viz.:—

9. *Teach Cormaic, i.e. Cormac's House*, a rath with an outer ring, said to have been constructed by King Cormac; and

10. *Forradh, i.e. the Place of Meeting*.—An earthwork, like the last, but being in the centre of the great enclosure, it is perhaps older. It is 88 feet across inside, 132 feet externally, 216 feet over all east and west, and 296 feet north and south. At the central point of juncture of its outer fosse with that of Teach Cormaic, Tea is said to have been buried. It is at present crowned with the Lia Fail.

11. *Lia Fail, i.e. the Stone of Destiny*.—This is a pillar of granular limestone, not of the kind usually occurring in the neighbourhood. It was removed from the Mound of Hostages, and put over the "Croppies' grave," some of the insurgents of '98 having been buried in the Forradh. It is 5 feet 3 inches high, and is said to be 6 feet under ground.

This stone was brought to Ireland by the Tuatha de Danaan, the fourth colony, which came to Ireland A.M. 3303, according to the "Annals of the Four Masters;" other authors say by the Milesians. It was called the Lia Fail, according to Keating, because a very ancient prophecy foretold that in whatever country this stone was preserved a prince of the family of Milesius should rule. Ossian, in a colloquy with Dermot, describes the qualities of the Lia Fail. "Any one of all Ireland on whom an *ex parte* statement rested was set upon that stone, and if the truth were in him he would turn pink and white; but if otherwise, a black spot would appear in some conspicuous place on him. Moreover, when Ireland's monarch stepped on to it, the stone would cry out under him, and her three arch-waves boom in answer, as the wave of Cleena, the wave of Ballintoy and the wave of Lough Rury. When a provincial king went on it, the flag would rumble under him." According to Petrie, the stone now standing on Tara is the identical Lia Fail. This, however, is denied by Keating and others.* They say that when Fergus, the son of Erc, passed over into Scotland with a colony of the Dalriada and settled there A.D. 570, he wished to be crowned on this stone. He sent messengers to his brother Murrough, then king of Ireland, asking that the stone should be sent to him, to make his coronation the more solemn. It was preserved with great veneration in the abbey at Scone, till Edward I. of England carried it away by violence, and placed it under the coronation chair in Westminster Abbey, where it now is. Whatever be the fact, Petrie's assertion that no Irish authority earlier than Keating can be produced in favour of this belief is not quite correct; for in the Agallamh na Senorach, *i.e.* the Colloquy of the Ancients, after Ossian had described the qualities of the Lia Fail, as above, Dermot Mac Ceirbheoil asks him, "And who was it that lifted that flag, or that carried it away out of Ireland?" Ossian replies, "It was a youth (oglaech) of a great spirit that ruled over..." Unfortunately the rest of this piece is lost.

12. *Dumha na Bo, i.e. the Cow's Mound*; called also Glas Temhrach, from Glas, the famous mythic cow of the Tuatha de Danaan smith Gaibhnion,† and

13. *Dumha na Ngiall, i.e. the Mound of the Hostages*, traditionally the basement of the house given by King Cormac to the hostages brought to him from all Ireland, are two small mounds north of the forts within the enclosure of Rath na Riogh, the latter being some 13 feet high. The hollow from which the pillar was removed is apparent on its summit.

14. *Rath Laoghaire, i.e. Laoghaire's Rath*.—South of Rath na Riogh, on tolerably level ground, under the first slope of the hill, will be found the western rampart and faint traces of the fosse of a large circular fort, 428 feet to 462 feet across. This was the fort of King Laoghaire, son of Niall of the Nine Hostages and contemporary of St. Patrick. We need not here tell for the thousandth time their meeting on that great Easter morning, but will only remark that Laoghaire, despite the teaching of his saintly guest, retained certain deeply-rooted traces of paganism. He swore by the wind and sun, and broke his oath, believing the oracle that he would die only "between Scotland and Erin: and between two hills called Alba and Eri he died, struck down, people said, by the outraged elements;" a victim to the prophecy "that kept the word of promise to his ear and broke it to his hope." As he had desired, in accordance with the teaching of his pagan father, the great Niall, he was buried upright in his armour looking towards his foes the Lagenians (as Tirechan says), "till the day called Erdath among the Magi, the day of the judgment of the Lord."

15. *Rath na Seanaid, i.e. Rath of the Synods*.—This was situated immediately to the north of the Lia Fail and the

Mound of Hostages; near it were the remains of Pupail Adamnain. The age of this rath is evidently anterior to the events of which it was the theatre, and from which it got the name which it now bears; its original name is forgotten. The synods held here were that of St. Patrick, that of Ruadan and Brendan, and the synod in which Adamnan had the law passed setting women free from the obligation of going into battle; the date of this last synod was probably 694. Adamnan was the well-known biographer of St. Columba. Another synod was held at Tara by the Hy Neill and the Lagenians under the presidency of Dublettir in 771.

16. *Rath Maeve*.—It lies about a mile south of Tara. It is a large circular earthwork without any ditch, 673 feet in diameter. Maeve, from whom it has its name, was wife of Art Aoinfir, who was Ardrigh A.D. 186 to 216; others say it was named from Cormac's daughter.

THE DOLMENS AND MENHIRS OF CARNAC.

IN the *Scotsman* of the 10th inst. is an important description of the ancient stones at Carnac, contributed by Dr. James MacGregor, and which was written by him at the place. It accordingly suggests the impressions which are made on the mind of a visitor more clearly than many of the essays on the subject which were produced under other conditions. The doctor writes:—

Menhir is a Breton word, meaning "tall stone." From the mouth of the Breton peasant it has passed into the language of science as an accurate description of very remarkable monuments known to him and to his fathers, and now known to the whole world as the menhirs, or standing stones of Carnac, from which, at the nearest point, they are distant exactly half a mile. Carnac means the place of the cairn, the Breton cairn being pronounced exactly in the same way as our Celtic word cairn, which may probably mean, as the Breton word does, the place of bones. The vast cairn or mound to which the quaint little town or village owes its name is fifteen minutes to the north-east, and is by far the most conspicuous feature in the surrounding landscape. It is the Mont St. Michel, a high, natural mound, topped by a vast, oblong stone tumulus 88 yards in length and 66 feet high—large enough to allow of a little chapel on its summit, and ample room to spare. Beside it is a granite cross with the scene of the Crucifixion and its figures carved upon it, and hence known as a Calvary. In 1862 the indefatigable Société Polymathique of the Morbihan discovered a large dolmen within it. Our countryman, James Miln, whose memory is here so profoundly and justly revered, in 1875 discovered within it what is more interesting to us, traces of an ancient structure built by the Britons who emigrated in large numbers here after the Saxon invasion. It is understood that extensive excavations are to be made in it next year by the Government.

Our first visit on arriving at Carnac was to Mont St. Michel. There at our feet are the long lines of Carnac, looking for all the world like a narrow cemetery, or series of cemeteries, thickly crowded with grey stones and stretching across country to the north-east, up a gently-rising ground a distance of well over three miles. The line is broken here and there by pine woods. The whole long stretch is called the lines of Carnac. These lines are not now, and never were, absolutely continuous. They are, and probably always were, in three sections, now named after the farms or groups of houses on whose ground they stand. The westernmost, nearest Carnac and the sea, and also the largest, are the lines of Menec; the next on higher ground are the lines of Kermario; the third and the highest are the lines of Kerlescan. "Ker" is a common word here, and means village. We approach them by the high road, which cuts the lines of Menec in two. What do we see? Eleven lines of menhirs or standing stones, the lines fairly straight and fairly parallel, the width of the avenue between them being from 16 to 25 feet. The stones are rough, unshapely, utterly irregular in height and form, steadily increasing in size towards the west from 3 feet to 11 feet in height. One stone taken at random was 20 feet round. The distance between the stones in the same line when left in their original position averages 14 feet. They are all grey granite, weather-beaten, lichen-covered to the north, and clean on the south where the sun strikes them. Although the lines are broken and great gaps occur between the stones in the lines, the regularity is, on the whole, remarkable. The ground inside them here and there bears marks of recent cultivation, and is covered with a low scrub of heather, whins and grass, which is regularly cut by the peasants and kept well down, so that one can walk with comfort all over the ground. At the western end there are ample remains of the cromlech which ended the Menec lines. It formed a complete semicircle, something in the shape of a well-bent bow, the string cutting the lines at right angles and the bow towards the sea. The stones, of which many remain, are of a smaller size than those on the lines and are joined close together. There is every reason to

* In poems by Kineth O'Hartigan and by Cuan O'Lochain, in the tenth century, as well as in the account of Amergin, the Lia Fail is stated, on their own knowledge, to be then at Tara. Kineth says it was "under his two heels" as he composed. This, and the fact that the Westminster stone is held to be of Scotch origin by competent geologists, bears heavily against the tradition of Fergus.

† It has been demolished since 1840.

believe that the cromlech was a place of worship—the temple, to which the lines were the avenues. There are 1,035 standing stones in Menec and 187 in Little Menec close by. A pine-wood divides Menec from the higher ground of Kermario. Here again there is a large farm steading and a dolmen. At the west end of Menec you look out on the sea. At the west end of Kermario you reach the summit of the rising ground, and but for the pine-wood would look down upon Menec and the sea together. There was a purpose in the stones ending just there. The lines at Kermario are ten in number, and rather further apart than at Menec, and the stones, of which 773 are standing, all over, and especially to the west, much larger, much closer together than at Menec. There are more of them in a given area. I have seen Stonehenge, and the stones of Kermario seem to be much of the same size. I have been at pains to measure them, as I could get no authentic information anywhere, and found that the first four stones in the fourth line averaged 11 feet 2 inches in height and 23½ feet in girth. Another stone was 13 feet 4 inches in height and 22 feet 2 inches in girth. Carefully measured, the average distance between the stones in line varied from 12 to 16½ feet, and the breadth of the avenues or distance between the lines from 21 to 36 feet. Like those of Menec they decrease in size towards the east.

Here, as at Menec, there is evidence of a cromlech having existed at the seaward end. The ground slopes gently down and then rises rapidly towards the east. At the highest point there is an old strongly-built tower now in ruins. Let us sit here in the sunshine for a little. You have nearly a mile of the monuments within your eye. As you sit and ponder the inexplicable mystery of the whole thing amazes you. What can they mean these long lines of stones, looking like long winding columns of an army, with sad gaps among them, marching up the one slope in a waving line and in a straight line down the other? There to the east you lose sight of the columns in the hollow, where you see only the tops of the trees, but your eye catches them on the rising ground beyond, rather thinned in numbers, but steadily, century after century, plodding on. Here and there you see menhirs taller than the others, looking like the officers in command. On both sides of the slope substantial farmhouses are found within the lines, built of the stones which have been cleared away. On a rising ground to the north rises like an obelisk the princeliest menhir of them all, close by the quadrilateral cromlech of Manio, which, with its sixteen small menhirs joined close together, it seems to guard. It is nearly 20 feet high and 17 feet in girth, and is, I believe, the largest standing stone in Brittany. Standing above the lines, it suggests the idea of the commander-in-chief of the great army below surrounded by his staff. Another pine-wood has to be crossed, and then the lines of Kerlescan with a very pretty country stretching round. Again, the stones, of which 251 are standing, are much larger than those at Menec, and fairly complete at the west end. Some of them are enormous. Here is one block, looking like a natural rock *in situ*, 13 feet high and 28½ feet in girth. Here again at the west the lines are cut at right angles by another line, forming a cromlech. Eighteen of the stones are still standing—five of them close together, as they all were when complete, their faces looking westward to the sea.

I fear I have bored with too many figures such as may read these words. My excuse is this, that it is no more possible to convey any adequate impression of dimension by saying that a stone is large or enormous than by saying it is the size of a piece of chalk. Although I have had, somewhat late, access to the writings of James Miln and others, and all along had access to the rich museum he has left behind, of which the intelligent guardian was Miln's faithful attendant in all his explorations, beyond the height of one stone at Menec and several at Kermario, I have been unable to get any information whatever as to the size or weight of a single menhir at Carnac. The following figures, given me at the museum, even though they differ from guide-books, may be thoroughly relied on. Within a space 3 miles 23 yards long, and, roughly, 120 yards broad, there are standing to-day 2,262 menhirs; 156 are lying among the lines, 272 are lying in walls, 200 are broken in fragments, making 2,890 in all. To these must be added 610 more in the adjoining country. At Erdesen, a few miles away, standing, fallen and broken, there are 1,200, and at St Barbe 30, giving for the district 4,730. Of dolmens there are 55 at Carnac, 256 in the Morbihan and in Brittany nearly 500. These are only the poor remains which the ravages of time have left. There is reason for believing that on the ground to which we have alluded there have stood as many as from 12,000 to 15,000 menhirs. I have heard it said, by one who knew what he was talking about, that as many as 15,000 menhirs were gathered in Brittany, and employed in building the Fort of Quiberon. Successive generations of men have made them convenient quarries. You cannot walk to-day along the admirable roads with which the country is covered, and in among the pleasant lanes, without seeing them everywhere in the dykes. Villages have been built out of them. Not only the parish church on which I look as I write, with its

much-admired and hideous baldachino porch, but I am informed on good authority this whole town of Carnac was built out of them. As late as 1626 they numbered as many as 6,000. While so much is irrevocably gone, let us be thankful that so much remains, and, humanly speaking, will remain for ever. Within the last few years, mainly under pressure by Henri Martin and other illustrious Frenchmen, the Government of France, at no small cost, purchased these precious monuments. And now these great lines are all enclosed, and close by every stone or group of stones, it may be a solitary menhir on a lonely moor, there stands a massive block of white granite with the following words cut deep and large upon it, "The property of the State," and then comes the name and description of the monument, whether dolmen or menhir, &c., and then the interesting words, "The law punishes by fine and imprisonment the destroyer and mutilator of monuments."

There are various features about these menhirs which are deserving of notice. Though none of them are mere slabs, there is generally one of the sides more rounded than the other, and it is noticeable that the flatter side is turned toward the central avenue. Many of them are of a pear shape, the narrow end and the broad end being alternately inserted in the earth. They are always near the sea. They always look to the west. The lines always run in a westerly direction and look to the setting sun. The west end is marked, as we have seen, by two important features—the vast size of the stones and by the existence of cromlechs. These cromlechs are quite distinct at Menec and at Kerlescan and they are indicated at Kermario. The long avenues so laboriously constructed clearly lead somewhere, and that somewhere is the cromlech and the sea. Another thing, the dolmens and menhirs here in Morbihan are always found together. They are the work of the same men, memorials of the same time. One has only to look at them to come to some such simple but certain conclusions as these, that some great moral or spiritual force reared them, and that, like Rome, they were not built in a day. As was the case with many of the great cathedrals, we cannot go wrong in thinking that they took centuries in the building. We know what it cost, with all the appliances of modern science, to put the two great Egyptian obelisks where they now stand, on the Thames Embankment in London and in the Place de la Concorde in Paris. The menhir of Locmariaker alone was a heavier stone than either, and it was only the largest of many like it. How raised by our rude forefathers we do not know, and probably never shall.

There is one explanation as to their origin, the acceptance of which would save us a great deal of trouble. I have pointed out the remarkable resemblance they bear to columns of soldiers on the march. It is this, no doubt, that has given rise to the local tradition which has for ages satisfied, and seems to-day to satisfy, the mind of the Breton peasant. The patron saint of this parish is St. Cornély, and he is one of the most influential saints of Brittany. As the great protector of cattle, he has made this poor parish one of the richest parochial charges in the Catholic Church of France. He was martyred so long ago as the third century. The legend goes that he was one day pursued by Roman soldiers, and had to run for his life. He fled till he could flee no further. The sea was before him, and escape impossible. But St. Cornély was equal to the occasion. He turned round, bravely faced the stout legionaries, and, lifting his hand, turned them in a moment into stouter blocks of granite. One is inclined to agree with M. l'Abbé Mahé, who humorously observes, "This metamorphosis, which rivals those of Ovid, will probably not satisfy the antiquaries; but I am inclined to prefer it to their explanations, because, without being a bit more incredible, it has the advantage of being brighter and more pleasing." To this day the Breton peasant calls these stones, as his father did before him, the soldiers of St. Cornély. Driving in the country one day, we asked our coachman what menhir that was a little way from the road. His reply was, "Oh, that's nothing; that's not a soldier of St. Cornély."

But there is another resemblance which the menhirs bear, and which may lead us nearer the truth, and that is a cemetery. Ossian, though not a member of an archaeological society, was nevertheless a Celt, and a person of very respectable abilities, whose opinions, therefore, are deserving of consideration. If he never saw the Morbihan, he writes as if he did. He knew the dolmens, and he knew that they were Celtic monuments, and he knew the purpose for which they were reared. He describes them as composed of two or four or more stones. "Seest thou that stone which lifts its grey head amongst the grass? There lies the chief of the race of Diarmid. . . . O Carril, dost thou not see the tomb near to the torrent? Three stones lift their grey heads above the oak bent with the wind. Under these stones reposes a chief. Open to his soul the passage of the winds. Open to him his aerial palace. He is the brother of Cathmor. Let thy songs rise to his shade." With regard to the dolmens, Ossian was right. They were unquestionably the graves of the mighty dead. The remains found within them put that out of question. Kings and

chiefs of an ancient race were buried beneath them, not the chiefs merely of the people who hunted and fished and shot round the shores of the Morbihan—they are far too numerous for that—but the chiefs of the Celtic people, far as well as near. The sentiment that prompted the Celtic chiefs of Christian times to have their remains laid to rest in the sacred soil of Iona equally prompted the desire on the part of the great chiefs of pre-Christian times to be buried in the holy land of the Morbihan. We may be quite sure that under each of these ponderous structures there was laid the body of a man famous in his time. When one thinks of the means at their command, a galgal like that at Gavr' Innis or a tumulus like that at Kercado impresses one fully as much as the tomb of the Cid at Burgos, or that magnificent tombeau de Napoleon, with the touching inscription taken from his will, beneath the swelling dome of the Invalides. As in the case of the Pyramids, these old forefathers of our British race built for eternity. Instincts and desires that were not all of earth prompted their erection. As best they could, they expressed and embodied the hope of an imperishable home in imperishable granite. Where the hand of man has let them alone they stand pretty much as they did at the time they were reared, more than two thousand years ago, how many more no one can tell.

Looking with Ossian's eyes, we see that not merely the mighty dolmen, but the solitary menhir, like a gigantic sentinel watching the centuries, marks the place of the dead. More touching still, if we take him for our guide, we may believe that the 12,000 menhirs which stretched their long lines at Carnac either mark the spot where a soldier sleeps or is sacred to the memory of one who fell in the fight. "Rear the tomb," says Ossian, "to all those who have perished in the battle. If all were not reckoned among the chiefs, all at least were brave. No warrior is forgotten by Carril. . . . Let thy bards weep for the slain. Let the stones reared over their tombs attest their renown. In the days to come let the children of the north know the fields where their fathers fought." And finest of all:—"At the opening of the dawn his weary dreams will pass, he will see around him the tombs of a thousand warriors. He will ask, 'What stone is this?' Some old man will answer him, 'It was reared by Ossian, king of a time that is gone.'"

"Se non è vero, è ben trovato"—If it is not true, it ought to be. I like to think that beneath each grey stone in these mysterious lines a warrior once was laid. As I walk along them late of an afternoon, when the red September sun dyes the sea with blood and every tall menhir casting its long shadow on the grass, the mystic sentiment of the place steals over me, and I think I can faintly recall the feelings and the dreams of a people and a time long gone by.

There is stronger proof, however, than Ossian as to the sepulchral purposes of the menhirs. Their Celtic origin is very widely admitted, and there seems no reason whatever to doubt it. It would be a waste of time to give proof of that. The researches of others besides James Miln, who for years occupied the room in which I write these lines, have shown that they were reared before, and probably long before, Roman times. He has discovered and described among the very lines of Carnac works of defence reared by the Celts in times anterior to those of the Romans. Menhirs are found built in the walls of Roman camps. He points to one stone especially which gives proof of having been reared ages before the Romans ever visited Gaul. The local tradition about St. Cornély has probably some truth in it, as ancient traditions generally have, and may point to some destructive battle in the neighbourhood and to the graves which are of great battles the one certain result. But the most solid argument seems to be this. It is certain that in the land where these two classes of monuments principally prevail there is a close relation between the dolmen and the menhir. It is certain that throughout the whole of this region, wherever, as at St. Barbe, at Erdevon and at Carnac, there are lines of menhirs, dolmens will be found, more or less frequently, on either side; that even where a menhir stands alone a dolmen, as a rule, is not far away; that in this region, and this region alone, their orientation is precisely the same; and that, with the exceptions which I have mentioned, both alike are almost entirely free from any mark or sign whatever. Where such similarity exists it is difficult to resist the conclusion that they served a similar purpose, but the evidence for the sepulchral purpose of the dolmen is overwhelming and undisputed. It strengthens the argument to know that the same objects which have been found within the dolmens have been found at the base of the menhirs, and that the Breton names for both indicate a sepulchral purpose. Intense reverence for the dead is to-day, as it has always been, a feature of the Celtic character. In that sentiment we find a power adequate to the erection of these marvellous monuments. But that sentiment has rarely, if ever, existed alone. It is always associated with another, the faith, or the hope, or the dream of a life after death. Neither in Egypt nor in Morbihan were these costly structures reared to cover the remains of a being who was as dead as the stones that covered him. The place of graves becomes the place of worship. These mile-long alleys of

colossal menhirs were not merely lines of tombs. They were avenues that led to and ended in cromlechs, and the cromlechs of Carnac, like that of Stonehenge, were temples for the worship of an unknown God, and probably contained altars of sacrifice to the power which was adored. Of that great power the sun is the most natural and the most splendid symbol. Tradition told these ancient Bretons that through long centuries their race had been driven further and further westward, till here in Brittany, in Cornwall and in Wales they reached a barrier which, though they tried it, they could not cross. They reached the sea. On those level plains of ocean, night by night, they saw the sun go down. Where he went, somewhere far beyond their vision, their dead had gone. There they in turn would go; and so in worship they turned their faces to the sunset, and there in the Morbihan, made sacred by some great deed or some great death, forgotten even by tradition, for ages they laid their dead, where they themselves hoped to lie, close by the Little Sea that opens on the west. These, however, are mere guesses. We must leave these rude, uncouth and uncanny stones among which we have been wandering for twenty days, and whose attraction grows and deepens the longer we see them, with the admission that their origin and their meaning are a mystery; and mystery always has the compensation of charm. More than half the charm would be gone from these ghost-like lines of granite if we could tell their day and date, their why and wherefore. But there is no likelihood that we ever shall. They are voiceless as stars that shone above their builders. They are silent as the graves in which they lie.

THE HISTORY OF ARCHITECTURE.

A LECTURE has been delivered in Rhyl by Mr. J. E. Phythian on "The History of Architecture," in connection with the University Extension Course. He said they were assembled there that evening to consider together the history of architecture. There was no doubt about architecture being a noble art, but it was considered by many to be a dry subject, and when they heard people who were supposed to take a deep interest in lectures speak of the subject of architecture as such, it was evident that there was a great deal of ignorance somewhere. As a matter of fact, with the exception of music the arts had almost been ignored in our English education. While something was done in the way of painting and drawing, the history of arts, like the history of the sciences, had been neglected in England. So much so that they had really lost the use of their eyes. The ordinary Englishman went about in ignorance of the really extreme ugliness of the towns he was residing in. The object of such lectures was to induce people to take an interest in architecture as an art. While they would deal with the architecture of the different periods through which they would pass, he wished it to be understood that there would not be a superfluity of technical matter. What they had to consider was that state of architecture which related to history, which was really the expression of the minds of the different races. They were told by Mr. Ruskin that "architecture is the art which so disposes and adorns the edifices raised by man, for whatever uses, that the sight of them may contribute to his mental health, power and pleasure." There was a great deal more in architecture than in merely getting a building to stand up. That was a great thing, but it was not all. Architecture while based upon it was distinguished from mere building. It also differed from the other fine arts in having a utilitarian side. Every art meant something useful, but from prehistoric times they found that men built places in which they lived and kept their tools, &c. Men as soon as they had a place in which to shelter themselves began to use the other arts in the ornamentation of their dwellings. Architecture accepted help from the other arts, and in turn gave help to them. Architecture had something to do with all the other arts. Even with music it would not have been possible for it to have taken such a hold on the people if it had to be given in the open air. It was when they heard music in an enclosed space, in their cathedrals, churches and large buildings that they had its fullest beauty. Then it was that architecture helped the other arts, guided and gave them shelter. He was not there that evening as an architect to discuss and work out to them whether that building was properly erected and portions of it sufficiently strong for the work it had to carry out. He proposed to deal with the more emotional side of architecture and why they should be invited to take an interest in it. The first thing with any art was, that it could not live unless it was rooted in the popular affection. Mr. John Ruskin told them that the only living art was bill-sticking. That was really true, and if they for one moment considered the question they would admit that it was the one in which the majority of people took an interest. Not only must they have people to draw and practise art, but they must also have people to enjoy it. An artist was really like a

shopkeeper; he must be patronised. But what was the present condition of things? If a person or body of people desired to erect a building, plans were asked for; but if the estimate exceeded the sum they were prepared to spend, the first thing done was to knock off the artistic portions. Unless they all worked together for a common end art could not prosper, and they ought to know the history of the arts in order to take that interest which was necessary. Things had changed from what they were in ages gone by with regard to the duties of the architect. Now the architect merely provides the plans, whereas in the bygone ages he was the head workman, so that there was in all work carried out a certain amount of individualism. Until they got the true and best brain power of each individual in the work carried out, architecture, or even sculpture, could not live again as it had lived in the past. While their architects copied the buildings of ancient Greece, they had not the life and spirit but the mere shell of them. Before they could get at the true value of architecture they had to understand its history, like with painting and music. The lecturer then proceeded to trace, by means of lantern illustrations, the course of architecture from the earliest ages. He said the question of supporting a roof was one that had to be well considered. An illustration of the lintel and Pointed and other arches was thrown on the screen, and their relative merits were explained. He said the lintel would not support a heavy weight, while an arch would, although it was necessary in the latter cases to have side supports. He explained the general form of Egyptian buildings in which the square form was used, the decorations of the tombs and temples. Passing on to Greek architecture, he explained that the Greeks undoubtedly took hints from Egypt, Assyria, Persia, Phœnicia, as it seemed improbable that the Greeks could have again invented or had the same ideas as the other nations. The Greeks carried out details to perfection, and the lintel construction, with ordered decoration. There was with them the expressive side of architecture. The lecturer drew special attention to the Parthenon and the other temples on the Acropolis at Athens. Speaking of the sculpture of ancient Greece, he said that no matter what portion of a figure they looked at, they would find life, so to speak, in it. Passing on to the Roman architecture, the lecturer demonstrated the practicability of the Romans, who had brought out the arch to supplant the lintel, the dome, and the splendid work of their practical genius in the buildings erected by them. With Greece there was perfection in ideas, and the workmen from that country were employed to decorate the great undertakings of the Romans, but they had in the great amphitheatre and triumphant arch at Rome introduced construction for decorative purposes.

ARCHÆOLOGY AND ART.

THE Edinburgh University authorities having recognised classical archaeology as an alternative subject for honours in classics, in his opening address as Professor of Fine Art Professor Baldwin Brown treated of the subject. He reminded his auditors that it was while musing amidst the ruins of the Capitol that Edward Gibbon conceived the idea of writing his great history. The study of classical archaeology needed no better justification than this record afforded. Were it not that these material products were the key to much of the life and power of ancient states; were it not that they could discern therein the spirit of their religion, their policy, their conduct, classical archaeology would be a barren collection of details without connection and without significance. As it was, it was a study pregnant with human interest. Taking only, for the moment, the case of Imperial Rome, there, more perhaps even than in Greece, the material monument was the most characteristic production of the people; and not Gibbon only, but every historian, every scholar, who had taken the Eternal City for his theme, had felt his imagination stirred as much by the sight of the stones of Rome as by the written page of Tacitus or Juvenal. Classical archaeology was the science of the old things of the inhabitants of ancient Greece and Italy. The classical curriculum had all along embraced the treatment from various points of view of the language, literature, history and thought of the Greeks and Romans. The inclusion of this new study implied a recognition of it as a kindred study to those already established; it implied that these material objects were now seen to carry with them a considerable amount of instruction about the lives and thoughts of the great peoples of antiquity. In learning about the monuments, the statues, the household appliances of the Greeks and Romans, they were gaining an insight, not otherwise easily acquired, into their ideals, beliefs and customs. Only so far as this was recognised to be the case with the study in question could it with propriety be received into the curriculum. The second point to note was the fact that this new branch of classical lore fell to be dealt with in the department of fine art; and this signified that these material objects were wholly or in great part of an artistic

character. Dealing with the last point, remark was made more particularly of the household objects found at Pompeii; how, whatever their form, they all bore the artistic stamp. In the case of the ancients generally and also of the men of the Middle Ages, the circumstances for such workmanship were of the most favourable description. All the conditions which favoured good artistic work as applied to objects of use were as conspicuously present in their case as they were absent in the case of the workman of to-day. It was not the fault of the latter that his productions are so commonplace, but rather that of his education and surroundings. The artisan who was supposed to be habitually thinking—not of his task, but of the probable success of the next strike, no doubt existed among them, but there existed too the honest craftsman—one knew and respected him—who would ask for nothing better than the chance of turning out his work touched with a little of the nameless charm of the antique. Had he been an ancient Greek or a Mediæval German he would have done as well as they, but the modern condition of production, with the division of labour, the race for cheapness, the competition with the machine, reduced his efforts to impotence. Hence the contrast, so often lamented, in the matter of artistic interest and beauty, between the works of classical and Mediæval craftsmen and our own much-abused surroundings. Again, if the former were almost always beautiful, they were also significant—eloquent of the modes of thought and action of those who made and used them. They were rooted, indeed, so deeply in ancient life that they became a body of records standing side by side with the records these peoples had left of themselves in literature and tradition. The Professor next illustrated at some length the connection between the religion of the ancients and their daily home and outdoor life, and to the part which the worship of the Olympian deities had in the development of decorative art. The recognition of the local deities took, he said, the form of something made or something adorned—in a word, of some of those objects of which the classical archaeologist takes account. Busy were the craftsmen of a land in which such outward tokens of religious veneration were in constant request, while to help them in their task they had the advantage of a copious supply of varied and picturesque artistic motives, taken, it was pointed out, from the history of the gods themselves, their worship or their favourite animals and flowers. A picture was next given by Professor Baldwin Brown of a walk through ancient Hellas, in which its artistic features and surroundings were humorously contrasted with some of the outstanding features of a modern city, such as the gasworks, the railway goods shed or the factory, and it was also shown how the “old things” of the ancients entered into their religious home life. While dealing almost exclusively in his opening lecture with the minor forms of ancient art, the Professor remarked that of course the study of the great masterpieces of Hellenic art in sculpture, painting and architecture must occupy the greater part of any session's work in classical archaeology.

Professor Butcher said that in the early part of the century scholars too often ignored the sidelights which were thrown on literature by art, and it was only since the historical spirit had got thoroughly into classical scholarship in the last twenty-five years that the true value of whatever threw light on ancient modes of life had been appreciated. They really got a defective view of antiquity unless classical archaeology was studied, and he hoped many students, especially honour students, would take advantage of this course of lectures, which could not be had anywhere else in Scotland.

GLASGOW INSTITUTE OF ARCHITECTS.

THE annual meeting of the Glasgow Institute of Architects has just been held, Mr. W. Forrest Salmon, the president, in the chair. Mr. C. J. Maclean, secretary, submitted his report, which made reference to the death of Professor Veitch, one of the honorary members of the Institute, and of Mr. James Hamilton, 112 Bath Street, one of the original members. The number of ordinary members on the roll stood at fifty-two, and the Council has it in view to submit at an early date the names of one or two on whom honorary membership might be conferred. The last of the single examinations will be held next month in London and the provinces, after which the system of graded examinations, promoted by the Royal Institute of British Architects, will come into full force. In the competition for the Alexander Thomson Memorial Prize six sets of drawings were sent in, and after a minute examination by the Trustees, it was decided by a majority that the design marked “Theta” was the best. On the envelopes being opened it was found that the prize drawings were executed by Mr. John H. Craigie, Grantly Street, Shawlands, and a committee was appointed to arrange with Mr. Craigie regarding the four which he is to make in terms of the conditions of the competition. The standing committee on public architecture have had under consideration

the designing of the public buildings of the city of Glasgow, and, on their initiative, the Council of the Institute are in correspondence with the Lord Provost on the subject. The Council were again in communication with the Police Commissioners regarding the promised exhibition of the plans of the bridges proposed to be erected over the Clyde, and a letter was received from the Commissioners stating that the original drawings of the proposed bridges had been departed from, but that the Institute's suggestion as to the public exhibition of the drawings would be kept in view when new drawings had been fixed upon. The finances of the Institute were reported to be in a satisfactory position. The Chairman, in moving the adoption of the report, said they were gradually making the position of the architect as strong and as good as they could. Referring to the correspondence with the Lord Provost, he said there was an opinion abroad that the very large expenditure of money on public buildings were not done in the most judicious way. Their Council had some correspondence with his lordship on the subject, and had suggested that the Town Council should be asked to appoint a committee to consider the advisability of employing independent architects. In this way a selection could be made from a wide circle of architects, among whom will be found diversities of gifts for diversities of employment. The architect had his reputation to sustain, and if employed in public buildings would not be slow to let what light was in him shine forth. Surely it would be for the public advantage that architects of the greatest experience should be employed to design and superintend their buildings. No one could find fault if one in his private capacity should employ an indifferent architect to design his warehouse or his mansion, but when public money was being spent the case was different. The report was unanimously adopted.

THE LATE JOHN GUTHRIE SMITH.

GLASGOW has suffered a great loss by the sudden death, the *Glasgow Herald* says, of Mr. John Guthrie Smith, late Dean of Guild. Mr. Smith was an eminent instance of the truth of the saying that it is only a busy man who has time to do anything. Amid all his distractions and occupations he always found time for reading, and, more wonderful still, for writing. He was a well-read man, but his special province was Scotland and the family history of Scotland. His knowledge of Glasgow was almost unique. He seemed to know all the events of its history and the men who had made it, as if he had lived with these men and been present at these events. The extent of his knowledge was only equalled by his generosity in communicating it to others. He gave a signal instance of this in connection with the late Glasgow exhibition. Time and trouble were lavished on it and it was due to him in no small degree that the exhibition was so successful. His contributions to "The Old Country Houses of the Old Glasgow Gentry"—which was written by him, the late John Buchanan and Dr. J. O. Mitchell—are an invaluable mine of information to all workers at Glasgow history, for he was thorough in all he did, and his accuracy could ever be depended on. His *magnum opus* was "The Parish of Strathblane," published in 1886, a model of what a parish history should be. Indeed, the words "parish history" give but a faint idea of the book. It is rather a history of the West of Scotland, told in the most interesting way, with a wealth of illustration, but without ever losing grip of the main subject, the history of the parish. At the time of his death Mr. Smith was engaged on a history of Strathendrick, and if it be not far enough forward for publication in whole or in part, the history and archaeology of this part of Scotland will have sustained a great loss, for he was an archaeologist of the best type. He had firmly grasped the great principle that the use of archaeology is to connect the past with the present, and so to interpret the present by the past. He was a man who in such matters knew the facts and was invariably accurate, but who made the dry bones live by suffusing the facts with imagination.

TABLETS IN EDINBURGH.

AT the annual meeting of the Edinburgh Pen and Pencil Club Mr. Harrison, on behalf of the tablets committee, presented a report of the work which the club had accomplished in marking houses in the city in which distinguished Edinburgh men had lived. He explained that the committee had adopted a different plan from that followed in London, where a uniform style of tablet was used. In Edinburgh it had been resolved to treat each house separately, according to its architectural character, and in every case they had consulted the tastes, as far as they consistently could, of the different proprietors, both as to the design of the tablet and the material employed. The proposals in regard to the erection of tablets had been most cordially received in the city; but, of course, the procedure

adopted had entailed great labour, and also a considerable expenditure of time. The committee had already placed a tablet on 39 Castle Street in honour of Sir Walter Scott, and tablets had also been placed on the house at the corner of St. Andrew Square and St. David Street, where David Hume lived, and on the house at Comely Bank, where Thomas Carlyle lived. A bronze tablet is to be put up immediately at the top of Lady Stair's Close to draw attention to the house in which Burns lodged when he first came to Edinburgh, and a tablet in the same material had been arranged for and would be erected on a land in the Canongate at the top of Panmure Close, where Adam Smith resided while in Edinburgh. A tablet in honour of Sir Henry Raeburn was in hand and would be placed on the house in York Place which the great portrait-painter erected and in which he worked, and it had been also arranged to place a tablet on 21 St. Andrew Square, in which Lord Brougham had lived. The committee had prepared a further list of eminent men, and tablets on the houses in which they resided would be proceeded with shortly. The list included Hugh Miller; William Robertson, principal of the University; the Rev. Dr. Thomas Chalmers; Dugald Stewart; Lord Jeffrey; Sir William Allan, P.R.S.A.; James Gregory, and John Napier of Merchiston. The committee were authorised to approach the proprietors of the houses in which these men had lived to get their consent to the erection of the proposed tablets.

STREET ARCHITECTURE IN CAPE TOWN.

EVERY citizen is interested in the rebuilding of Cape Town now going on so rapidly, says a writer in the *Cape Times*, and in the style of the street architecture—if style it can be called. A merchant, if he builds a new store, thinks more, perhaps, of the inside accommodation than of the outside appearance, or if he does think of the latter it is probably more as a good advertising elevation than as an elevation artistic in itself and suitable to the street.

It is useless in Cape Town to expect anything like the harmonious style of frontage so welcome and conspicuous in the streets of Melbourne. Until recently a three or four-storeyed building was almost unknown in the city. The result is that the old buildings are utterly dwarfed and put out of countenance by the more ambitious elevations now in progress, and the perspective view of the leading streets presents a jagged sky-line, grotesque in its ugliness. The most enterprising burglar could not climb very far along the roofs of Adderley Street without a long ladder or a fire-escape. The Town Council have forbidden the erection of wood and iron structures in the leading thoroughfares, and are looking after the stability of the buildings, and seeing that the verandah-posts do not encroach too much upon the narrow pavements. It is a pity they cannot go a little further, and secure some sort of harmonious, if not uniform, construction.

Seeing that this cannot be, it may be well to indicate the leading features which should be kept in view in a new street building. It may be said at once that ambitious attempts at ornamental houses are always hideous in a street line. What is called the "pavilion" style of architecture never ought to have a place in a street. Roofs made florid with iron railings, figures on small excrescences—like wash tubs upside down—are simply hideous. A roof-line, or if it sounds better, a sky-line in stone or even cement should always be simple; led up to and relieved by a bold horizontal cornice, but never dotted about with grotesque figures, such as pot-shaped abortions, mostly in stucco. Such excrescences are in bad taste everywhere, but with Table Mountain as a background they are execrable. Let anyone look at the roof-line of the new theatre from the railway station and judge for himself how the little stucco figures, with their hats on one side, look with the bold outline of rock in the rear.

Another vital point in street buildings in the Cape climate is depth of aperture both in window and door, for depth of aperture means shadow. Nothing is more unpleasant than a mere plain unrelieved surface in a glaring sunlight. In this respect and others the new post-office buildings are admirable. Let any one look from it to the huge pile on the other side of the street and mark the contrast when both are in the sunlight. The one has a shallow, cardboard front, with the window-panes almost "flush" with the stucco surface, while the other is relieved throughout by a grateful blending of light and shadow, making the sunshine welcome and the shadow restful. The Town Hall at Port Elizabeth, otherwise a pretty and well-proportioned Italian building, is spoiled by the shallowness of the apertures and the card-board appearance of the façade. Every architect designing even the simplest buildings in a warm climate should read and re-read a passage of John Ruskin's in his "Seven Lamps." "And amongst the first habits," he says, "that a young architect should learn is that of thinking in shadow, not looking at a design in its miserable liny skeleton, but conceiving it as it will be when the daw

lights it and the dusk leaves it; when its stones will be hot and its crannies cool. Let him design with the sense of cold and heat upon him; let him cut out the shadows, as men dig wells in unwatered plains, and lead along the lights as a founder does his hot metal; let him keep the full command of both and see that he knows how they fall and where they fade. His paper lines and proportions are of no value; all that he has to do must be done by spaces of light and darkness; and his business is to see that the one is broad and bold enough not to be swallowed up by twilight, and the other deep enough not to be dried like a shallow pool by a noonday sun."

Ah, says the reader, this is all very well as a canon of high art—and costly art—of cathedral recesses where the "masses of stone" are mighty, and genius and wealth have built the foundations broad and deep, but it does not apply to humbler edifices. This is quite a mistake. It is true canon in the simplest building design to look after the shadow wherever the sun is shining. It is as necessary for a design for a homely restaurant as for a dream in stone. Let our street builders try it. It means of course a substantial wall and so some extra cost.

And while on lights and shadows, I may commend the "loggia" as suitable for a similar reason. It breaks the level of the frontage and gives both shade and shelter. A "loggia," as most readers know, is not a verandah, it is part of the building—an open arcade or space within the outer wall surface. It somewhat darkens the rooms screened by it from the sky-light it is true, but not necessarily more than a verandah, while it gives to the building more character. It cannot, however, often be employed in street architecture, unless for a detached building of some pretension.

As for the general style of a street building, little need be considered beyond the points I have named, except to study simplicity and proportion. It is useless nowadays to commend any particular style for ordinary buildings. So much depends on position and environment—whether "arch" or "lintel," or both, be the form of aperture selected; but much, with the most unpretending building, will depend on due proportion of parts, and, if possible, the entrance to a building should always have some dignity. The new post-office may be quoted as a favourable example. The arch line is the same as that of the windows, but it is on a larger scale, and the arch masonry is solid, striking and dignified, and says plainly, "This is the main entrance to a good building." All entrances do not say this. One or two of the designs for the new Town Hall—one particularly with a well-designed loggia—was spoilt by a small "pimping" entrance, which might have been a back door, or have led to an antechamber.

Architects and builders may now congratulate themselves that they have a chance of building with a good working stone, and that the reign of the eternal cement and stucco, at least as an imitation of stone, is broken, if not ended. Cement, we are told, can be made as hard as stone, or harder than a great deal. So it may, but it never looks it. You cannot manufacture ordinary stone any more than you can manufacture precious stones or marble. Blocks of cement are admirable for sinking into the sea, but not for mimicry of stone if you can possibly help it. Thanks for Saldanha Bay, we can help it now, if we have the will and the money.

Let us not, however, despise such material as we can use. It is fortunate that brick is considered by the critics an honest material. Since it is known to be originally, and we may say "of old time," moulded, there is no reason why it should not be moulded into varied forms. It will never be supposed to have been cut, and therefore will cause no deception, and must have the credit it deserves, and it deserves a great deal. What would the builders have done without these useful servants? But may not the brick ask for better treatment? Why should it be smothered with cement? Who does not prefer a good hard, well-coloured, well-pointed brick to a slop brick covered with plaster? A good red brick is admirable material for Cape Town building, because it does not show the red dust. The "Suffolk rubbers" of the Parliament Houses shine and smile through a south-easter, when the cement of the Standard Bank looks miserably ashamed of itself.

A good word may be said even for stucco or cement in its place. It is offensive only as an imitation of stone. It is one of the most useful building materials, and even allowable for plain surfaces and for covering coarse material, when better cannot be had, but it should not be made to appear what it is not.

On October 25, Messrs. Cassell & Co. will issue the first part of a new serial work entitled "The Story of the Sea." This will contain a series of original illustrations by Messrs. W. H. Overend, J. Nash, Gordon Browne, Paul Hardy, W. C. Symons, C. de Lacy, C. W. Wyllie, R. Peacock, Wal Paget, W. Hatherell, W. H. Margetson, Fred Jane and H. C. Seppings Wright.

PREHISTORIC CIVILISATION.

ON Saturday afternoon Professor Boyd Dawkins gave a lecture upon "Prehistoric Civilisation in Western Europe" at the Manchester Museum. In this discourse, by the aid of copious lantern illustrations, the characteristics of the neolithic age and people were described. It was shown that the new-comers, travelling from Central Asia, represented an important advance in the arts of life as contrasted with palæolithic man (dealt with in the preceding lecture), as evidenced by their tools, weapons and household utensils found in the caves of England and Wales, and in the lakes of Switzerland. It was seen that in this age attention was given to husbandry and the rearing of cattle; that the occupations of weaving, pottery and mining were practised, and the foundation laid of the civilisation of the present day. The evolution of the axe, saw, pick, knife and scissors was traced, and also that of the dressing-comb from the primitive instrument (with the teeth at one end) originally employed in the art of weaving. The nearest descendants of the neolithic people, it was stated, are the Basques of Spain and Portugal, the names of whose working tools point backwards to the time when they were a stone-using people. The invasion of Western Europe by the Celts, a more physically powerful people, who were provided with instruments of bronze and who had a better idea of social and national life, was also referred to.

GENERAL.

The Kirkcaldy Town Council have adopted plans by Messrs. Dun & Findlay, of Edinburgh, for the Adam Smith and Beveridge Halls and Library, which will cost over £2,000. Messrs. Campbell Douglas & Morrison, of Glasgow, have gained second prize, and Mr. E. Simpson, of Stirling, third prize.

Berkeley Chapel, Mayfair, has been embellished with wall-paintings in the chancel, at a cost of about 300*l.*, by Mr. Hemming. The subjects are Christ in Glory, the Bread of Life, the True Vine and the Crucifixion.

Mr. Herbert J. Green, of Norwich, has been appointed architect for the new schools for the Langham School Board.

The Model executed by Mr. John Cassidy, of Manchester, has been selected for the Colston statue which is to be placed on the St. Augustine's open space, Bristol. The pedestal is 10 feet high and the statue will be 8 feet. There were over thirty competitors.

The Chester Town Council, by a majority, have decided that the Hop-pole Paddock is to be utilised as a site for the new baths.

A Society has been formed in Birmingham with the title "Midland Record Society," for the purpose of collecting original, and copies of, ancient documents, records, maps, plans and MSS. having reference to Birmingham or its neighbourhood, or which may have a local or special interest, and the transcribing, copying, or calendaring of such documents. Sir J. B. Stone was appointed president; Alderman Johnson and Sir Richard Tangye, the Rev. Canon Gregory Smith, Mr. Bunce, Mr. Timmins and Mr. J. H. Stone were elected vice-presidents; and Messrs. F. S. Pearson and Wilson Wright were appointed hon. treasurer and hon. secretary respectively.

The "Hymn to Apollo," which is believed to have been composed about B.C. 278, and was discovered engraved on marble at Delphi in May 1893 by the French Archaeological School of Athens, was sung by a quartette of students at the opening of the Senior Greek class in Aberdeen University last week.

The Harwich School Board have given instructions to Mr. J. W. Start, F.S.I., architect, of Colchester, Clacton-on-Sea, and Harwich, to prepare plans for an infants' school to accommodate 150 children at Lower Dovercourt, this being the second block of buildings undertaken by the Board.

Messrs. J. A. Lumley & Co. have sold the Ridgehurst Estate, Shenley, Hertfordshire, to Mr. Edward Speyer.

M. Fantin-Latour, whose portraits and flower-pieces are admired in every Academy exhibition, has been promoted to the grade of officer of the Order of Leopold, being the only French artist among the contributors to the Antwerp exhibition who received the distinction.

The Private View of the autumn exhibition (the thirty-third) of the Nineteenth Century Art Society, at the Conduit Street Galleries, will be on to-morrow, and the exhibition will open to the public on Monday next.

Mr. H. Berkomer gave a lecture at Grassendale on "Art Education or Art Culture." He criticised the modes of teaching art at South Kensington, and in the art schools throughout the country; and pointed out that art culture might be made more successful and the character of the student more fully developed.

The Architect.

THE WEEK.

A STATUE of St. Ambrose has been placed during the week in one of the niches in the drum of the dome of St. Paul's. It completes the series of the Fathers of the Christian Church. The Greeks, St. John Chrysostom, St. Basil the Great, St. Gregory Nazianzen and St. Athanasius are the work of Mr. W. F. WOODINGTON; the Latin or Western Fathers, St. Jerome, St. Ambrose, St. Augustine and St. Gregory the Great were modelled by Mr. C. E. KEMPE, and executed by Messrs. FARMER & BRINDLEY. Bere stone was employed. Each statue is 11 feet 1 inch in height, and weighs, including plinth, about seven tons. The whole work was directed by Mr. F. C. PENROSE, M.A.

THE restoration of the crypt and lady chapel in the church of St. Bartholomew the Great, West Smithfield, continues under the direction of Mr. ASTON WEBB. All the old work that remains is being carefully left undisturbed. The crypt will require nothing more than a roof to restore it to its original condition, but the lady chapel suffered from a fire at some past time, especially on the south side, where, however, a small sedilia has come to light. The funds so far are only sufficient to roof in the chapel and make it secure. The floor, the glazing of the windows, and many other works necessary before the chapel can be incorporated with the rest of the church, must stand over until the last 2,000*l.* required is subscribed. The works have necessitated the removal of the fine collection of worked stones which have been discovered in the various excavations. They have been placed in the north triforium, where they have been carefully arranged in the order of the periods—Norman, Transition Norman, Early English, Decorated and Perpendicular. The tracery of the Perpendicular east windows has been laid out on the floor of the triforium.

THE opening meeting of the winter session of the Northern Architectural Association will be held on the 14th inst., when the President will deliver an address. During the session papers will be read on "The Elizabethan and Renaissance Periods," by Mr. O. H. S. CRANAGE; "The Architect," by Mr. F. CAWS; "The Economics of Architecture," by Mr. H. BARNES; "The Buildings on the Acropolis," by Mr. F. W. RICH; "The Monuments of Egypt," by Mr. WM. MILBURN; "An Evening of Notes," by Mr. J. T. CACKETT; "Ecclesiastical Buildings of Yorkshire," by Mr. J. W. TWIST; "Architectural Sketching," by Mr. R. B. DICK; "Organs and Organ Chambers," by Mr. C. W. HOWDEN.

THE annual report of the Council of the Royal Hibernian Academy states that this year's exhibition was, from a pecuniary point of view, an improvement on those which had been held for some years, and especially that the sales of pictures had realised a sum amounting to nearly 50 per cent. more than at the previous exhibition. The following gentlemen have been elected as officers of the Academy during the next year:—President, Sir Thomas Farrell, R.H.A.; Secretary, S. Catterson Smith, R.H.A.; Treasurer, W. M. Mitchell, R.H.A.; Keeper and Librarian, P. Vincent Duffy, R.H.A. Visitors (Living Model School), P. Vincent Duffy, R.H.A.; J. M. Kavanagh, R.H.A.; R. T. Moynan, R.H.A.; W. Osborne, R.H.A. Visitor (Day Living Model School), S. Catterson Smith, R.H.A. Professor of Painting, Nathaniel Hone, R.H.A.; Professor of Sculpture, Sir Thomas Farrell, R.H.A.; Professor of Architecture, Thomas Drew, R.H.A.; Professor of Anatomy, W. Thornley Stoker, M.D.; Professor of History, W. J. FitzPatrick, LL.D.; Professor of Literature, Edward Dowden, LL.D.; Professor of Antiquities, J. T. Gilbert, LL.D.; Professor of Chemistry, Sir Charles A. Cameron, M.D. Trustees, Sir Thomas Farrell, R.H.A.; S. Catterson Smith, R.H.A.; W. M. Mitchell, R.H.A. Auditors, James Brenan, R.H.A.; Charles Russell, R.H.A. The following resolution was adopted:—"That the members of the Academy, in general meeting assembled, desire to express their deep sense of the

loss the Academy has sustained by the unexpected death of Mr. J. L. Robinson, R.H.A., and direct their secretary to convey to his widow their sympathy in her bereavement."

THE opening meeting of the Architectural Association took place on Friday evening. The proceedings were in some respects unique. Mr. MOUNTFORD has proved almost an exceptional president. As an architect we may congratulate him that his abilities have been substantially acknowledged by the public, who have entrusted to him works of very extensive character. The members of the Association, if we interpret their feelings aright, were only too delighted to express their satisfaction that Mr. MOUNTFORD had consented to serve a second year as president. The medals awarded were designed by Mr. GILBERT, R.A. Not having seen them we cannot describe them. The members have had to wait long for the medals, and for that reason there ensued the curious ceremony of distributing medals not only for the past session, but for the two previous sessions. It is a matter to be recorded in praise of the members that only about nine of the prize-winners were found to forego the privilege of being present to personally receive their awards.

FROM the eighth yearly report of the Scottish History Society it appears that only one of the promised publications of the current year has as yet been issued, viz. Mr. S. R. GARDINER'S "Letters and Papers Illustrating the Relations between Charles II. and Scotland in 1650." Mr. C. H. FIRTH'S volume of "Papers on the Military Occupation of Scotland during the Commonwealth and Protectorate, 1651-60," is, however, in progress. It may be expected early in next year and will be followed by the second volume of the "Registers of the General Assembly." The "Lyon in Mourning," Bishop FORBES'S memorials of 1745, which will occupy two volumes, has been transcribed and is in the hands of the editor, Mr. HENRY PATON. Professor MASSON will also shortly be at work upon the "De Unione Regnorum" of Sir THOMAS CRAIG, the text of which will be printed in both Latin and English. Inquiries have been made regarding documents in Holland relating to the Scots Brigade and the Scottish churches in that country with satisfactory results. Since last general meeting the Council have had the good fortune to be offered some fresh materials well worthy of publication. Mr. SIDDONS MURRAY has placed at disposal four volumes of journals and papers written by Prince CHARLES'S secretary, JOHN MURRAY, of Broughton. Mr. A. C. LAMB, F.S.A.Scot., has given permission to publish the notebook or diary of Bailie DAVID WEDDERBURN, merchant of Dundee, 1587-1630, from the original autograph. Mr. DAVID DOUGLAS has lent to the Society for publication a transcript of a diary of JOHN LAUDER, Lord FOUNTAINHALL; and the Council have also accepted the offer of Mr. WILLIAM MACKAY, Inverness, to edit a series of extracts which he has made from the Presbytery records of Inverness and Dingwall from 1638 to 1688.

It would appear from a remonstrance of the Liverpool Chamber of Commerce that the Government propose to erect a new hospital in the suburbs of Smyrna for British seamen and others. It is considered that the position is not convenient. At present British vessels are heavily taxed for the benefit of the hospitals at Smyrna and Constantinople. From a statement showing the surplus of hospital receipts at Constantinople and Smyrna, presented to Parliament in September 1893, it appears that the surplus receipts at Constantinople had amounted to 14,000*l.* since January 1, 1888, and Smyrna to about 2,000*l.* in the same period. It is urged that the dues were fixed when the tonnage of vessels was smaller than at present, and that the charges should be lowered or abolished; in fact, it is desirable that the hospitals should be supported by voluntary contributions, as in other places, and that shipping should be relieved of the impost. Whether that policy is the best is only to be determined by the experience of shipowners. But as an hospital when once erected is not easily removed, care should be taken that the site of the proposed Smyrna hospital is suitable. Apparently it was selected in Whitehall, without any knowledge of the local conditions.

TECHNICAL EDUCATION.

THE Parliamentary return relating to technical education which was issued a few days ago shows that the amount expended during 1892-93 in England, Wales and Scotland was 529,718*l.* 3*s.* 4*d.* A larger expenditure is anticipated during the present year, for the amount allocated was 696,328*l.* 4*s.* 4*d.* It appears that out of the forty-nine County Councils in England forty-one are applying the whole of the residue under the Local Taxation Act to the purpose, and eight partially apply it. In fifty-three out of the sixty-one "county boroughs" the residue is also applied, and in seven a part of it. In Preston the whole of the residue is employed for the relief of the borough rate. The counties and boroughs of Wales devote all the money obtained under the Act to technical education. Scotland is, on the whole, more eager for the advancement of education than other parts of Britain. It is the fact, however, that only twenty-three out of the thirty-three County Councils are applying the residue to technical education, and seven a part of it, while one has the matter under consideration, and two are utilising the money for the relief of rates. Of the 194 burghs and police burghs, twenty-one are applying the whole and fifty a part of the residue to technical education, while 122 are applying the whole to the relief of rates, and in one case there is as yet no decision on the subject.

It is not to be assumed that the Scottish councillors who hesitate to expend the money obtained from Customs and Excise on "Science, Art, Technical and Manual Instruction" are acting unwisely. We all know there are already facilities in the North for the education of all who care to take advantage of them. Again, the logical disposition of Scotsmen compels them to seek a definition of technical education, and judging by the applications of the money which are given in the return, one that will be generally applicable is not likely to be forthcoming. Take one instance. Every southern visitor to Perth after a day's experience is sure to conclude that the staple trade of the town is dyeing and cleaning. It would be reasonable to suppose that a practical system of technical education would have some relation to the occupation in which so many young people are engaged throughout the year. It appears, however, that the technical subjects which are taught in Perth are "shorthand, book-keeping, writing, arithmetic, commercial arithmetic, mathematics, mensuration, elementary science, chemistry, magnetism and electricity, art subjects, architecture, modern languages, woodwork, &c., swimming (including the instruction of boys and girls attending public schools), and 'University Extension' subjects." Every kind of knowledge has its use, but we can understand the members of many a borough council becoming sceptical about such aids to the development of the trade of Perth as architecture and University Extension subjects, while the 345*l.* received would certainly defray some of the borough expenses. In the county of Renfrew there appears to be more shrewdness displayed, for the whole of the money is expended on "cookery for seamen and butter-making." There is a likelihood that from aims so modest, beneficial results will follow. But what is to be expected when, as in Exeter, we find money lavished on such subjects as pharmacy, précis writing, political economy, &c.?

Birmingham has of late years substituted education for politics as the sovereign thing on earth for the cure of evils, and it would be an advantage if the example of the Midland city were more often followed in other places. The people are not disposed to play with technical education, although there is a temptation to do so, since it is controlled by the Science and Art Department. The sum expended out of the residue was 9,500*l.*, and in addition 3,341*l.* was obtained by rate, making 12,841*l.* The subjects selected on which the money was to be expended were brassfounding, carpentry and joinery, electrical engineering, electrical instrument manufacture, electro-metallurgy, mechanical engineering, metal colouring and bronzing, metal plate work, pattern-making and moulding, plumbing, sanitary science, telegraphy and telephony, the manufacture and working of iron and steel, typography. University professors and seekers after sweetness and light will not approve of the distribution of money on an education that is so unquestionably industrial and local, but in these days there can hardly be too much concentration on the perfecting of trades.

Manchester has also made a prudent selection of subjects, for not only cotton-spinning and weaving, bleaching, dyeing and printing are among them, but some which affect other industries in the city. We cannot understand on what principle "quantities surveying, surveying and levelling" were included. They are subjects which can be useful to no more than a few persons, and it cannot be said there is any lack of surveyors in Manchester or elsewhere in England. If surveying is to be taught by means of surplus Customs and Excise duties, why should not lawyers, physicians and divines receive their training from the same fund? Judging by the return, it would appear that surveying and levelling are becoming rivals of repoussé work in the classes, and as generally taught in the evenings we imagine they are alike amusing. If the authorities would limit the teaching to subjects which might be beneficial in the improvement or increase of exports, there would be far less money wasted.

There is one test by which the character and efficiency of the technical classes can always be determined, viz. the buildings where the classes are held. In the majority of the cases one of the Board schools is utilised for the instruction. As a rule students do not care to renew acquaintance with those buildings. Having gone through the curriculum they are satisfied, and if they seek additional knowledge they prefer to find it somewhere else. Then there is an absurdity in the notion of teaching market-gardening, laundrywork, thatching, brickwork and masonry, farriery, cotton-bleaching, mechanical engineering, brewing, fish-curing and so on in a room that was probably occupied with infant classes a few hours earlier. The power of association is strong among the working-classes, and if the Department's inspectors will condescend to become acquainted with the people who are supposed to be eligible for training, they will discover the existence of a prejudice against the use of children's schools which is an obstacle to the success of the existing system. Whether the use of the buildings by parish councils or other bodies will make them less obnoxious remains to be seen. But so far as we have been able to discover, the secondary utilisation of Board and parish schools generally is a failure.

The proportion of the 529,718*l.* which was expended on building was insignificant and must have been far under the outlay on printing placards, which is apparently one of the main objects of the system. In Reading a sum of 1,450*l.* 6*s.* 9*d.* is charged to building, but according to the return the expenditure was "in order to make suitable provision for the reception of the collection of antiquities from Silchester, and restoring, altering and adapting the ancient building known as the Hospitium, belonging to the Corporation, for the purposes of a school of science." We hope it is not intended to give "manual instruction in woodwork" in the vicinity of glass cases full of Roman antiques. In Chester 2,150*l.* was set aside for building; Barrow-in-Furness obtained 240*l.* for the same purpose; Leicester, 2,250*l.* for museum extension buildings; Oxford, 1,084*l.* towards building central and branch schools, and Halifax was exceptionally fortunate in receiving 3,923*l.* towards the purchase of land and erection of school buildings. But the rest of England, town as well as country, must put up with buildings that are not fitted for the instruction of technical students.

It is remarkable that the summaries of the return are made up in such a way it is impossible to discover the average amount of the "expenses of administration." That of course does not include the sums paid to teachers. Apparently, administration costs from 10 to 12 per cent. of the amount obtained, which is far too much for the simple services that are performed.

NOTES ON THE GREAT RAILWAY STATIONS OF LONDON.—I.

[By A CORRESPONDENT.]

THE writer has thought it might be of some interest to offer a few observations from the architectural, not engineering, point of view, on those huge structures, each forming the terminus to the great trunk lines which radiate from London far down into the country side. The design of an important railway station has frequently been the

prize subject for the students of the architectural societies, and also at the Royal Academy. Some of these conceptions, for which medals have been awarded, have really been excellent, with their lavish display of sculpture, too, of the highest class. But they were only destined to remain—on paper, for in London of recent years, with the rare exception of the Midland Railway terminus at St. Pancras, and quite lately with the extension of the Great Eastern terminus, the directors, in the assumed interest of the shareholders, have generally insisted on cutting down the architectural part of these overgrown “sheds,” while money has been freely expended on other parts of the building where it was supposed the outlay would “pay.” At the same time, in the early part of railway enterprise, it must not be forgotten how far otherwise it was, as at Euston, in the great entrance carriage portico and in the central hall, also at Paddington, and to some extent at King’s Cross. On the Continent the principal façade and general exterior of the principal stations in cities and towns has had the distinct advantage of being the work of an architect, or at any rate the engineer has been materially helped in the art part by the former. The enormous hotels, which in several of the London termini entirely mask the railway station behind, are not so commonly found abroad in this situation, so that the outward suggestion of the internal arrangement is more often patent, which certainly is an advantage.

There are, indeed, at the present day few more important factors in our national life than these points of arrival and departure, which the large majority of mankind constantly use either for business or pleasure, and yet it is scarcely sixty years since these institutions were non-existent. It was this feeling which inspired the painter FRITH in his well-known picture of the Great Western Station at Paddington, in which he incorporated, in a dramatic way, many of the heterogeneous scenes which from time to time are occurring at such places. Railway stations are legally public places so long as people do not transgress the law of the land or the by-laws of the company. Though very many are too much in a hurry to look about or take in what they see, yet there are others who have plenty of time on their hands and must perforce wait. Would that there were something better for the eye to study than is usual, where obtrusive and vulgar advertisements flaunt themselves to the ruin of true art! There is but faint hope that commercial instincts will give way in this particular respect, unless it should happen that a new architectural departure takes place in the future terminus in London of the Manchester, Sheffield and Lincoln line at Marylebone, which it is believed will be in a good open situation. Here would be truly a grand opportunity, unless the counsels of the hideous Watkin Tower party prevail, when we should know what to expect. If in the comments which follow the writer “trips” in engineering phraseology, he must sue for pardon, as it has not come in his particular practice as an architect to have to deal with large structures where iron is the principal material used. Familiar as he has been with nearly all the great London railway stations, through using them like many other passengers since boyhood, it was not till he made a special examination of each for the purposes of these articles that he noticed some useful points which, as an ordinary wayfarer, would not have at first impressed him. There is no intention of attempting a guide-book description of the buildings commented upon, as it is assumed they are sufficiently familiar to the readers of *The Architect*. So only those features will be discussed which are salient to the object the writer has in view. Thus much as a prelude. It will be well to commence with the comments on the *older* stations without attempting too strict a chronological order, as this is no exhaustive article on the subject, but only a *brochure*.

Externally the Great Western terminus at Paddington has few architectural pretensions, seen from Eastbourne Terrace, with its booking-offices and clerks’ and other rooms above of commonplace character, while the hotel blocks the south-east end next Praed Street, though there is a wide space between it and the station, utilised for the storage of waggons, &c., and covered over by a low roof, above which the end of the station proper is observable by a side view, no attempt having been made to make any feature of it. The north-east side is a *terra incognita* to most people, except to the cabmen for the arrival platforms, and the

station has no “elevation” there. In fact, without intending to make a pun, the whole of it is looked down upon, being in a cutting, an obvious disadvantage architecturally. What has happened at Paddington is the case with most of the large London stations as regards the elevation, one only, or at most two, sides being visible to the general public, and the rest practically invisible. The writer mentions this, as it will save time in the notes on other stations. In describing the various ground-plans it will be convenient to use those terms which are more commonly applied to ecclesiastical work, *i.e.* nave, aisles and transept. In the case of this building, the plan consists of a wide nave and narrower aisles, having span roofs and two transept-like roofs in the total length. As the north and south ends of the transept ends are *flush* with the sides of the aisles, the term must be taken in rather a Pickwickian sense. There seems no particular object beyond appearance in this arrangement, which must be more expensive constructionally than running the nave and aisles east to west continuously, like the ordinary plan of Cornish churches. But the writer has often admired its effectiveness and the very striking look of the great diagonal ribs at the junction of the several roofs. Though the nave or central roof is considerably wider than the aisles the roof construction is the same, being that of a series of arched flanged iron trusses (without any tie-rods) set not far apart, the principals being occasionally perforated by quatrefoils and other geometrical forms, and only panelled near the springing-line with ornament of a semi-Gothic, semi-Moorish character. The upper part of the roof is glazed on that useful plan, the ridge-and-furrow construction. The late OWEN JONES was wisely consulted by the promoters in its decorative features, and though one of the earliest built, it still well passes muster as compared with later examples of the London terminus. The more modern idea, arising from the enterprise of civil engineers and fostered by the ambition of railway directors, has been to roof all in one span, which desire, though it may be laudable, has landed the builders in unnecessary difficulties, such as would not have occurred had more subdivisions of the width been adopted. The idea of enclosing everything under one big roof was a pretty one, but in practice it will be found that the placing of the intermediate supports necessitated by several spans causes no inconvenience, as is evident on examining some of the large London stations. Possibly smoke and steam hang less about the lofty one-span roofs than in the subdivided one. This is an annoyance sometimes, as at the Victoria terminus of the London, Brighton and South Coast Railway. On the other hand, there is the disadvantage in the former type that the size of the huge roof destroys the scale of everything near and beneath it, and where there are stacks of chimneys to offices or other buildings they refuse to properly “draw,” as at the Midland Station, St. Pancras. Of course there is greater scope for the design and arrangement of the side walls of the one-span roof, owing to the increased height up to the plate. Probably very few of the hurrying passengers who cross the footbridge at the west end of the Paddington Station ever care to look at the view towards the south-east, which is really very effective, though the advocates of the so-called grander examples would say it wants more height. The double transept arrangement of roof, previously commented upon, helps to break that monotonous tunnel-like appearance which other stations have, not to say some cathedrals and churches, and as far as the writer is aware, there is no other such example in London. The two oriel-like structures with Moorish geometrical pattern balustrades that project over the main platform on the departure side, opposite the transepts, as well as the wider central one with semi-domical roof, are indeed very different in their delicate treatment to the average civil engineer’s conception, and thus betray the vanished hand of their artist-architect, OWEN JONES. These picturesque little bits of detail must have delighted many an observant, appreciative traveller waiting for his train to start, though it is to be feared there are a very large number of passengers who resemble the man who went from Dan to Beer Sheba and found all was barren. Though by no means faultless, viewed by present-day ideas, there is nothing vulgar in the ornament of this station, which is refined throughout.

The terminus of the Great Northern Railway at King’s Cross certainly has nothing whatever meretricious in the de-

sign of its façade, which is honest and plain enough in all truth, built substantially of stock bricks without any other material being used. There is the clock turret in the centre, of campanile-like character, and what some ultra-purists would call that dreadful "sham," for all else is a mere front. But in this case everything is transparent, for anyone can peep through the big arched glass panels at the south side of the station and see the horizontal cornice sailing serenely above, regardless of what is obviously beneath and behind. Who is the worse for this? Who is deceived, speaking artistically? Nobody, of course. Though treated in a rather crude way, this façade is a good example of that gentle veiling of what, in all likelihood, would have been an ugly termination, considering the ordinary section of a station roof. Those two arches of great width at the front of this two-aisled terminus, with their several brick rings and orders, were considered a marvel when built, and even now arrest the attention of those who use their eyes. The writer is of decided opinion that in these immense stations, with the large-spanned roofs of the customary type, it is better to mask the ends as done here, or by a hotel or other buildings, so as to effectually stop the big unmanageable shed end. The late historian E. A. FREEMAN used, on architectural principles, to severely denounce the composition of the glorious west front of Wells Cathedral, because its outline did not follow the section of the nave and lean-to aisles, and moreover, the towers, *mirabile dictu*, by the "perversity" of the Mediæval builders were, contrary to the usual procedure, set beyond the aisles on each side, so as to give better scope for the display of sculpture, which extends round these towers except on the engaged side. But no excuse can be offered at King's Cross, artistically, for the obtrusive manner in which some quasi-ornamental shed-like buildings, with rustic arbour-work structures, besides a great deal of litter, conceal the lower part of the station and come in front of the omnibus and cab covered way. There is certainly nothing very much to be proud of in the lower portion of this façade, but the interception is to be regretted, where in all other respects the site is so very open a one, and is scarcely worthy of a wealthy Company. Beyond this plain south front the station has really no architectural pretensions, as the side towards York Road has a species of annexe for cabs attached to the main building, with stores or offices above. Everything is treated in the plainest way, and ordinary stock bricks employed. The booking-office is a lofty hall with flat plaster ceiling having well recessed panels, with a deep cove next the walls. The ticket offices are of the usual ugly character. The gallery or passage which runs along the east wall of the booking-hall at a good elevation is carried on iron cantilevers of poor design, and it is a pity more was not made of what could easily have formed an effective feature if well treated.

(To be continued.)

WILHELM LÜBKE.

THE name of WILHELM LÜBKE is not unknown in this country. The author of such works as "The History of Architecture," "History of the German Renaissance," "History of the French Renaissance," "Foundations of the History of Art," "Mediæval Art in Westphalia," and other writings, some of which have been translated into English and are employed as text-books, must be considered as a sort of cosmopolitan rather than a German. The arts to which he consecrated his life are not to be "cabined, cribbed, confined" by any political boundaries.

As an author he has peculiar interest for us, because what constitutes his principal claim to attention among his countrymen is that he was an imitator of an English system. LÜBKE's volumes have created many adversaries in Germany, but everybody is agreed that he was one of the earliest to make the history of art comprehensible to the multitude. It is maintained, however, that if he succeeded the principal cause was the quantity of the illustrations, and in employing them he was only imitating English precedents.

It is not sufficiently understood that until almost recent times England was far in advance of Germany in the

illustration of books. As soon as CHARLES KNIGHT, with the aid of WILLIAM HARVEY, JACKSON and other artists, had demonstrated that a magazine which was sold for a penny could be embellished with beautiful cuts (some of them costing as much as 50¢), a new era in literature was opened. The artist became an auxiliary of the writer, and by his aid things which were remote became almost ocularly visible. But that aid was not much valued in Germany. The people were habituated to reflection, and they were content with the notions of things which they could themselves create by the help of descriptions. For example there are not many books more crammed with information than KUGLER's "Handbuch der Kunstgeschichte," which the most accomplished of the Prussian monarchs was glad to have dedicated to himself; but the reader has to realise for himself the myriads of buildings, pictures, statues, glass-paintings and other memorials representative of art, from the earliest ages to the nineteenth century, without the help of a single vignette or tailpiece. KUGLER was simply following the common practice, and he was certain that no complaints would arise from the omission. As professor in the Berlin Academy he knew all about the requirements of students.

If in our time a similar Handbuch could not expect to be successful in Germany unless it contained many hundreds or thousands of illustrations, the change must be attributed to the precedent set up by LÜBKE. He was able to claim for himself that he was the first German to whom the thought came that a book relating to works of art required woodcuts, and whatever merit that position can afford unquestionably belongs to him. The innovation was no sudden inspiration; it was the consequence of a long course of training on the part of LÜBKE, and the political changes which in Germany followed the revolutions of 1848 were not without some effect upon it.

LÜBKE was a representative German, one of those men who seem to be destined by nature to be professors, curators of museums, or other variety of dispensers of knowledge. He was born in 1826 in Dortmund, Westphalia. His father was the schoolmaster, whose residence was in the old Dominican monastery. In the town were many other remains of Mediæval architecture which were likely to impress a susceptible boy, especially when they were explained by an affectionate teacher. Young LÜBKE's training was as careful as could be accomplished, for it was necessary for him to take some of the classes as soon as he was competent. He was also required to serve occasionally as organist in the church of Dortmund. The obligations were accepted in good-will, for he realised that teaching imparted definiteness to his knowledge. When in the usual course of things he went to Bonn, in 1845, he was successful in the examinations, and it was not long before he obtained employment in helping students who were less advanced.

He was no less fortunate in other ways. GÖTTFRIED KINKEL, who was subsequently esteemed during his long exile in London, was one of the professors, and there was no man in Germany who was more enthusiastic about art as one of the motive powers of the world. KINKEL's influence on students was so extraordinary, it is no wonder he was feared by the Government when a few years afterwards Young Germany resolved to assert itself. Still more important for LÜBKE was his acquaintance with ANDREAS SIMONS, the Darmstadt professor of architecture, who convinced him that the best place to study the history of art is in front of the examples—advice that was novel to a German. LÜBKE accepted it and was faithful in its observance. By many critics he was taken to be no more than a bookmaker, but for every one of his histories he made repeated journeys in order that the pages might embody his impressions. He began with a study of the Romanesque remains between Cologne and Treves. From Bonn he passed to the University of Berlin, ostensibly to pursue his philological studies. Art, however, continued to exercise its sway over him. In the capital he was able to see a large number of paintings and other examples of art, while in the University he was able to continue his studies of the history of art under Dr. WAAGEN (the author of the "Art Treasures") and Professor HOTH. In Berlin also he became acquainted with JACOB BURCKHARDT, whose "Cicerone" is the best of all guide-books for Italy.

A young man of twenty-two who admired KINKEL was

not likely to be callous when, in the beginning of 1848, Berlin appeared to be emulous of the fame just acquired by Paris in overthrowing royalty. LÜBKE was suspected, and was ordered to withdraw from the city. WAAGEN was not satisfied to lose so promising a disciple, and he exerted all his influence to obtain a revocation of the decree. He was successful.

The earlier financial results of LÜBKE's devotion to the history of art were of a kind which only a young and enthusiastic German could endure. For an investigation of the Westphalian land, in order to describe the Mediæval remains, he received only 250 thalers. But it gave him a right to be considered as an author. His introduction to the study of Mediæval church architecture was hardly more profitable. But the books were sufficient to enable the best judges to perceive the extent of his learning and his sound judgment, and in Germany that would be considered an adequate return for his labour. A great many works requiring far more toil have been produced with the expectation of no other result. LÜBKE was not however satisfied with a reputation that depended on a few professors. He perceived that the interest in the history of art, and especially of architecture, was no longer confined to men like himself. But he felt that the new students must have a different sort of instruction. They were not to be satisfied with abstractions, and he could not expect them to devote the regulation year of wandering to a contemplation of buildings. As a sort of middle course he resolved to utilise woodcut representations to supplement and enhance the descriptions. The adoption of that course may now seem a trivial affair, especially in England, where fine illustrations of buildings were produced sixty years ago by CHARLES KNIGHT in the *Penny Magazine*. But Germany in those days did not keep pace with either England or France. A few popular books were no doubt illustrated, but it is much easier to prepare designs for a history or a book of poetry than views for a volume on architecture. The designs for a belles-lettres work could be created by an artist without leaving his studio, while to represent buildings it was necessary to travel, which in all lands requires money. It was long before LÜBKE could convince a publisher to undertake so costly an experiment. He succeeded at last, and when the "Geschichte der Architektur," with over four hundred cuts, appeared in 1855, it was welcomed as a novelty, and in the course of three years the first edition was exhausted.

One of the results was the appointment of LÜBKE as a teacher in the Bauakademie, or architectural school of Berlin. There he made a good impression among the students. Amateurs as well as young architects found profit in his lectures. He also busied himself with contributions to various journals and in his criticisms he was almost too generous. LÜBKE's ability was recognised in many places, and as the Swiss are always on the look-out for clever teachers he was offered a professorship in Zurich. He preferred to remain for a time in Berlin. He was engaged in preparing his "Grundriss der Kunst-Geschichte," and as it was to contain as many illustrations as the former work it was an advantage to be near the artists and engravers. It appeared in 1860, and judging by the number of editions it may be considered as the most popular of his books. LÜBKE was then able to accept the appointment which was kept for him in Zurich, and during six years he proved himself to be a worthy companion of the band of professors that had won a new reputation for the University. From Zurich he transferred himself to Stuttgart.

It was characteristic of LÜBKE that in proportion as he was esteemed as a master, his work as a student went on increasing. He travelled through Italy, France, Belgium and England, Germany and Switzerland, in search of additional information, as if European art appeared to him an inexhaustible subject. It was during one of those expeditions he met with an accident which would have imposed retirement on many a man. While an architect was discussing with him the characteristics of a building and pointing out details, he unluckily injured one of LÜBKE's eyes with his umbrella. In a short time the Professor could no longer see with it, and the greatest precautions were necessary to keep the other eye from becoming useless. LÜBKE was not to be restrained. If he was incompetent to write he was able to dictate, and

his literary productions were turned out with the usual punctuality.

LÜBKE remained in Stuttgart for the long period of nineteen years, and in spite of illness and other obstacles, faithfully discharged his duties as professor. He was the right man for the office. But he imagined that his knowledge would become more useful in a different place, and he accepted a professorship in Karlsruhe, and there he remained until his death in the early part of last year.

If LÜBKE deserves the credit of introducing a new era in technical literature among his countrymen, it may also be said of him that he contributed to the downfall of the class of writers of whom he was a representative. He created a desire for illustrations, and as the appetite grows with what it feeds on, a history of art with only four hundred examples was considered as being only meagre fare for an ordinary student. The importance of the descriptions and criticism gradually diminished, and instead of supplementing them, the pictures became "the end-all and the be-all" of every book on art that was destined for popularity. As a consequence the long and anxious preparations which were gone through by LÜBKE are ignored, and the value of his books has fallen in the market far more than is reasonable. Photographs not only made his and similar woodcuts and illustrations appear wanting in the accuracy which is indispensable in all technical books, but as by the process various views of one work are easily obtainable, a reaction in favour of special subjects was created. LÜBKE's books are comparable to maps of the world; the newest tendency is towards works which resemble plans on the largest scale.

CHURCH OF ST. LAURENT, AT ROUEN.

IT appears from a communication from M. Ad. Guillon, of Vézelay, to the current number of *L'Ami des Monuments*, the official organ of the French Society for the Protection of Ancient Buildings, which is edited by M. Charles Normand (vol. viii. page 223), that the church of St. Laurent, at Rouen, one of the most interesting examples of fifteenth-century architecture in the Rue Thiers, near the picture gallery, has been purchased compulsorily by the Government under the provisions of the Law of March 30, 1887, with regard to public buildings, which has been put into operation for the first time. The church was the property of M. Courcelle, a notary at Rouen, who proposed to pull down the nave and the external walls, and to convert the church into a private house, retaining the tower and the porch next the Rue de la Bibliothèque, which he proposed to restore. M. Courcelle claimed nearly 26,000*l.* as compensation and was awarded 7,200*l.* The church will now be preserved in its entirety, and this result is largely due to the exertions of the recently established Society for the Protection of the Public Buildings of Rouen, and its president, M. Gaston le Breton.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE Birmingham Architectural Association opened their twentieth session with a conversazione, exhibition of drawings and smoking concert on Monday last. Mr. W. Henman presided, and was supported by Messrs. F. B. Peacock, H. H. McConnal, E. C. Bewlay, A. Harrison, A. Reading and the hon. secs. (C. E. Bateman and H. T. Buckland). Drawings were exhibited by Messrs. A. Harrison, Bewlay, Swan, McKewan, Hart, Son, Peard & Co.; Essex, Nicol & Goodman; also by Messrs. Ernest George & Peto, J. Brooks, R. Briggs, M. B. Adams, E. Newton, G. C. Horsley and other London architects. Before the smoking concert commenced the President handed prizes to Mr. W. J. Pritchard for the best set of measured drawings; to Mr. G. McMichael for the best essay on construction; and to Mr. E. B. Clarke for the best description of buildings in course of construction visited by members of the Association during the past season. Among those who assisted in the musical programme were Messrs. H. Lee Matthews, W. Crosbee, Whitworth Wallis, F. G. Hughes and W. Pritchett. A very pleasant evening was spent.

M. Leon Palustre, the author of a volume on Renaissance architecture and other works relating to art in France, has died in Tours. During the current year he was engaged on a series of articles about French artists of the sixteenth century.

TESSERÆ.

English Monumental Sculpture.

SCULPTURE was so little employed that it is believed there is no sepulchral statue in England of earlier date than towards the end of the eleventh century, though the French had begun to decorate their coffin-lids with figures, &c., as early as the ninth. We may conclude, therefore, that this practice was first introduced into the country at the Norman invasion. All the oldest monuments in which figures are thus represented are of ecclesiastics. Two specimens of these sculptured effigies, carved in very low relief on coffin shaped slabs, may be seen in the cloisters of Westminster Abbey. They are supposed to represent two abbots, Vitalis, who died in 1087, and Crispinus, who died in 1117. Similar monuments are preserved in Worcester Cathedral of St. Oswald and Bishop Wulstan. These sculptures, of extremely rude design and workmanship, have been much injured by time and violence, but they are curious as the earliest examples of the kind in this country. It has been thought probable that one reason for not decorating with figures or any distinguishing device the stone coffins in which more illustrious persons were enclosed, was to preserve them from the chance of violence which might have been offered to them, in order to gain possession of the ornaments that usually were deposited with individuals of exalted rank. Several monuments of bishops and abbots which have been opened have shown the deceased fully habited in his episcopal robes, with his ring on his hand and an enriched crozier either lying by his side or across the body. The more sacred character of the occupant of the tomb, and of the objects buried with him, might prevent any indignity being offered to them; but kings and princes would not be considered in the same view, and as they would no doubt be even more richly dressed than ecclesiastics, however high their rank, their tombs would offer greater temptation to sacrilegious avarice. The circumstance of the tomb of William Rufus in Winchester Cathedral being entirely devoid of ornament may be thus accounted for. That of Gundred, daughter of William the Conqueror, at St. John's Church, Southover, is inscribed and embellished with foliage, heads and other decorations, but there is no figure of the deceased on it. When the Crusaders returned from the Holy Land they endeavoured to introduce into England a taste for the magnificence they had witnessed in foreign countries, and imitations were attempted of the rich foliage and other decorations employed in their architecture. In the west door of Rochester Cathedral are some figures so applied. Probably the earliest specimen in England of figures in armour is of the time of Richard I. Those in the Temple Church, of Magnaville or Mandeville, Earl of Essex, and of two other knights similarly habited, may be of that date. The first example that occurs in England of a monumental figure in royal costume is that of King John, on his tomb in Worcester Cathedral. An interesting proof that the figures carved on the lids of tombs were tolerably accurate representations of the persons whose remains they contained, was afforded by the opening of the coffin of King John in the year 1797. The body, &c., was in a state of sufficient preservation to show that it had been dressed in precisely the same costume as that represented in the sculptured effigy.

Columniation and Fenestration.

Different orders or repetitions of the same order being applied to the several storeys of buildings whose fronts were pierced with windows, it became unavoidably necessary to abandon all proportion of intercolumniation and to space the columns according to the breadth of the piers and the apertures between them. That arrangement in turn left hardly any alternative than to engage the columns themselves, that is, to attach either half or three-quarter columns to the walls, because insulated columns placed so wide apart from each other would have had an exceedingly poor and meagre effect. Moreover, where one order was placed above another, two straggling rows of low insulated pillars—for low they must be in comparison with the entire height—would have produced an appearance positively disagreeable, and instead of at all ornamenting a building, would have encumbered it with what would have resembled stages of scaffolding. Should anyone question this, he has merely to fancy all the columns brought forward two or three feet in the front of Whitehall Chapel, and then judge whether it would be at all improved by two such sprawling galleries standing before it. For a somewhat similar reason, either pilasters were substituted for engaged columns, or the entablature was made to break over every column—as in the building just mentioned, which may be referred to as a tolerably characteristic specimen of Italian style in buildings of that class, without those capricious abnormalities which so frequently offend us even in the buildings of Palladio himself, although he has the reputation of being comparatively chaste in his designs. For if, instead of being thus broken, the entablature were continued from column to column in each storey overhanging the face of the wall, it would produce the

appearance of heaviness as well as weakness. One defect attending this practice of giving a separate order to each storey is that the columns become insignificant both in proportion to the entire front and to the windows between them, more especially when the columns are further shortened by being placed on pedestals. In fact, windows and doors are generally the predominant features in Italian composition, even where two series are comprised within one order, being generally more prominent in their cornices and pediments than the other projections. They are often decorated with smaller columns or pilasters, and Palladio has sometimes loaded them by recumbent figures on the raking cornices of their pediments. Sometimes, as in the upper order of the Procuratie Nuove, by Scamozzi, at Venice, the windows (decorated with a lesser order) are carried up to the height of the capitals. In the court of the Louvre the pediments of the windows come immediately beneath the architrave of the order, so that in proportion to the entire mass and to the windows, the entablatures of the several orders become little more than deep moulded string-courses dividing the storeys of the building, and the columns mere expletive decorations attached to the piers. The ornamental details may be in imitation of the members of an ancient order, but the character of the antique itself is entirely gone. Even where the windows are kept more subordinate to the order itself, the effect of the latter is frequently diminished by the addition of a heavy attic pierced with windows occupying its entire length and surmounted in turn by a balustrade, having perhaps a formal row of statues on its pedestals, which viewed at a little distance assume the appearance of so many pinnacles on the summit of the building, while the balusters themselves in such case suggest the idea of perforated battlements, in which, we may remark, they appear to have originated, since there can be little doubt that their name is derived from *balestra*, the cross-bow, from which arrows were shot through apertures in the parapets of fortified buildings.

The Mile and the League.

The leuca of the ancient English law-writers is necessary to be determined before the rights given by many charters can be defined; but unfortunately the length of this measure is enveloped in utter confusion. Modern lawyers evade the question by setting it down as a mile; thus the legal minimum distance between two markets, which was certainly seven leuca, is now called seven miles. By citations in Du Cange, Paucet, &c., it appears that Hesychius distinctly describes the *leugē*, and Jerome, Jornandes, &c., the leuca (stated by Camden to be derived from the Celtic *leach*, a stone), as a Gaulish measure, and the original Gallic league was set down by the Romans as a mile and a half of their own measure, which was in all probability a rough estimation first used in the Itinerary of Antoninus. In that work the distances from place to place in Gaul are frequently given in leagues (always in whole numbers), which are in every instance reduced to Roman miles at the rate of a mile and a half to each league. Hence, taking the Roman foot at 11.62 English inches (which is a mean between the most trustworthy measures) and the pace of five feet at 58.1 inches, the Roman mile of 1,000 paces is 1,614 English yards, and the leuca was therefore 2,421 yards, subject to the error of the Roman estimation, or 1.376 modern English miles, with the same reservation. This leuca in all probability was brought by the Normans into England. It is true that the Saxon charters of Ingulphus describe distances in leuca, but the genuineness of these charters is now considered more than questionable, and perhaps this very circumstance is a presumption against them. But the leuca soon began to vary in size. Du Cange cites an old metrologist who speaks of two leuca, the one legal, of 3,000 paces, the other common, varying much in different countries. In the confusion incident to our subject it will be worth while to remember that it was not uncommon, when a measure was found too short for convenience, to double it without altering its name; thus among the list of old coins (1540) given by John Dee is found the penny of two pence. The registers of Battle Abbey (Sir H. Ellis) and the "Monasticon Anglicanum" (Du Cange) describe the leuca as containing 12 *quarantena* or furlongs. Now the furlong (forty-long) is always 40 perches, and the perch, though varying much, yet was settled very early at 16½ feet. This gives a modern statute mile and a half to the leuca; so that a certain set of old authorities countenance the notion that the leuca was in their time very little more than that of the Gauls. It is not worth while to take into account any possible variations of the foot, since all the information we can obtain is too rough even to make the whole difference between the Roman and modern English foot of consequence.

The Peplos of the Parthenon.

Every fifth year a new peplos, peplum, or sacred veil was carried in solemn procession to the Parthenon. It appears to have been an extraordinary work of female ingenuity. It was a piece of embroidery, or perhaps of tapestry, on which all the women of distinction in Athens were proud to be employed

it was planned, and all the more delicate details worked out by them, while the younger females of their households, as also Trojan female slaves, were employed in subordinate departments. It might seem that anything which could appropriately receive the name of a veil would be too small to afford scope for so many workers; but it must be borne in mind that the statue itself was 40 feet in height. The garment worn by the Greek females under the name of peplos was a sort of large shawl which could envelop nearly the whole or only a part of the person of the wearer, according as she pleased; and it was also sometimes thrown around the head; so that this costly peplos for the Minerva statue was probably large enough to cover the entire figure, and must therefore have had a great extent of surface. The subjects embroidered on the peplos were the heroic deeds of the Athenian heroes, aided by their redoubtable goddess. The destruction of the Titans and of the Giants were favourite subjects, as were others of a mythological character; but by degrees a spirit of adulation led to the custom of embroidering the names, the portraits, or the achievements of living heroes on the peplos; an honour which was too gratifying to be resisted by those to whom it was offered, however derogatory to the more solemn and mythological spirit which instituted the ceremony. In order to give greater pomp a ship was constructed to carry the peplos. This ship was provided with concealed machinery as a motive power, and the peplos was spread out upon the masts like a sail. The ship, chariots, horses, beasts for sacrifice, and other component parts of the procession, were assembled in an open place called the Ceramicus, from whence they went through and about Athens, and ascended the Acropolis. Having reached an open place in front of the Parthenon, they formed two lines or parties, which, beginning at the south-west angle of the temple, went round it in great state in opposite directions; one passing along the south side from west to east, and thence to the centre of the eastern side; and the other passing along the west and north sides to the centre of the east side. Here both parties joined. The procession was of a most varied character. Old men bearing branches of the sacred olive; matrons of advanced years similarly but lightly burdened; citizens of Athens, vigorous of form, and carrying spears and shields; occasional sojourners at Athens, bearing vessels and other implements; wives of the Athenians, attended by the wives of the sojourners, who carried water-vessels for them; daughters of the Athenians, attended by daughters of the sojourners, who held umbrellas over them (for the Athenians were always careful to proclaim their superiority over their neighbours); youths wearing only slight scarves, and singing praises to Minerva; young women of high repute and esteem, dressed with the utmost splendour, and bearing costly vessels and caskets to be used in the sacrifices; other young females, probably of lower rank, carrying umbrellas, vessels of water and seats, for those of greater rank; these, besides the hip, chariots, horsemen and animals to be sacrificed, formed a splendid array.

Sir John Soane's Ceiling Lights.

Soane is believed to have been almost the first who attempted to give importance and decorative character to skylights and ceiling windows, or windowed ceilings, as they may be termed, making them ornamental features in his interiors, varied in their design, and producing great diversity of striking effects, occasionally heightened by the light being transmitted through tinted glass, so as to diffuse a warm sunny glow over the apartment. The offices at the Bank of England afford many studies of the kind, while his own house (now the Soane Museum) shows what he accomplished by a similar mode of treatment upon a very limited scale. It cannot be said that the taste which he otherwise displayed in internal architecture, even in those instances, was the most refined, for it was exceedingly unequal; yet many valuable hints may be derived from what he did in that way, and it seems to have had the good result of inducing others to render such method of lighting interiors highly effective and ornamental. Among other novel contrivances, Soane occasionally introduced narrow skylights or glazed panels around the ceiling of a room, not for the purpose of lighting the whole of it, but of obtaining a strong light immediately on the upper part of the walls and on pictures in that situation, an effect rendered more striking in consequence of such openings being made above the general level of the ceiling, and therefore in some measure screened from view. At other times he occasionally placed a lantern immediately upon the walls of a room, that is, he carried up the latter above the roof, opening windows in it on every side, immediately below the ceiling.

Domesday Book.

The Domesday Book of William the Conqueror contains the results of a minute survey taken by commissioners appointed by that king and completed in 1086. Ingulphus, a contemporary writer, states this survey to have been made upon the model of an earlier work of the same nature ordered by Alfred and called the "Roll of Winchester." No such record,

however, has been discovered, and its existence at any time is doubted. It has been supposed, with some appearance of probability, that the "Dome-boc" of Alfred, which is not a survey, but the code of Saxon laws, may have been confounded, by reason of the similarity of name, with the later work called "Domesday." This supposition is confirmed by the fact that the latter was also called "Liber de Wintonia" and "Rotulus Wintoniæ," as the inquiries when taken were sent to Winchester and there entered in a register. This survey extended to the names of the owners of all lands in the reign of Edward the Confessor and at the time of the survey; the number of tenants and serfs of different ranks and denominations, the divisions, quantity, tenure and value of lands, whether pasture or arable; forests, parks or vineyards, the number and value of mills, salt, iron and leadworks, fisheries and other property, and whether any advance could be made in the value. So minute was the inquiry that in some counties the number of young cattle, sheep and working horses is stated, and even how many hogs the woods will support. "So very narrowly, indeed," says the Saxon Chronicle, "did he commission them to trace it out that there was not a single hide nor a yard of land, nay, moreover (it is shameful to tell, though he thought it no shame to do it), not even an ox nor a cow nor a swine was there left that was not set down in his writ."

The Old Southwark Bridge.

The wooden bridge which connected Southwark with London was burned in a fire which consumed great part of the city (A.D. 1136). It was however repaired in a few years afterwards, and in A.D. 1163 still more thoroughly restored. It is probable that the charge of these repairs led to the erection of a more stable fabric of stone (A.D. 1176-1209), which remained till within the last few years. The old timber bridge appears to have been opposite Botolph Wharf, midway between the Custom House and the present bridge; the former stone bridge was between the timber bridge and the present one, at the foot of Fish Street Hill. In order to the erection of the stone bridge, a new channel was cut for the stream, so as to lay the natural bed of the river nearly dry. It appears that the bridge was not at first wholly occupied with houses, for in A.D. 1395 there was a tournament held on it. Stow infers from this that there were then no houses at all on the bridge, but such an inference is by no means necessary. In A.D. 1471 there were houses, several being burned by the Bastard of Fauconbridge. There appears to have been from the first a drawbridge so as to allow the passage of vessels above bridge; also a chapel on the east side; and two towers for defence, one at the south end of the bridge and the other at the north end of the drawbridge. The bridge underwent many alterations and sustained many injuries before its final removal. The most remarkable alterations were the removal of the drawbridge and the clearing away of the houses and other buildings; the last alteration took place A.D. 1756. The bridge itself was taken down in 1831 after the opening of the present London Bridge.

Vitruvius.

The history of Vitruvius is known only by what he casually says of himself in his treatise. He is noticed only by two ancient writers—by Pliny, who enumerates him among the writers from whose works he compiled, and by Frontinus, in his treatise on aqueducts, "De Aquæductibus," who mentions him as the inventor of the Quinarian measure. Neither the time nor the place of his birth is known, but he is generally supposed to have been born at Formiæ (Mola di Gaëta), in Campania, from several inscriptions relating to the Vitruvia family which have been found there. As he dedicated his work to the Emperor Augustus when he was already old, and as it was written before the theatres of Marcellus and Balbus were built, which was in the year 13 B.C. (for when Vitruvius wrote the theatre of Pompey was the only stone theatre in Rome), it follows that he must have been born about 80 B.C., or a little earlier. From what he says in the prefaces to his third and sixth books, it would seem that he was not very successful in his profession; he executed only one public work that is mentioned, a basilica at Fanum. He was, however, at the time that he wrote one of the superintendents of the engines of war, the others being Marcus Aurelius, P. Numisius and Cn. Cornelius, a place which he had obtained through the recommendation of the emperor's sister, and it was on account of this appointment, as he himself says, that he dedicated his work to the emperor. He states that he had received a good education, and was fond of literary and philosophic subjects, that riches were no object with him, and that he was possessed of very little, but that he hoped to acquire a reputation with posterity for the treatise he was then writing. He mentions, in the preface to his seventh book, the architectural writers to whom he was chiefly indebted for information, namely, Agatharcus, Democritus and Anaxagoras, Silenus, Theodorus, Ctesiphon and Metagenes, Phileos, Ictinus and Carpius, Theodorus Phocæus, Philo, Hermogenes, Argelias and Satyrus and Phyteus. He mentions also many other writers who wrote upon subjects more or less bearing upon architecture.

NOTES AND COMMENTS.

OF late the Society for Promoting Christian Knowledge has taken interest in architecture, and some useful books have been compiled with the aid of the illustrations which appeared in the Society's periodicals. In the small book entitled "The Old Churches of our Land," by Mr. F. BALDWIN, nearly all the illustrations are original. They are not as pictorial as those in the volumes we have mentioned, but they serve the purpose for which they were intended, viz. the interpretation of the text. When it is remembered how indifferent the majority of English people are to all things architectural, it is not easy to produce a book on the art which will compel ordinary readers to go through the pages with attention. Mr. BALDWIN offers his book to those who are in search of a hobby. It is difficult to judge of the needs of lay readers, but we imagine the pages will not be considered as unattractive by them. The author is careful to suggest how the growth or transformation of Gothic during the various periods was brought about, but he does not weary the reader by dwelling too long on dates or measurements. The book will enable congregations to realise that numerous village churches can always express the main points of their history although the parish records have vanished. Professional students will demand more from a history of the art, but if all churchgoers were acquainted with the contents of Mr. BALDWIN's volume it would be an advantage for those who practise the art.

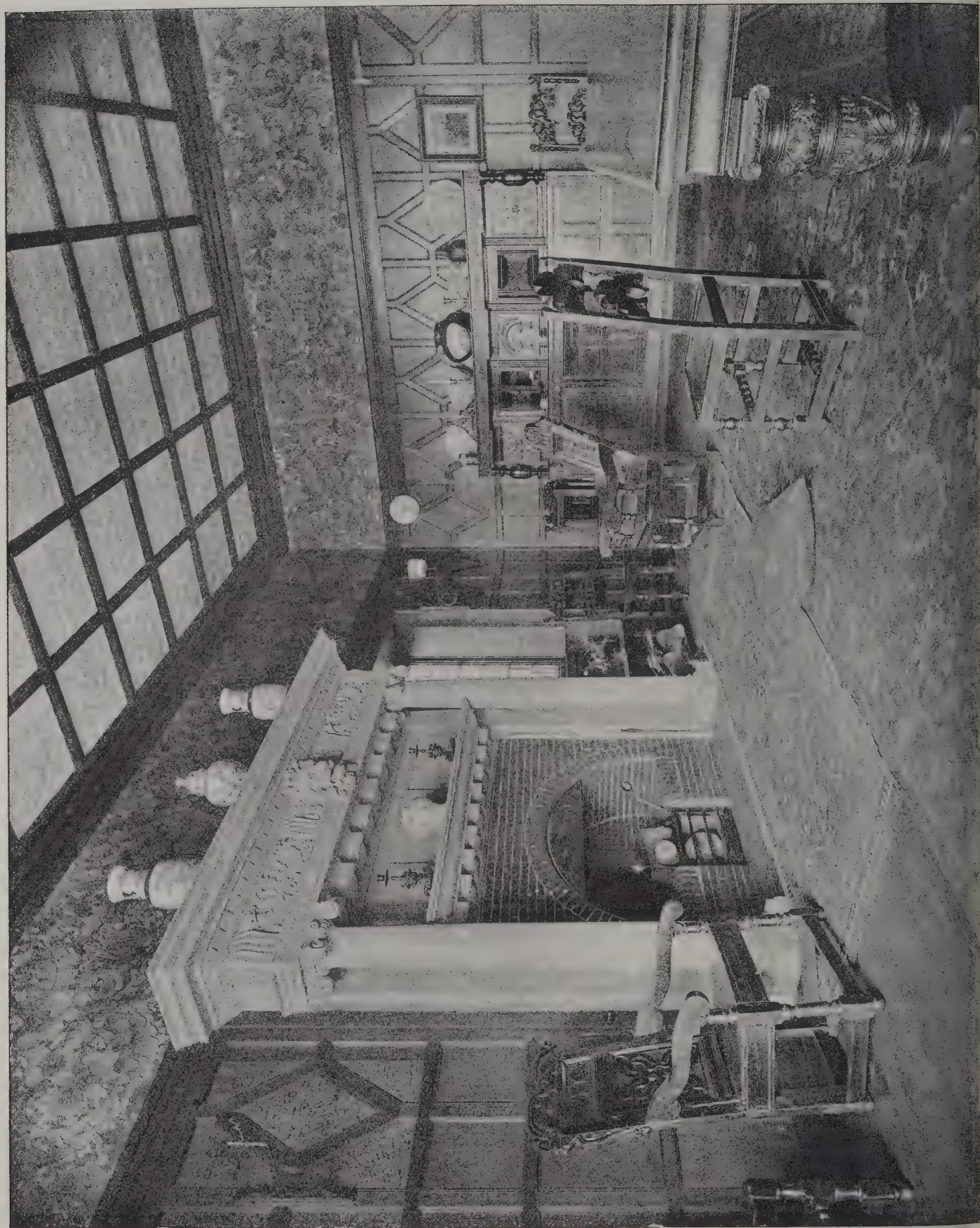
THE anachronism of SHAKESPEARE in making THESEUS a "Duke of Athens," and of BEAUMONT and FLETCHER when they conferred a similar title on their noble SOPHOCLES, has been often discussed. It is remarkable to find M. SARDOU, in his new "Gismonda," has not only imitated their example, but justifies his conduct on logical grounds. People, he says, have imagined that the duchy of Athens was only a Shakespearean creation, whereas it lasted for two centuries, and was a scene of most dramatic vicissitudes. It was a fief of France, and the first duke, OTHON DE LA ROCHE, was from Franche Comté. Like THESEUS in the "Midsummer Night's Dream," the nobles of Burgundy, Flanders, Italy, &c., who were stationed in Athens, did not attempt to pose as citizens of the Periclean Age. They rather recreated the past according to their own image. ULYSSES they regarded as a Crusader, who with other brave barons had left his home to combat the Saracens of Troy who were ruled by PRIAM the Sultan, and in order to rescue the Princess HELENA. They built castles on the model of Coucy, Monthléry, Clisson or Pierrefonds, and surrounded themselves with falconers, esquires, chaplains and minstrels. But M. SARDOU maintains that both Frenchmen and Florentines respected the ancient architecture, and accordingly in his drama he has given a restoration of Athens in its best days. The Acropolis, with the Parthenon, Erechtheum, Pinacotheca, Propylæa, do not appear as they are now visible. There are also the Temple of Daphne on the road to Eleusis, and the ruins of another temple which stood on the Hill of the Nymphs. No trace remains of the latter or of the basilica erected by the Crusaders within the Erechtheum, where the final scene is enacted, but the Roman and other basilicas have enabled the artists to create it. M. MOYAUX, the architect, who has studied in Athens, has been most zealous in supplying sketches and giving information for the buildings. The scenery may not have the novelty that belongs to "Salammbô," for Athens has fortunately escaped the fate of Carthage, still it is novel to see the noble buildings on the Acropolis serving as a background for figures in fifteenth-century costumes.

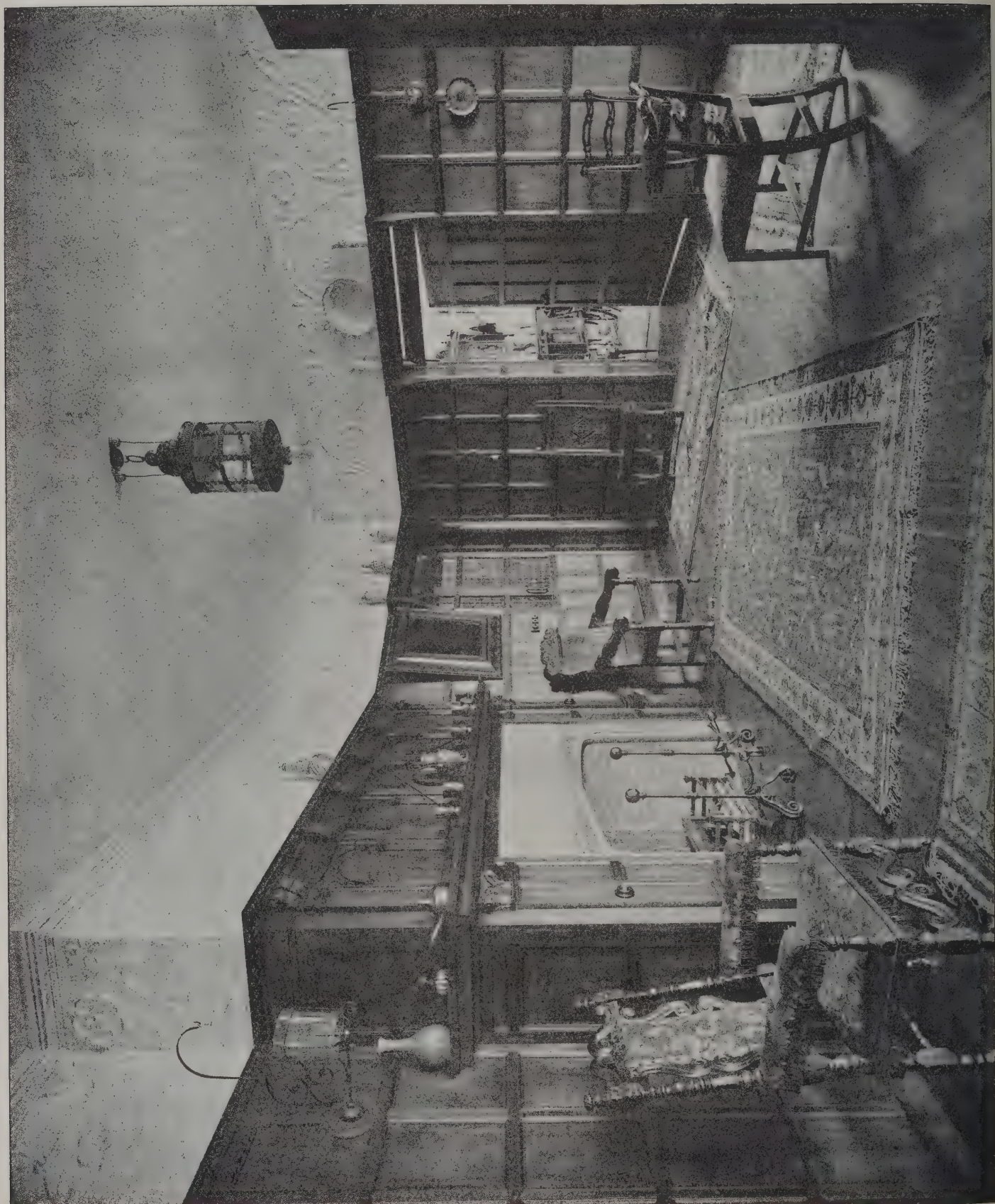
THE exhibition of the Institute of Painters in Oil Colours contains 600 examples. Several of the members are absentees, and those who have contributed do not monopolise a large amount of wall-space. The Institute, in its moderation, sets an example which few societies care to imitate. Views of buildings are numerous. Mr. PILLEAU has two Venetian scenes and one from the Island of Elephantine, Nubia, which denote patient labour. Mr.

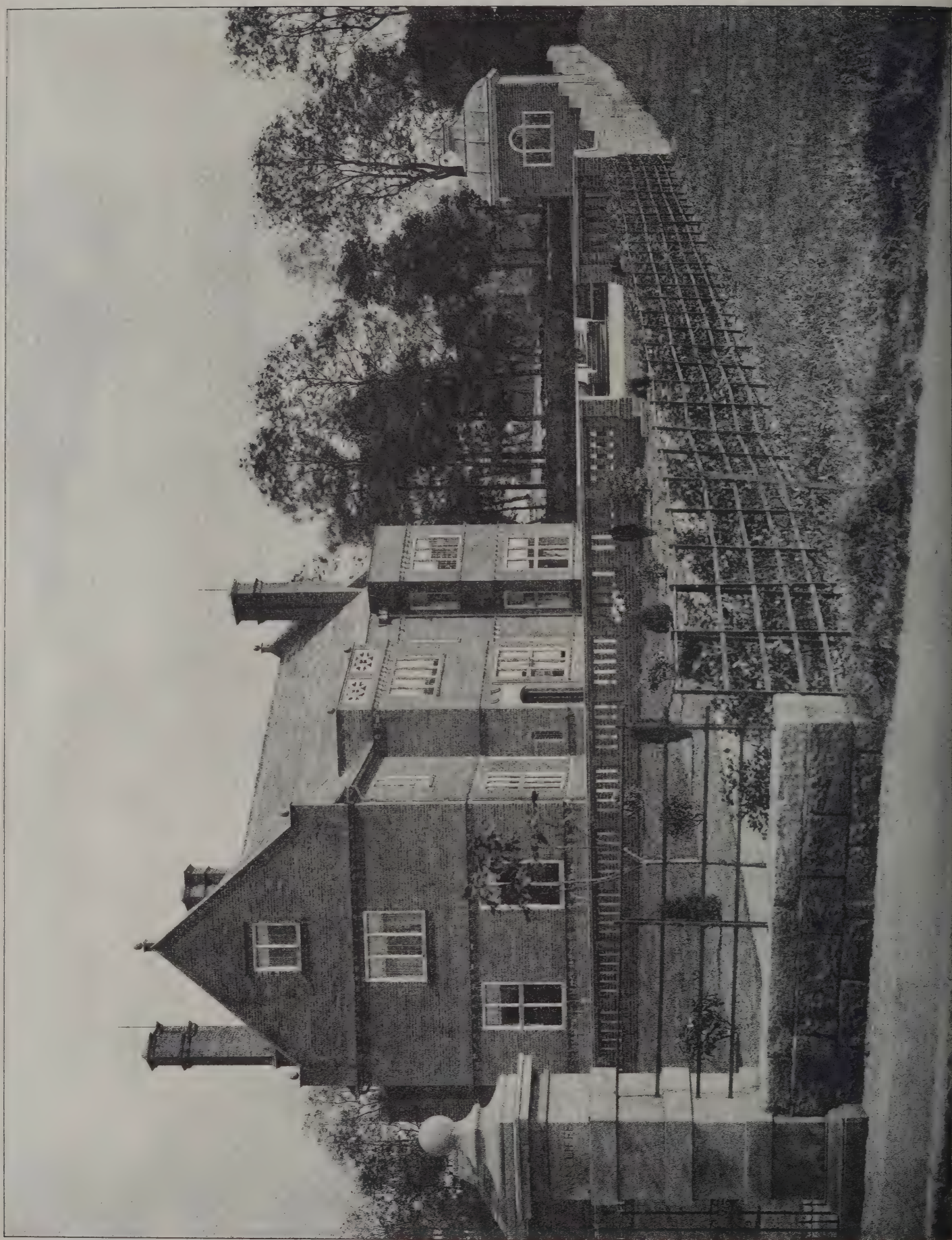
OSBORNE'S *Fishmarket, Galway*, will disappoint those who imagine that the town has Spanish characteristics, but it appears to be as correct as the artist's more familiar scene in Amsterdam. Mr. FULLEYLOVE has increased his English series by *Ely Cathedral from the Marshes*, and he seems to have caught more of the *genus loci* than in the views from Venice and Rome. Mr. F. DILLON has two Egyptian scenes boldly handled. Mr. W. MAY shows *The Old Water Gate, Bruges*, but he might easily have found a more suitable subject in the city. Mr. GRAHAM PETRIE'S *S. Giorgio Maggiore* is interesting as a fresh interpretation of a building on which many artists have tested their power. Mr. HARRY HINE'S *St. Albans* is a record of pre-restoration days. *The Tower Bridge*, by Mr. F. H. MICHAEL, is, we believe, the first representation of the structure in oils, and the Corporation should secure it. A picture of the kind is useful as suggesting that Londoners need not go far in search of the picturesque. Mr. COTMAN'S *Steaming into Lincoln* only indicates the cathedral, but what he gives is sufficient to suggest the difference between past and present, between architecture and engineering. As TURNER painted in rivalry with CLAUDE on one occasion, Mr. COTMAN seems to have emulated TURNER'S railway scene, and of the two we prefer the later work.

THE fresco process of Herr KEIM, in which marble dust is employed among other materials, has obtained the approval of Professor ROBERTS-AUSTEN, of the Royal Mint. He says:—"I have watched each stage of the work, and from the chemical point of view have every reason to believe that this interior decoration will prove to be very enduring. I may add that an alteration which was effected in the roof [of the church at Blackheath-Wonersh] a year ago during inclement weather permitted water to percolate freely through one of the frescoes from the back, and it stood this severe test perfectly." The use of marble dust is almost as old as fresco itself. ALBERTI refers to the three coats which were employed by the Italians, and were known as the *rinzaffato*, or rough coat; the *arriciato*, or sand coat; and the *intonaco*, or fresco ground. For the first he recommends the use of pit sand and pounded bricks, for the second river sand, and for the third pounded white marble. It has been ascertained that the walls of the Baths of Titus in Rome, from which RAPHAEL was supposed to have derived much of his ornament, were coated with coarse sand and lime, lime and pozzolana with sanded and pounded brick, while the surface which was to be painted consisted of lime and pounded marble. GIOVANNI DI UDINE in the Loggia of the Vatican used lime and marble dust, but not finely pulverised, for his third coat. When fresco was revived in Munich the only lime employed was made out of marble pebbles carried down by the river Isar from the Bavarian Alps. In KEIM'S process, while the ground consists mainly of marble dust, lime is eliminated almost entirely from the under coatings.

THE competitors who are to take part in the contest for the prizes founded by Madame CHENAVARD, for students of the Ecole des Beaux-Arts, have been selected by the Council. This is the second year in which that lady's bounty will be utilised. Eight painters, eight sculptors, five architects, a medallist and an engraver are to take part in the struggle. They are allowed five and a half months to prepare their works. Each of them will receive an indemnity, the painters and architects 1,500 francs, the sculptors 2,000 francs, and the engravers 1,250 francs. The prizes will probably be 1,400 francs for the best work and 600 francs for the second work in each of the sections. The amount distributed in that way will amount to 46,000 francs. The revenue that is derived from the property amounts to 68,000 francs. The balance will be partly employed in special prizes and partly in donations to necessitous students. Madame CHENAVARD, whose liberality is likely to aid in advancing French art, was the widow of an amateur. The fortune she acquired was bequeathed to the Ecole des Beaux-Arts, an arrangement which was not agreeable to her relations.







The Architect, Nov. 2nd 1894.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ENTRANCE, "MARYLAND HOUSE," HEADINGLEY.
FRANCIS W. BEDFORD, A.R.I.B.A., Architect.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

BILLIARD ROOM CHIMNEY-PIECE, "MARYLAND HOUSE," HEADINGLEY.

FRANCIS W. BEDFORD, A.R.I.B., Architect.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DRAWING ROOM CHIMNEY-PIECE, "MARYLAND HOUSE," HEADINGLEY.
FRANCIS W. BEDFORD, A.R.I.B.A., Architect.

ILLUSTRATIONS.

ARNCLIFFE, HEADINGLEY.
HALL, ARNCLIFFE, HEADINGLEY.

ON July 27 we published a view and description of this house. The name has, however, been changed from Shireoak to Arncliffe. The view of the hall shows the plaster frieze modelled by Messrs. TARBOLTON & TUGWELL.

ENTRANCE, MARYLAND HOUSE, HEADINGLEY.

DINING-ROOM, MARYLAND HOUSE, HEADINGLEY.

DRAWING-ROOM CHIMNEYPIECE, MARYLAND HOUSE, HEADINGLEY.

BILLIARD-ROOM CHIMNEYPIECE, MARYLAND HOUSE, HEADINGLEY.

Both houses have been designed by Mr. F. W. BEDFORD, architect, Leeds, and the work carried out under his superintendence.

In connection with our illustration of the Queen's Hall, Langham Place (*The Architect*, October 26), we are pleased to state that the whole of the sculpture, carvings, &c., have been excellently executed by Messrs. Sidney W. Elmes & Son, of South Kensington.

On the plan which was published in connection with Mr. Figgis's design for the Northern Polytechnic Institute, a line appears which might be taken for a division of space. It simply marks the junction-lines of the sheets on which the plans were drawn.

THE ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Association was held on Friday evening, when the president, Mr. E. W. Mountford, after distributing the medals and prizes to the successful students for the last session, and having also presented the silver and bronze medals to the prize winners of the two previous sessions, delivered his inaugural address.

Medals and Prizes.

The principal prize-winners of the past session were:—Architectural Association medal, with prize of the value of ten guineas, G. Lucas; measured drawings prize, J. Allen; essay prize, value ten guineas and silver medal, subject, "The history and development of timber roofs in England during the fifteenth and sixteenth centuries," C. de Gruchy; Cates Scholarship, tenable for two years, John Hunt; travelling studentship, bronze medal, C. C. Brewer; Oliver prize, T. F. Green.

Lecture Side.—Division I.—S. L. Crosbie, silver medal; P. J. Groom, bronze medal. Division II.—S. Perkins, silver medal; T. E. Abbott, bronze medal. Division III.—C. de Gruchy, silver medal; J. R. Stark, bronze medal. Division IV.—J. P. Clark, silver medal; A. J. Stratton, bronze medal.

Studio Side.—Division I.—P. J. Groom and H. W. Tomes, certificates. Division II.—T. F. Green, silver medal and certificate; H. C. Trimmell, bronze medal and certificate. Division III.—A. C. Dickie, silver medal and certificate; A. Wood, bronze medal and certificate. Division IV.—J. P. Clark, silver medal and certificate; M. G. Pechell, bronze medal and certificate.

President's Address.

THE PRESIDENT in the course of his address said:—My best thanks are due to you for the great honour conferred upon me by my re-election. It is pleasant to be sure of receiving warm support from not only the officers and committee but from the Association as a body, whenever such support is required. I am very grateful that it is so, and desire to thank you all, and especially the hon. secs. and committee, most sincerely for the support so given, without which no president could carry on his duties with any degree of satisfaction. I am exceedingly glad to say that the past session has been a most successful one, perhaps the most successful we have had under the present order of things. The studio and classes generally have been very well attended, excepting in Division IV., and the work done has been distinctly good. In a large majority of the classes the first man has gained more than the 80 per cent. of the maximum number of marks necessary to qualify him for a book prize in addition to his certificate, while in several cases he has obtained the full number allotted to the subject. This is very gratifying, as is also the fact that of the ninety-six new members who joined our ranks during last session, no less than seventy-three joined either the classes or studio, and that there were seventy-eight students who took up complete courses of lectures and classes, forty of them being in Division I., twenty-five in Division II. and ten in Division III.

As regards those who are really making use of our educational course as we wish it to be used, and who alone can obtain the full benefit of it, you will be interested to know that of the students who worked in Division I. in session 1892-93, fourteen moved into Division II. in session 1893-94, while seven moved from Division II. into Division III. and two from Division III. into Division IV. It was my hope that more students would have seen the advantage of this gradual and sustained progress from one division to another; but this is an improvement upon last year, and we trust the improvement may increase, for only so can the best results be obtained.

The continued want of appreciation of Division IV. has been very fully considered and discussed by the committee, with the result that it has been temporarily abandoned, the subjects hitherto contained therein being either treated as extra subjects or room found for them in other divisions. It is proposed to re-establish it at the first opportunity.

There is improvement also in the competition for our prizes. Six designs were submitted for the Architectural Association medal, while Mr. Brewer carried off the Travelling Studentship with a set of drawings of unusual merit, and although only one entered for the Essay Prize (Mr. de Gruchy), the sub-committee reports that his production is most meritorious and well deserves the prize. The Architectural Union Company's prize was not awarded, neither was that offered by Mr. James Brooks. With reference to this last, I am under the impression that the subject—one bay of the vaulting of the cathedral at Oxford—was somewhat too difficult, necessitating, as it did, the use of scaffolding and ladders, as well as residence in Oxford. Mr. Brooks has, however, kindly allowed me to set the subject for the coming year, and intending competitors, of whom I hope there will be many, will find it not only interesting, but easily accessible with ordinary appliances and within easy reach of London, so that a few summer Saturday afternoons will be sufficient for the work.

I would again strongly impress upon all our students the great advantage to be derived from competing for the various prizes, intelligent study of existing work being of all things the most essential to the success of an architect, and may I remind them of the importance of studying the construction and indicating the joints of wood and stonework carefully and correctly upon their drawings? It would please me very much to see the number of competitors for each prize largely increased.

One cause of complaint which I made last year you have removed entirely. The attendances at our fortnightly Ordinary Meetings have been very good, the discussions frequently quite animated, and this has afforded me much pleasure. My thanks are specially due to the members of the Discussion Section for their valuable assistance in the matter, and to the various gentlemen who read the exceedingly interesting papers which, doubtless, were in a great measure the cause of the improved attendance. If you examine the Brown Book you will see in the syllabus of meetings that our papers for this session are, if possible, of even greater interest than those of last, and it is to be hoped you will show your appreciation of this fact by attending in even greater numbers. You will find papers on subjects purely artistic and subjects which are more particularly practical; amongst others, we have provided for your delectation one in which "Specifications" are treated of from two points of view—the builder's and the architect's. The names of Messrs. Walter Crane, Statham and Pite, Stirling Lee, John Beicher and Pomeroy, are sufficient guarantee of the quality of the material prepared for you. Might I suggest that you should look up the various subjects mentioned in the Brown Book before the meetings, and come prepared, not only to ask questions, but to afford information.

One of our most popular lecturers has gone from amongst us during the last few days. John Loftus Robinson, hon. amateur photographer to the Architectural Association, died on the 12th of this month of typhoid fever. For those who knew him well it is difficult to realise that we shall see him no more in this world, never more hear his infectious laugh; for of all men he seemed to have a superabundance of life, health and good spirits. On the annual excursion he will be immensely missed, for his never-failing flow of amusing stories and the enthusiastic manner in which he threw himself into every kind of fun, helped largely to make the excursions the great success they have been. His photographic records of each visit were most valuable and he always exhibited the greatest energy and industry in making them. He was the first president of our Camera Club. To all here he was known by his amusing lectures, containing most interesting and valuable descriptions of the parts of England visited by the Association, superbly illustrated as they were by views produced from his own photographs. It will be impossible to fill up the blank his premature death has caused and very long before his memory is forgotten!

We have also to regret the recent decease of Mr. Wyatt Papworth. He was always a good friend to the Architectural Association and to his kind offices we are indebted for the generous donation of 50% from the Clothworkers' Company to our general fund.

During last session the Association was actively employed in the consideration of the new Building Act for London, for which purpose a special sub-committee was formed and held frequent meetings. We entered an appearance against it before the committee of the House of Commons and made a determined effort to obtain the abolition of the clauses respecting parapets to party walls, so far as relates to dwelling-houses. In this work our past, vice-president, Mr. Caröe, took a very active part and spared neither time nor money to achieve our ends. In the opinion of most impartial observers he fully proved his contention that there is no necessity for carrying party walls above the roofs of ordinary dwelling-houses, but with the present and late heads of the Fire Brigade against him we failed to carry the point. This is much to be regretted; for all of us, especially those who live in the suburbs or daily traverse them in the train, must know how extremely unsightly they are in small houses and what constant sources of expense and damage to their interiors. Although we failed in this point we were more successful in others, and we may at least congratulate ourselves that the new Act is a great improvement upon its predecessors and removes many irritating restrictions under which architects suffered.

Very much time and consideration have been given by both the committee and a special sub-committee to the scheme originated by Mr. Owen Fleming for the better technical education of London workmen employed in the building trades. Our communications on the subject with the various City Companies, the trades unions and other bodies have received general approval, and with your consent a preliminary conference will shortly be held, at which all the above-mentioned bodies will be represented. When the subject was first broached the paper *London* was good enough to criticise our action with a good deal of disfavour, but as it was evident that it entirely misunderstood our intentions, no one troubled to reply. They seemed to think it was an endeavour upon the part of architects, whom they were good enough to call a "most notoriously ill-educated profession," to patronise the workmen, and advised us to look to ourselves first. Well, no one can say that the Association has neglected the education of architects. That has been our great object for over fifty years, and for a good many years past we have been fairly successful. Our system is not yet perfect, and probably never will be, but it is as good as we know how to make it for the present, and we shall endeavour to improve it still more as time goes on. So having done our best for ourselves, we naturally desired to help the workmen with whose co-operation we are beautifying more or less, according to our abilities, the face of Great Britain. We have no desire to patronise them (why should we?), but merely to treat them as fellow-workmen with a common object. In helping them we are helping ourselves, for beautiful workmanship may go far to redeem a bad design, while a good design may suffer immensely from bad workmanship. The architect is the chief workman, but absolute success in any building can only be obtained by every workman of every trade employed upon it doing his very best, and uniting in a common effort to make the building in all its parts perfectly beautiful and perfectly strong. It is in this spirit that we are approaching the conference, and if, as I believe, the other workmen understand this, we may hope to produce some beneficial results.

In my address last session I ventured to give you some advice upon various matters connected with our art, profession or trade, and the different methods of practising it. I have no desire to detract or alter anything then said, but there are one or two points upon which perhaps you will allow me to say a little more.

It is within my recollection that I advised young architects, by which I mean very young architects, for all architects under sixty are young, to take any work that may chance to come their way, so long as it be honest and at all remunerative, whether it be "light-and-air" cases, "dilapidations," sanitary work, or any other lowly undertaking. As a fact, these things pay very much better than more pleasant and artistic work, as may be easily seen by comparing the incomes earned by the lordly surveyor with those made by the mere architect, and the palace inhabited by the former with the humble home of the latter. I also ventured to advise the aforesaid very young architect to pay no heed to the discussions as to whether his calling be a trade, a profession or an art, but to simply do his level best in whatever work he undertook.

But now I want to remind him that although the surveying work referred to is by no means to be despised, and is indeed very profitable, that it is only to be regarded by him as a means to an end, and that, let it be called what it may, architecture not only is an art, but the greatest amongst arts. It happens that it is not what may be called a popular art, and it neither obtains honours, nor indeed any recognition from royalty or the other powers that be, nor does it command the same remuneration from the British public that the arts of painting and sculpture do. But this, considered in the right light, may possibly be an advantage.

A well-known ecclesiastical writer has put it on record that "the love of money is the root of all evil," and this is most true so far as it relates to art; indeed it might be said that "the love of money is death to all art." Now, a successful painter is very soon in receipt of a large income, is invited into society and in consequence becomes an R.A., and more or less of what is vulgarly called a "social swell." Then comes the end, so far as his art is concerned, for to keep up his newly acquired position he paints not what he knows to be good, nor the best that is in him, but what he knows will sell, pot-boilers in fact, or supplements for the Christmas numbers of the illustrated papers, and so keeping his position he probably degrades his art. Now we are not, at least not yet, beset with these temptations. The public does not run after architects and compete for the honour of employing them. It would never occur to the vast majority of them that architecture is an art, although we may gratefully admit that the number of the intelligent few who do so regard it is on the increase. Very few indeed know a good building from a bad one, and they pay us our 5% per cent. commission, equally willingly or unwillingly as the case may be, whether it be for designing a brick warehouse or a church full of elaborate detail. The very method of payment is obviously against our acknowledgment as artists by the public; they are more likely to class us with auctioneers, house agents, brokers and other individuals paid by commission in a like manner. No, when the great British public speak of an artist they mean a painter, or possibly a photographer, but certainly some one who makes pictures that can be put in gold frames (made in Germany), and hung upon the wall. To them picture-making is art and pictures appeal to them because they can, if the story told by the pictures be sufficiently clear, understand them, and then they buy them and the manufacturers wax exceeding rich. But very few, comparatively, of the public care about or understand sculpture and still fewer architecture, which is quite sufficient proof that of the three arts, architecture is the greatest, sculpture the next and painting last. But the public reverse the order and pay accordingly.

If you consider the work of an architect you will see how responsible it is, and how careful we ought to be to carry out to the very best of our ability all that is entrusted to us. Our work is necessarily conspicuous, and its influence, for good or evil, correspondingly greater than that of a picture or statue hidden away in some gallery or church. Statues and pictures must generally be the property and delight of the more or less rich; our work is for all, from the richest to the poorest. Upon it depends in a great measure the appearance and even the health of our towns, and foreigners form their opinion of the country largely from the beauty or otherwise of the buildings.

Our own motto, "Design with Beauty, Build in Truth," fairly expresses the whole duty of an architect, and happy is he who can do it. The question of what constitutes the beautiful in architecture is more than difficult to answer. There is beauty of form, mass and outline, beauty of colour and material, beauty of detail. Failure in any one of these mars the building, and but few men can hope to attain all.

As regards beauty of outline, it would seem that a change is taking place in our ideas. Not so long ago picturesqueness was the great aim of most architects, and I well remember the mayoress of a considerable provincial town seriously informing me that a leading builder of the town (naturally an authority on the subject) had imparted to her the one way to make a building pretty, which was simply to "cut up the roof as much as possible and use plenty of iron cresting." This opinion was once, no doubt, more or less generally acted upon, but lately men have learnt once more that long unbroken lines and large masses of roof and wall impart a dignity and repose to buildings not to be obtained in any other way. Unnecessary breaks in the roof of a building are to be specially avoided, for they are expensive, constant sources of danger from rain and snow, and being meaningless, are certain to offend the educated eye.

In the matter of colour one is the less likely to go wrong, probably, because the opportunities for doing so are more limited; moreover, in this respect time is good to us, excepting in very smoky towns. In London there can be no happier combination than red brick, Portland stone and Westmorland slates for the exterior buildings, and indeed they would be fairly safe anywhere, but there are many other building stones of great beauty of colour, and both tiles, shingles and lead have good claims to consideration as beautiful roof coverings. On this head I may well refer you to the valuable paper on "Colour in London Architecture," read here by Mr. Beale during last session.

Of the various beautiful colour effects to be obtained internally by the use of marbles, alabaster and glass, it is impossible to speak here. I would simply say, avoid violent contrasts, do not dot slender shafts of dark marble about an otherwise almost white interior, as one not unfrequently sees done in modern churches, and make all the use you can of British materials. Probably a good many people are unaware

of the wealth of red, green and grey marbles to be obtained in our own islands.

Beauty of detail is, perhaps, the most difficult of all to obtain; certainly nothing more marks the distinction between good and bad architecture than the quality of its detail. The tendency of modern times has been to overload buildings with ornament of all kinds, many important buildings having been thereby spoiled. "When in doubt, turn on the carver" seems to be the principle on which many architects work, and no more fatal mistake can be made. Simplicity and breadth are the great things to strive after, and nothing more helps the appearance of a building than abundance of absolutely plain wall surface. What is more beautiful than the effect of sunlight upon a large mass of unbroken wall, where the ever-varying tints of good brick or stone have a chance of displaying themselves? Have carving by all means, but see that it is the best obtainable, and then probably the cost of it will prevent your having too much. Concentrate it, too, in masses and do not spot it all about your elevations; then its richness gives value to the plain wall surfaces which by contrast add to the effect of the carving. It is a good plan when you think you have finished your elevations to go carefully over them again and see what features you can omit, and as you grow older you will probably find that more and more can with advantage be omitted. It is quite possible to design a noble building which shall be entirely free of any (so-called) ornament whatever and owe the whole of its beauty to fine proportion and materials.

To "build in truth" is simpler and, requiring but good common sense, is within the reach of us all. As I understand this part of our motto, it means simply that we should use each material in the proper and appropriate manner. It is not building in truth, for instance, when one designs what professes to be a half timber building and executes the timber in cement, as a good many architects have done. This may be artful, but it is not art, in fact it is merely a poor fraud, by no means justified by the fact that our London and many provincial building regulations bar the use of timber in this manner. A very pleasing front can be made of stucco, used as stucco, as Mr. Colcutt has shown us at the other end of Fleet Street. The use of cast-iron to imitate wrought-iron is another common fraud and one that is quite unnecessary, because cast-iron used in the proper way can be perfectly satisfactory and beautiful, as may constantly be seen in old work. Indeed, effects can be legitimately obtained with cast-iron that it would be difficult or at least extremely costly to get in wrought.

It only remains, therefore, to consider how best a young man may learn to design with beauty, because this is the one great business of an architect. The only way to learn how to design is by the constant study of existing work. I say existing work advisedly, because it is my belief that the study of modern work is as necessary, and more useful, perhaps, than that of old work. Of course he must study old work, but by all means study modern buildings as well. The old men undoubtedly acted upon this principle; they saw what had last been done, and then proceeded to make some improvement upon it, and if we work upon these lines architecture will become more and more a living art. It is my very strong belief that there are amongst us now men capable of doing work better than any done here in the Middle Ages; indeed I often doubt whether we should so much admire some of our famous old work if we could see it "white from the mason's hand." Take the west fronts of Salisbury and Wells Cathedrals, for instance, two of the most admired productions of the Middle Ages. Worn by the hand of time, beaten by the winds, washed by the rains and baked by the sun of centuries, saturated with religious sentiment and surrounded by the glamour of romance, they are most beautiful, and their contemplation fills one with delight. But if they could be done by a modern architect, and stand before us brand new, with all their mouldings clear and sharp, and their every detail as it left the masons' hands, I do not hesitate to say they would receive very much unfavourable criticism from our shining lights. Therefore, I repeat, study old work, but do not fail to study new. There is something to be learned from it all, and though a great deal may be useful only in showing us what to avoid, there is much, very much, that is well worthy of our admiration. Take Mr. Norman Shaw's New Scotland Yard, for instance, and see how that fulfils every requirement as to simplicity, breadth, proportion and colour. Look at the ecclesiastical work of Messrs. Gilbert Scott, Bentley, Bodley and Pearson. Note especially how the latter obtains beautiful results, sometimes with scarcely any ornament and no sculpture. On the other hand, look at the works of Sedding, and see how full they are of charming detail. I could go on with the list, for there are plenty more men, and young men too, capable of admirable work, but I leave you to finish it for yourselves; believing myself in modern work, I want you to do the same.

But whether studying old or really good new buildings, remember that you are not to think that by reproducing certain details of them you are doing the right thing. It is the spirit you have to strive after, the life that is in them, the evident

enthusiasm and love for the work which they all show so plainly.

Last year, in making some reference to the examinations held by the R.I.B.A., I said that it seemed to me that at least they could do no harm, so long as they are regarded merely as the means to an end and not the end itself. Whatever you do, do not get the idea into your heads that the object of your work here is to pass these examinations, more or less creditably. The preparation will do you much good, and the subjects you have to get up are those with which all architects should be acquainted. But remember the knowledge so gained is absolutely the minimum you must have to carry out your work decently. An architect must be a student all his days; no matter how long he lives, there will always be more for him to learn.

Last year also you were good enough to approve by your smiles some remarks I made upon two other subjects, competitions and ghosts. Now, for a man to send in as his own design the work of another, everyone must admit to be a downright fraud, and the man so acting ought to be punished by immediate disqualification. It is a matter that the Institute should take up strongly for the credit of the profession, as nothing can be more damaging to us as a body than the knowledge that this sort of thing is done. The ghosts themselves are by no means free from blame, but I am not prepared to sit in judgment upon them. They do their work honestly, for a more or less nominal sum; but their employers, who do not do the work, and could not do it, take all the credit and all the profit.

A vote of thanks, proposed by Mr. Seth Smith, seconded by Mr. Aston Webb and supported by Mr. Leonard Stokes, was passed by acclamation to the President.

STONEHENGE.

IN *The Architect* of last week an interesting essay by Dr. MacGregor on the dolmens and menhirs of Carnac was published. His conclusion was that "these mile long alleys of colossal menhirs were not merely lines of tombs; they were avenues that led to and ended in cromlechs, and the cromlechs of Carnac, like that of Stonehenge, were temples for the worship of an unknown god, and probably contained altars of sacrifice." That theory represents the latest results of inquiry. It may be well to contrast the early speculations on the subject *apropos* of Stonehenge. They are contained in the following article by the late John Britton, whose name is associated with the history of Gothic architecture in England:—

Stonehenge, with the far-famed pyramids of Egypt and other works of the same class, may be considered as the oldest monuments of man's labour. Being anterior to all written evidence, their history is entirely unknown, and they have been the subjects of much unprofitable speculation, some of which however will require a short notice.

Stonehenge is situated about two miles due west of the town of Amesbury and seven north of Salisbury, in Wiltshire. From its singular character and peculiar situation, which is easy of access, it has attracted more attention than any other relic of antiquity in Great Britain. Viewed at a distance it appears a trifling object; for its real magnitude appears diminished in the extensive plain or open country which surrounds it, and even on a near examination it often fails to satisfy expectation.

In various parts of the world there are circles of upright stones, some of which consist of a single circle and others of many circles; but Stonehenge is of a peculiar character, and is, we believe, wholly unlike any other ancient monument. Many of the stones have been squared or hewn by art, and the horizontal stones of the outer circle are carefully attached by mortises to the uprights, which have tenons; whereas nearly all other examples of what are generally called Druidical circles are composed of rough unhewn upright stones without imposts.

The stones are surrounded by a circular vallum, or bank of earth, within a ditch or foss. Within this bank are three stones, two of which are in an upright position and the other is prostrate. It has been conjectured by Browne, with some probability, that these originally formed part of a circle. In the centre of the enclosed space is what is usually called the temple itself, which comprised originally an outer circle of thirty upright stones, at nearly equal distances apart, sustaining as many stones in a horizontal position, forming a continuous impost. Each of the upright stones had two tenons or projections on the top, which were adapted to fit into and fill up two mortises or hollows in each superincumbent slab. Within this was another, or second circle, consisting of about the same number of perpendicular stones, of much smaller size and without imposts. This circle enclosed an elliptical arrangement of large and small stones; the former, which were divided into groups of three stones each, are called trilithons by Dr. Stukeley and subsequent writers. There were five trilithons,

each of which consisted of two upright stones and an impost, covering or extending to the extreme edges of the standing stones. Before each trilithon stood three small upright stones, and in the central space, or adytum, of the temple (in front of the principal trilithon) was a large flat stone, called the altar.

The dimensions of the stones and the space occupied by the structure, as nearly as they have been ascertained, are:—Diameter of the space enclosed within the vallum or bank, 300 feet; height of vallum, 15 feet; diameter of the outer circle, 100 feet; diameter of the second circle, 83 feet; height of the stones of outer circle, 14 (sides 7 feet by 3); height of trilithons, 16 feet 3 inches, 17 feet 2 inches, 21 feet 6 inches; height of one of the small stones before the same, 7 feet 6 inches.

The stones of the outer circle, the trilithons, the stones in the avenue and adjoining the vallum are, according to Dr. Townson, in "Tracts and Observations on Natural History, &c.," "a pure, fine-grained, compact sandstone, differing only a little in their colour, some being white and others inclining to yellow." They precisely resemble the grey-wethers and numerous other detached masses which lie on the surface of the downs in the vicinity of Avebury and Marlborough. The stones of the second circle and the row within the trilithons consist of "a fine-grained grüstein," interspersed with black hornblende, felspar, quartz and chlorite, excepting four in the circle, one of which is a siliceous schist, another is an argillaceous schist, and the others are hornstone, with small specks of felspar and pyrites. The slab or altar-stone is different from all these, being a kind of "grey cos, a very fine-grained calcareous sandstone," which strikes fire with steel, and contains some minute spangles of silver mica.

The surrounding plain is covered with a profusion of barrows and earthworks, perhaps unparalleled in any spot of similar extent in England and probably in the world. Many of the barrows were opened by Sir Richard Hoare and his indefatigable coadjutor, Mr. Cunnington, and were found to contain in some instances cists or chests filled with burnt bones, and in others entire skeletons, with various relics of British and Roman art. Some other objects besides the barrows demand our notice. The principal of these are the avenue and the cursus. The former is a narrow strip of raised ground, bounded on each side by a slight bank of earth, and extending in a straight line from the entrance, through the vallum of the structure on the north-east, to the distance of 594 yards, at which spot it divides into two branches, one of which continues southward and is seen between two rows of barrows, while the other proceeds northward and approaches within a few yards of the cursus. The cursus is a very curious and interesting appendage to Stonehenge, if it can be properly so considered. It is a flat tract of land, bounded by two parallel banks and ditches, and is situated about half a mile north-east of Stonehenge; it measures one mile five furlongs and 176 yards in length and 110 yards in breadth. Its direction is from east to west, and at the former extremity is a mound of earth resembling a long barrow, which stretches entirely across it. The western extremity is destitute of any mound like that at the eastern end, but there are two barrows irregularly placed near this end within the area of the cursus, a part of which appears also to be cut off by a slight bank. The original purpose of this bank is difficult to determine, for we can scarcely suppose that if the chariots started from the east end, they would be driven over this bank, to the termination of the course at this end. We should therefore be inclined to think that it had been raised at a later period, for some object distinct from racing, if there were not another similar bank thrown across a second and smaller cursus, which is situated at the distance of nearly a mile from the larger one. From the near resemblance of the above work to the genuine circus of the Romans, it is reasonable to suppose that, if not formed by the Romans, it was made in imitation of their chariot course, and by a people familiar with their manners and customs. Hoare's "Antient Wiltshire" contains a very interesting map, showing the surface of the plain around Stonehenge to the extent of about five miles from east to west by three miles from north to south. Within that area are two large encampments, two cursuses, other embankments supposed to mark British villages, and at least 300 barrows or tumuli of various sizes and shapes. Hence it may be reasonably inferred that Stonehenge was a place of great importance in former ages.

The earliest published notice of Stonehenge occurs in the writings of Nennius, who lived in the ninth century. He narrates the particulars of the murder of 460 British nobles at a conference between King Vortigern and Hengist in the latter part of the fifth century, at or near the spot on which Stonehenge is situated, and attributes the erection of the monument to the surviving Britons, who thus endeavoured to perpetuate the memory of that tragical event.

The historical "Triads of the Welsh Bards" refer its origin to the same cause, and relate that it was constructed by Merlin after the death of King Vortigern. This likewise is

the account of Walter Mapes, who is very circumstantial in his narrative.

Geoffroy of Monmouth, who wrote in the twelfth century, gives a similar account of its origin, with the addition of a legend which is repeated by most subsequent writers. He states that Merlin employed supernatural agency to remove the stones from Kildare in Ireland and place them upright on Salisbury Plain, and he adds that they had been in the first instance conveyed to Ireland from Africa. The same story appears in Giraldus Cambrensis (1187), who mentions a similar monument which he had seen on the plains of Kildare.

Henry of Huntingdon, who also wrote in the twelfth century, discredits the story of Merlin, and says that no one can devise by what means or for what purpose such a work could have been raised. Neither Gildas, Bede, William of Malmesbury, Hovedon, Ingulphus, Matthew Paris nor Florence of Worcester have any notice of this remarkable monument, a circumstance which Henry of Huntingdon attributes to their inability to give any account of its origin or use.

Polydore Virgil (1534) says that it was raised by the Britons to the memory of Aurelius Ambrosius. Camden, who wrote in 1586, gives no opinion on its origin or purpose. His description and representation are so very erroneous that it is doubtful if he ever visited the place. John Aubrey, in a manuscript referred to by Bishop Gibson and Sir Richard Hoare, attributes its origin to the Britons prior to the Roman invasion.

Such is the scanty information which our old writers contain about this curious monument of ancient times. Modern writers on Stonehenge, rejecting all historical evidence, have raised their theories on purely speculative foundations. Inigo Jones, in his essay on Stonehenge, undertaken at the desire of King James I., and which was published in one small folio volume by his son-in-law, John Webb, A.D. 1655, endeavours to show that Stonehenge was a temple of the Romans of the Tuscan order, dedicated to Cælus; but he has committed palpable errors in his restorations, to say nothing of the absurdity of his general assertion.

The next essay was written about 1660, and published anonymously in Langtoft's "Chronicle," called "A Fool's Bolt soon Shot at Stonage." The writer considers it to have been a British temple, commemorative of a victory gained by the Cangi of Somersetshire over King Divitiacus and his Belgæ. In 1663 Dr. Charleton published his "Reflections on Stonehenge," in which he contends that it was erected by the Danes, in the time of King Alfred, as a place for the crowning of their kings. Charleton's "Reflections" called forth an essay of 228 folio pages in support of Inigo Jones by his editor John Webb, published in 1664; this essay is of no value. In 1676 appeared a volume by Aylett Sammes, who remarks, "Why may not these giants (alluding to the title of *Chorea Gigantum* given to this monument) be the Phœnicians; and the art of erecting these stones, instead of the stones themselves, brought from the furthestmost parts of Africa, the known habitations of the Phœnicians?" To this sage question one may answer, why may not the stones have come from the moon and dropped down in their present position?

Bishop Gibson, in his edition of Camden's "Britannia," 1694, after opposing the theories of Jones and Charleton, concludes, "One need make no scruple to affirm that Stonehenge is a British monument, since it does not appear that any other nation had so much footing in this kingdom as to be authors of such a rude and yet magnificent pile." The bishop thinks that some part of this temple may have been erected subsequently to the Roman invasion; a conclusion which seems to be very probable. With reference to its modern name, Gibson refers to a Saxon manuscript of good authority, printed by Dugdale in the "Monasticon," in which it is called Stanhengist, proving its traditional connection, at an early period, with Hengist. In 1720 J. G. Keysler, a learned German antiquary, published at Hanover "An Explication of the Anglo-Saxon Monument of Antiquity on Salisbury Plain, called Stonehenge."

In 1740 Dr. Stukeley published a folio volume entitled "Stonehenge, a Temple restored to the British Druids;" he attributes the work to the British Druids. The plates which accompany his volume are good, and Stukeley's restorations are valuable, but a large portion of his essay is occupied with fanciful and irrelevant speculation.

J. Wood, an architect of Bath, published a series of elaborate plans of this structure, in 8vo, 1747. It is his opinion that it was a temple erected by the British Druids about 100 years before the Christian era.

The Rev. W. Cooke, in a treatise entitled "An Enquiry into the Patriarchal and Druidical Religion, Temples, &c.," 1755, supposes Stonehenge to have been held sacred by the Druids and appropriated to the meetings of great assemblies, on civil as well as religious occasions, for which, he adds, "the world does not afford a nobler spot."

Dr. Smith's work on Stonehenge, called "Choir Gaur," 1771, gives a minute description of the structure, with a notice of most of the theories to which we have referred. He considers

it to have been of Druidical origin, and that it was a "great orrery," erected as well for the purposes of astronomical observation as for religious ceremonials.

Edward King, in his "Munimenta Antiqua," devotes much space and applies much learning to the consideration of ancient stone monuments. He conjectures that Stonehenge was constructed in the latest ages of Druidism, when that religion was struggling against Christianity.

Davies, the learned author of "Celtic Researches," 1804, and the "Mythology of the Druids," 1809, has discussed the question respecting the origin and use of Stonehenge perhaps with more research than any previous writer. He supposes that this structure and Silbury Hill are two of the three works alluded to in a Welsh Triad as constituting the greatest labours of the island of Britain, *i.e.* "lifting the stone of Ketti," "building the work of Emrys" and "piling the Mount of the Assemblies." That Stonehenge is really a Druidical structure, the same learned writer remarks, "is evident, from the language in which it was described and the great veneration in which it was held by the primitive bards, those immediate descendants and avowed disciples of the British Druids." It was not exclusively dedicated to the Sun, the Moon, Saturn or any other individual object of superstition; but it was a kind of Pantheon in which all the Arkite and Sabian divinities of British theology were supposed to have been present." As to its date, he remarks that "it was a monument of venerable antiquity in the days of Hengist, and that its peculiar sanctity influenced the selection of the spot for the place of conference between the British and Saxon princes." Mr. Davies further cites a passage in Diodorus Siculus, who quotes Hecateus, describing a round temple in Britain dedicated to Apollo, which he concludes to have been most likely Stonehenge. (Diod. ii. 47.) Sir R. Hoare has entered more fully into this passage ("Antient Wiltshire," i. 155).

The Rev. James Ingram, in his "Inaugural Lecture on the Utility of the Saxon Literature" (1808), considers Stonehenge to have been intended for a heathen burial-place, and the cursus adjoining as the hippodrome on which the goods of the deceased were run for at the time of the burial. This opinion is entitled to some consideration, from the vast number of barrows and other earthworks which abound in this part of the plain.

Mr. Cunnington, in Sir R. C. Hoare's "History of Antient Wiltshire," folio, 1812, observing the difference in quality and size between the stones of the exterior and interior circles, supposes that Stonehenge was erected at different times. He imagines that the larger stones with their imposts constituted the old or original work, and that the small stones of the second circle and those of the inner range were raised at a later time, "as they add nothing to the grandeur of the temple." But this opinion is not warranted by any example among the numerous Druidical circles of Great Britain; on the contrary, it seems more consistent to conclude that the second circle of small rough, unhewn stones, with another circle immediately within the ditch, and some other members now destroyed formed the original or pristine temple, and that the larger hewn stones with imposts were afterwards added. Many arguments might be alleged in support of this opinion, and also to prove that the great circle of upright chiselled stones, with their imposts and the third row of trilithons were posterior to the former, raised by another class of people, and executed at a time when their principles and arts had been considerably changed. At the same time it is conjectured that an avenue of stones was raised, extending from the temple towards the cursus to the north-east, and also that those places for races and other sports were formed at a time when the inhabitants of Britain had intercourse with the Romans.

The "Topographical Account, &c., of Wiltshire," by J. Britton, forming the fifteenth volume of the "Beauties of England and Wales," 1814, contains an accurate description of Stonehenge and of other antiquities in its immediate neighbourhood.

In 1823 H. Browne published "An Illustration of Stonehenge and Abury," in which he endeavoured to show that both of those monuments were antediluvian, and even that the latter was formed under the direction of Adam. He ascribes the present dilapidated condition of Stonehenge to the operation of the general Deluge, "for," he adds, "to suppose it to be the work of any people since the Flood is actually monstrous."

Godfrey Higgins, in a large 4to volume, 1829, entitled "The Celtic Druids; or, an attempt to show that the Druids were the Priests of Oriental Colonies who emigrated from India," has given an elaborate account, with plates, of Stonehenge, but both the plates and the description are from the works of Stukeley, Sir R. C. Hoare and others. His opinion is that Stonehenge "was raised by the Druids, the priests of the nation, who were its sacred architects."

Mr. Waltire gave lectures on Stonehenge, illustrated by models and drawings, and fancifully represented the temple as a place devoted to sacred and mysterious rites, and as forming a planisphere in connection with the surrounding barrows and

other works. Taking up a part of this theory, but allowing a wider latitude to conjecture, the Rev. E. Duke published in the *Salisbury Journal* a long series of essays, in which he endeavours to show that Stonehenge was one of the members or planets of a vast planetarium, representing the solar system and extending over a wide extent of country, "on a meridian thirty-two miles in length."

John Rickman, in the "Archæologia," vol. xxviii. page 399, supposes that "Silbury Hill, the Abury circus, and the avenues of approach to it, were not constructed earlier than the third century of the Christian era, and that the more difficult operations requisite for the formation of Stonehenge may be assigned to the next century, or (to speak with due caution) that this temple was completed before the final departure of the Romans from Britain."

The Rev. Thomas Maurice, in "Indian Antiquities," vol. vi., has a dissertation on Stonehenge, and endeavours to show that the Druidical rites and ceremonies of the West were derived from ancient India, and that this monument or temple must have been erected more than 500 years before the Christian era.

In "Palestine; the Bible History of the Holy Land," 8vo, 1841, by John Kitto, there is a learned essay "On Ancient Monuments of Stone, Druidical Remains," &c., with an elaborate review of this much controverted subject.

In conclusion it may be observed that there appears much less reason for ascribing the erection of Stonehenge to any of the successive conquerors or colonists of Britain, than to its original inhabitants, the Celtic Britons; and if this be admitted it is a probable conjecture that the structure was erected for religious purposes under the direction of the Druids. The practice of commemorating an important event by raising a number of stones is of the greatest antiquity; and there is nothing in the history either of the Romans or the Saxons to lead us to suppose that those nations ever erected temples or monuments like the stone circles of Avebury and Stonehenge.

THE FIRST BOSTON ARCHITECT.

THE lively public interest which has been recently aroused in the disgraceful conspiracy for the destruction of the State House on Beacon Hill, over the defeat of which, for the present at least, it is not too much to say all persons of taste and cultivation in this community are rejoicing, has brought with it, says the *Architectural Review*, a remarkable revival of the fame of Charles Bulfinch, one of the earliest as he was certainly and deservedly one of the most eminent of American architects. A hundred years have gone by since he began his work, bringing enormous changes in the little town which was the chief theatre of his labours—changes which have swept away by far the greater part of the buildings which rose under his hand, and which have lately threatened and still threaten the noblest of them all. But the foundations of his fame were laid too deep and strong to be at the mercy of any material change, and the quality of his work is probably far more adequately appreciated to-day, both among architects and laymen, than it was when he died, just half a century ago.

It may not be quite without profit to turn our thoughts back for a little while to those early days and consider the modest yet distinguished career of the first Boston architect. He was born in 1763, his father, Thomas Bulfinch, being a physician of good standing living in Bowdoin Square. He was sent to Harvard College, where he was graduated with the class of 1781. A place was then found for him in a counting-house, but the occupation proved distasteful to him. The war of the Revolution was not yet ended, and there was little commercial activity in Boston. Bulfinch employed his leisure in reading such architectural books as came in his way—we cannot suppose them to have been very plentiful—and in superintending such repairs and improvements upon the houses of his father and his friends as were needed. At the age of twenty-one he was sent abroad, and travelled for a year or two in England and on the Continent. It was during this period that his bent towards architecture was strengthened and confirmed. He was strongly excited by the great monuments, and is said to have been moved to tears by the grandeur of St. Peter's. He brought home with him a small library of architectural books which he had collected, and pursued his studies at home with renewed ardour, but apparently without much thought of making architecture a profession. There was, indeed, no such profession in the Boston of that day, and probably none in any American city. Boston was then a little town of detached houses, standing in the midst of gardens, with a few public buildings which had been built from the designs of English architects and with a population of about 18,000 inhabitants.

Bulfinch's first work appears to have been the monumental column on Beacon Hill, whose summit, a round, grassy knoll, a little to the north-east of the present State House, and about on a level with the roof of that building, had ever since 1635 been

marked by a beacon, consisting of a tall mast, from the top of which projected a short yard supporting an iron basket or frame, in which tar or other combustibles might be fired as an alarm on the approach of any enemy. The beacon was blown down in 1789 and was replaced during the next year by a memorial column of the Roman Doric order, standing on a pedestal and surmounted by a globe bearing an eagle. The whole height was about 60 feet. The four faces of the pedestal bore tablets of slatestone, with inscriptions commemorating the principal events "which led to the American Revolution and finally secured liberty and independence to the United States." The monument was built of brickwork covered with stucco and was taken down in 1811, when the hill on which it stood was cut down to the level of the adjacent streets; but the tablets are preserved in the Doric Hall of the State House.

It was not long after this beginning that the young architect became engaged in one of those combined architectural and commercial enterprises which are so apt to prove a snare for the too confident projectors. That part of the town which is now covered by the lower part of Franklin Street was in 1790 a swampy pasture, which a year or two later was drained and made a garden by Joseph Barrel, who lived on a neighbouring estate on Summer Street. In 1793 this area came under the control of Mr. Bulfinch and two associates, Mr. William Scollay and Mr. Charles Vaughan, who proceeded, after Mr. Bulfinch's designs, to lay out a street, of which the north side formed a straight line and the south side a crescent, with an enclosed strip of grass in the middle.* On the south side a long range of houses was built, sixteen in number, with the two at each end brought slightly forward as a pavilion, and faced with an order of pilasters, and with a central pavilion of somewhat monumental character at the middle of the curve, through which a street was brought, which took the name of Arch Street. In the grass plot was placed a memorial urn, brought from Italy by Mr. Bulfinch, on whose pedestal was an inscription to the memory of Franklin. All this has long since passed away. Franklin Street has been twice destroyed and twice rebuilt; and it is needless to say the simplicity and architectural character of its original aspect have not been retained.

The enterprise of Mr. Bulfinch and his associates was in advance of the requirements of the little town, and proved commercially disastrous; but what was misfortune to Bulfinch was good luck for Boston, since it was the occasion for his adopting as a serious profession what had heretofore been for the most part the recreation of an amateur. During the next year the Commonwealth acquired the land known as "Hancock's pasture," at the head of Beacon Street, and proceeded with the erection of a new State House from Mr. Bulfinch's designs. The corner-stone was laid on July 4, 1795, by the Governor and the Masonic Grand Master, with imposing ceremonies, the stone having been drawn to the site by fifteen white horses. The building was finished in less than three years, being occupied by the Legislature in January, 1798. The site was not then, as now, the crown of the hill; behind it rose, as we have said above, the round grassy knoll bearing the monumental column erected by Bulfinch five years before. The original design of the State House was different in some respects from the building which was erected, as that was different in some respect from the building we see to-day. Considerations of site and considerations of cost are understood to have compelled certain modifications of the design, of which the shortening of the wings was the most important. Concerning these modifications there is, however, no exact knowledge, as the original drawings have unfortunately not been preserved. They did not seriously affect the integrity of the design, whose noble and simple dignity so well becomes the commanding site.

Such was the auspicious beginning of a professional career extending over a period of half a century. We have no space to follow it in detail. A memorandum in Mr. Bulfinch's handwriting is extant, containing a list of the public and private buildings erected from his designs. They embrace almost every variety of building—court houses, prisons, hospitals, churches, banking and insurance buildings, schoolhouses, dwellings. The first theatre in Boston was built by him as early as 1793, and having been destroyed by fire was rebuilt only five years later. It was on the northerly corner of Federal and Franklin Streets, and was then thought to be the finest theatre in the United States. Its design is preserved on a medal which was struck by the proud and grateful owners, and "Presented by the Proprietors of the Boston Theatre to Charles Bulfinch, Esq., for his unremitted and liberal attention in the plan and execution of that building, the elegance of which is the best evidence of his taste and talents." This was the inscription on the reverse of the medal; on the obverse beneath the façade are the words:—"This medal entitles Charles Bulfinch, Esq., to a seat in the Boston Theatre during

life—benefit nights excepted." The design shows a front with a basement and principal storey, with a projecting centre faced with four Corinthian columns with entablature and pediment. The order is continued across the whole front, and the intervals are occupied by arched windows. The basement is quite plain, with an arched entrance in the centre, flanked by a single square opening on each side. The façade has simplicity and repose, not without a certain festal character expressive of the purpose of the building.

Of the many buildings which were erected by Mr. Bulfinch in Boston and its immediate neighbourhood, very few have withstood the rapid transformation which has converted nearly the whole area of the old town into a commercial district. The Court House, which stood on the site of the present City Hall, the Roman Catholic Cathedral on Franklin Street, opposite the side of the theatre, the Boylston Market, which has disappeared more recently, were examples of the varied lines in which his practice ran. The Massachusetts General Hospital, several of the granite banking and insurance buildings on the north side of State Street, University Hall at Harvard, and doubtless other buildings which it is difficult to trace, yet remain. The last mentioned of them was built originally with an open colonnade or piazza along its western front.

The period of Bulfinch's active life in Boston is mostly comprised between 1793 and 1818. During the whole of this period it is interesting to know that he was prominent not only as a professional man, but as a useful and public-spirited citizen. He was one of the earliest members of the Massachusetts Historical Society, and when the Franklin Street buildings were completed he offered to the Society a room in the central building measuring 27 by 40 feet. The offer was gratefully accepted, "with pleasure at such a donation from gentlemen whose feeling for the public interest and taste for architecture have ornamented the capital with buildings so exceedingly elegant as the Crescent." He was chairman of the Board of selectmen and superintendent of police from 1800 to 1815. When, in the latter year, he, with two other members, failed of re-election, "the circumstance," says Quincy, in his "Municipal History of Boston," "was a subject of very general regret. Every elected member of the Board of Selectmen immediately resigned, and on a second trial Mr. Bulfinch and the others were reinstated by decided majorities."

When, in 1816, Mr. Bulfinch was made the architect of the Massachusetts General Hospital and the Insane Hospital at South Boston, he made visits to other cities, in order to inspect their institutions of a similar character. At Washington he met the president, James Monroe, then just elected, and had some agreeable intercourse with him. The next year, making a tour of the Northern cities to celebrate the "era of good feeling" which his election had ushered in, the President visited Boston, where he was officially received by Bulfinch, as chairman of the selectmen. The pleasant acquaintance of the preceding year was renewed; the President was shown the works of the architect, and the result was the appointment during the next year of Bulfinch as architect of the Capitol of Washington, which had been half burned by the British troops during the war then recently ended. Here Bulfinch was the worthy successor of Hallet, Hadfield, Hoban and Latrobe. He resided for twelve years in Washington in this capacity, returning to Boston in 1830.

He was now sixty-seven years old and had been long absent from the scene of his earlier labours. Yet he took up his practice again, though naturally with less vigour than of old. The only important building which we know as belonging to this later period is the State House of Maine at Augusta, built of granite, and of which the design has much similarity to that of the State House at Boston. Mr. Bulfinch died in 1844 at the age of eighty-one. Mr. Quincy, in the history from which we have already quoted, says of him:—

"Few men deserve to be held in more grateful remembrance by the citizens of Boston than Charles Bulfinch. . . . During the many years he presided over the town government he improved its finances, executed the laws with firmness and was distinguished for gentleness and urbanity of manners and integrity and purity of character."

STREET AND DRAINAGE IMPROVEMENTS IN LEEDS.

WHILE a crowd of smaller but not unimportant matters have occupied the attention of the streets and sewerage committee from time to time, it has been and still is steadily engaged, says the *Leeds Mercury*, in dealing with two of the largest problems that municipal government has to grapple with. A system of street improvements involving a million of expenditure, and half of which has to be dealt with during the next four or five years, is not by any means a small order, and the construction of sewage purification works on the lines of modern requirements for a present population of 400,000 and a

* The original plan was symmetrical, with a curve on each side and an elliptical grass plot, but the projectors found it impracticable to secure the requisite amount of land on the north side.

prospective population of three-quarters of a million, and involving another half million of expenditure, is also one of those questions the dimensions of which a few years ago would have been considered national rather than municipal. In regard to the street improvement question there is every year a number of small improvements forced upon the consideration of the committee by the building operations of the year. Wherever it is proposed to spend money upon a building which already projects into a road, or to build premises abutting upon a road which is too narrow, the streets committee are bound to consider at once what the extent of widening shall be, and to negotiate the compensation to be paid to the owners concerned. During the last year there has been more than usual of this kind of work, and no doubt as Leeds increases there will be more and more. Within the past twelve months there have been thirty-five such improvements, involving a total expenditure of nearly 19,000*l.* in sums varying from 2,400*l.* to 46*l.*, and in one case 15*l.* Each of these items has involved plans, committee meetings, negotiations almost endless, and whose extent is not always in direct ratio with the amount involved, a very small matter often involving greater labour than a larger project. Last, but not least, there is the great fight of each question through the Council, where, out of the total of sixty-four members, only twenty-two, *i.e.* the committee, can be expected to thoroughly understand the case without much explanation and discussion.

Immediately the Leeds Improvement Act, 1893, came into force this year, the streets committee asked the Council for permission to commence the improvements authorised by the Act. After several attempts, abortive partly from the process being novel and partly from the indisposition of a few members of the Council to embark on so large an expenditure, the Council authorised the committee to proceed with the most important of the improvements. These were the widening of North Street, Vicar Lane, Meadow Lane, Park Lane, Burley Street, Burmantofts at its junction with York Road and Marsh Lane, and of Beeston Road at Hunslet Hall Road, the total estimated outlay involved being 194,939*l.* The whole of the necessary notices to owners of property were promptly served. The owners are now sending in their claims and the names of their arbitrators, after which, the Corporation having also nominated their arbitrator, an umpire will in each case be appointed, and there can be no doubt that in the ordinary course of business, and provided other matters are not allowed to take precedence, the whole of the properties involved in these magnificent improvements will be in the hands of the Corporation to work their will upon within the next twelve months. The committee were fortunate in frustrating an effort of the markets committee to get an order of the Council to rebuild, with a nominal rounding off of a corner, the Central Market, which had been destroyed by fire; and, having secured from the Council an instruction to have the whole of the site cleared, they will in March next, when the tenants' notices expire, go forward with the widening of New Market Street and Duncan Street at that point. This is essential to the completion of the widening of those two streets in their whole length between Kirkgate and Briggate, and will prolong the line of widening of North Street and Vicar Lane.

The laying out of new estates by private owners has involved during the year the construction of 13 miles of new sewers, and in addition to this the Corporation have laid at the cost of many thousands of pounds large storm or rainfall sewers in several districts, notably round St. George's Church and down to West Street. They have also laid the large intercepting sewer for the Hunslet and Meadow Lane area, the Cardigan Road and Victoria Road district, and for Headingley Lane, Harehills Road and also Green Road, where rainfall sewers have been laid to prevent the flooding of Beckett Street and Burmantofts, and properties abutting on Green Road.

In regard to the other important question—the purification of the sewage—we understand that the engineer is well advanced with the preparation of his report. The committee have visited the sewage works of some of the largest towns and have there seen the best examples of sewage purification, and a printed pamphlet has just been issued for the use of the Council giving full particulars of these works as well as those of Leeds. During this year special surveys have been made and levels taken along the valley of the Aire for a distance of some seventeen or eighteen miles, with a view to affording information on which to base all the alternative schemes which can possibly be found for dealing with the question. It is quite clear that the fall of the Aire Valley being very slight, any scheme involving a large area of land must of necessity either have its site at a distance of many miles from Leeds, or, if nearer home, must involve pumping operations. A few thousand acres of land and twenty miles of outfall sewer, at 15,000*l.* per mile, add up to such a sum that there can be no doubt that the Council need both time and special wisdom in dealing with this matter. In the meantime they must turn to best account the Knostrop works, which, though far from per-

fect, have done much good service for the last twenty years. The other local authorities concerned and which are now sadly in arrear can be getting into line in the same time. As a means of reducing this big scheme as far as possible advantage is being taken of the fact that lands, very suitable for purification of the sewage of Rodley and Bramley, are to be found abutting on the river, partly in Horsforth and partly within the city and partly in Calverley. Parliamentary powers to take these lands for the purposes named recently came into force, and already plans for the drainage of the district and disposal of the sewage on the land are completed, and the arbitration for the major portion of the land is now proceeding. These works will be commenced within the next few months.

GLASGOW SCHOOL OF ART.

THE first of a series of eight lectures on Mediæval architecture has just been delivered by Mr. Alexander M'Gibbon, in the west room of the Corporation Galleries, granted by permission of the Parks and Galleries Trust. Mr. T. L. Watson, president of the Glasgow Institute of Architects, occupied the chair. After defining his terms and the scope of his subject, the lecturer explained that while Scottish work would be duly examined, he had not thought it advisable to limit attention to what was best derived from the south; the borrowing from England continued almost until the Renaissance, when the indebtedness was transferred to France. He then discussed the widely accepted, but too exclusive, definition of what Gothic as a style is compared with Romanesque; a definition given currency to by too partial admirers of French work and one that would discredit many of the best English examples. It was granted that at various times the initiative in development of style was taken by France, but claimed as a merit in English work, that, at first simply copying, in due time there was an assimilation of the new methods, and a consequent growth of a characteristic phase of the style. The first true English style owning no foreign parentage was the Perpendicular, often most unjustly decried, and its development was intruded upon by the Renaissance; but the life was only repressed, not extinguished, as the Gothic revival of fifty years ago proved, and to-day Gothic as a style lives and will live. In France, however, its glorious course was finally checked by the revival of Classic art, and now it attracts only an archaeological interest. The lecturer then criticised the claims of several to be the exponents of the true spirit of Gothic architecture—the ecclesiologist, who finds in its forms the expression of Church doctrine; writers, such as Mr. William Morris, who approve of Gothic, but at the expense of Renaissance, because of its being the work of free Englishmen and not of the tyrannical Medici, and of Mr. Ruskin, because of its supposed affinity to nature in plant and animal life, and finally, of the practitioner who, without attempt at adaptation and in violation of universal tradition and practice, bodily transfers from other styles. The lecturer then spoke on the legitimate authority he would accord to precedent, and finally on how Mediæval architecture should be studied. Gothic, as the artistic language in which much of our national history had been written, in his opinion, would yet find favour in Greater Britain, and when in Central Africa Scotsmen multiply, there will undoubtedly be required material reminiscences of St. Giles's and Melrose. Throughout the lecture numerous lime-light illustrations were exhibited, and at the close a vote of thanks to the Chairman was moved by Mr. William Forrest Salmon.

ART TUITION.

A LECTURE was delivered on Monday by Professor Herkomer, R.A., at the London Institution, on "Sight and Seeing, or Art Tuition." He said that the subject of art tuition was one which had deeply interested him, and to which he had *con amore* devoted the best part of his life. In no branch of mental training was there more danger in the formation of habits of thought than in art training. On the face of it, the plan of distributing means of education both by art samples and other help to small country towns was a good one, and the idea of getting objects from a central museum on loan was also a good idea; but the schools of art had not been justified by their results during all these years, for the system had grown into an unwieldy piece of machinery under the influence of impersonality. We had now arrived at a time when we must either change the system or abandon it altogether. There should be for each town its staff of masters, one for each branch of art, and when they had selected their masters they must let them be masters. The longer his experience, the more certain was he that the art faculty in any human being was worked by the character. Provided the natural gift was there, its successful use depended on the moral character of the

individual. For that reason the art master must be the student's best friend. He wished to impress upon his hearers the necessity for personality in teaching, which meant seeing deeply into the whole nature of the student. Art tuition should begin with the child at school, for drawing, if properly taught, was bound to help seeing in every child. There must, however, be no mistake in the methods. He was opposed to the work from the antique to which many art students devoted much time, and advised the substitution of life casts. The study from the nude was the great and all-embracing method for ripening the art perceptions which nature had implanted in man, so for that goal every real art student's heart yearned. It was by these means that the student acquired his mastery over technique, and the loss of such exercises in early youth was felt by a painter throughout the rest of his life. The moment any system of training became impersonal, it became stereotyped and lifeless. He recalled with gratitude the advice of an artist who recommended him not to exhibit his first oil-painting. "You will do better next year," he said. He waited until the next year, and then sent in a picture which was hung on the line at the Royal Academy; but it was so like Walker's work that it was mistaken for a picture by Walker. A little later he unconsciously freed himself from this influence and painted the "Chelsea Pensioners;" but when he had finished the picture, he was almost heartbroken because it was so unlike Walker's work. That was an example of the effect which one artist might have on another, but the great thing was for each man to work in accordance with the dictates of his own individuality. Finally, whatever forms of tuition were adopted, the one motive power to make them successful was enthusiasm.

SOCIETY OF ARCHITECTS.

THE annual general meeting of the Society of Architects was held in St. James's Hall on Tuesday, when the various office bearers for the coming year were elected. The proceedings were presided over by Mr. George Highton, the retiring president. Mr. Edwin J. Hamilton, of Brighton, was elected president for the next year; and Mr. Ernest Day, of Worcester, and Mr. Banister Fletcher, of London, were elected vice-presidents, but it was announced that the latter was unable to accept office; Mr. Ellis Marsland was elected hon. secretary, Major Leslie, R.E., corresponding secretary, Mr. H. G. Quartermain, treasurer, and Mr. S. C. Johns, auditor. The following members of Council were also elected:—Messrs. William Allport, C. A. Bassett-Smith, J. W. Frazer, Edgar Farman, Herbert J. Jones, Robert Keith, Henry Lovegrove, W. R. Mallett, G. A. T. Middleton, George Thomas, Edward Tidman and Silvanus Trevail. The chief remaining business before the meeting related to the report of the Council, recommending that a system of examination of candidates for membership of the Society be instituted. The Council, however, suggested that two classes of candidates should be exempted from the examination, where the candidates had reached a certain age and acquired a certain amount of experience. The meeting, which did not number more than fifteen, eight of whom were members of the Council, was much divided in opinion as to the institution of a scheme of examination, and Mr. Seth Smith moved an amendment to the Council's report, that the institution of any examination be postponed, in the hope that the Royal Institute of British Architects would speedily promote legislation for the compulsory examination of all architects, and securing for itself the privilege of being the sole examining body. It appeared that a committee of the Council had sent out a series of questions, asking the 500 members of the Society whether they were in favour of an examination. About sixty replies had been returned, 90 per cent. of which had been in favour of examination. Mr. Hicks described the proposal of the amendment to transfer the examination to the Royal Institute of British Architects as humiliating to the Society, and Mr. Seth Smith, under the pressure of several members, withdrew the reference to the Royal Institute securing for itself the privilege of being the sole examining body. In this modified form it was still objected to.

Mr. Stonor seconded the amendment, which was rejected by eight to five.

Mr. Edgar Farman moved an amendment, which left the Society the power of conducting an examination of its own, but making the examinations of certain educational and other institutions qualifying examinations for membership. The Council accepted this amendment, which was carried by ten to three, and the proceedings then terminated.

Mr. W. H. Bidlake has arranged to give a course of twenty-four lectures at the Wolverhampton Art School during the winter months. The syllabus comprises studies in Egyptian, Assyrian, Persian, Phœnician and Lydian, Greek, Roman, Early Christian, Byzantine, Romanesque, Norman, Early English, Decorated, Perpendicular, French and Italian Gothic, Italian and French Renaissance, and English Renaissance.

GENERAL.

The Royal Institute of British Architects' first general meeting of the session, 1894-95, will be held on Monday, the 5th inst., when the chair will be taken at eight o'clock. Mr. Francis C. Penrose, F.R.S., president, will deliver the opening address of the session.

Mr. Wootton-Isaacson, M.P., has just opened a very popular industrial exhibition in the St. Benet's Hall, Stepney.

The Liverpool Architectural Society will hold their second ordinary meeting on Monday, November 5, when a paper will be read by Mr. E. W. Cox, of the Historic Society of Lancashire and Cheshire, entitled "The Value of Archæology to Architects, as Exemplified by the Ruins of Birkenhead Priory."

Mr. Alexander M'Gibbon has opened a course of lectures on "Mediæval Architecture" in connection with the Glasgow School of Art in the Corporation Galleries.

The Society of Engineers have arranged for the annual dinner to be held at the Holborn Restaurant on Wednesday, the 12th inst.

The General Meeting of the Royal Archæological Institute of Great Britain and Ireland will be held at 20 Hanover Square, W., on Wednesday, November 7, at 4 P.M., when a paper will be read on "English Municipal Heraldry" by Mr. W. H. St. John Hope, M.A.

Mr. S. Maylan, Noel Street, Nottingham, has been appointed surveyor and inspector to the Basford Sanitary Authority, Nottingham, by nineteen votes out of twenty-one. There were ninety-eight applicants for the post.

The Hotel in Prince's Street, Edinburgh, belonging to the North British Railway Company, is to be rebuilt, and plans are to be invited from a limited number of Edinburgh and Glasgow architects.

The Emperor of Germany has given 12,000 marks out of his privy purse as a contribution towards the construction of a theatre in Bromberg.

Mr. A. Loader, of Brighton, has been appointed architect for the new Board School which is to be erected at Shoreham.

Mr. Henry Harben, J.P., a member of the London County Council, has promised to give 4,000*l.* for the purpose of building a convalescent home near the seaside for working-men of Hampstead and Kentish Town.

Plans are in preparation by Messrs. Cunningham, Blyth & Westland, of Edinburgh, for the new Waverley Bridge in that city.

The Action taken by M. Bourgeois, a builder of Lourdes, against M. Zola for defamation of character in a chapter of "Lourdes" will not be tried until December 19.

The Parthenon is in a dangerous state through the earth tremors of this year in Athens, and it has been decided to adopt means to insure its stability.

Mr. J. Charlton's *Balaclava* has been purchased by the Corporation of Blackburn for the new gallery. Mr. Bowdler has presented the Hon. John Collier's *Hetty Sorrel* to the gallery and Mr. Hornby, M.P., a portrait of his brother, Mr. A. N. Hornby.

The Maire of Bayeux has reported to the Academy of Inscriptions that the Bayeux tapestry is decaying.

The Exploration of the tumulus in Parliament Hill Fields, Highgate, was commenced on Monday, under the honorary direction of Mr. C. H. Read.

Colonel G. T. Plunkett, R.E., has been appointed secretary to the Royal College of Science, Dublin, which is one of the institutions of the Science and Art Department.

At the Anniversary meeting of subscribers and governors of the Nottingham General Hospital it was stated that Colonel Seely, M.P., had offered to purchase a large residence known as The Cedars, three miles from Nottingham, and to adapt it for the purpose of a convalescent home in connection with the hospital. Colonel Seely also intimated that he would increase his subscription to the hospital to 200*l.* a year. There are five acres of ground surrounding The Cedars.

The Restoration has been completed of the tower of St. Michael and All Angels Church at Heydour, near Sleaford, at a cost of 500*l.* The work was rendered necessary in consequence of the failure of the foundations, which entailed six months' labour to make the tower safe and restore it to its original condition. Mr. Wm. White, F.S.A., of London, was the architect.

The Duke of Cambridge has signified his willingness to give a piece of ground as the site of a vicarage for Kingston Vale.

The Art Gallery Committee of the city of Manchester have arranged to hold an exhibition of contemporary arts and crafts in the rooms of the City Art Gallery in April next. The intention is to bring together a display of fine examples of industrial art, with a view to educate the public taste and to stimulate the desire for all that is excellent in design and workmanship.

The Architect.

THE WEEK.

AMONG the writers about art in England the late Mr. PHILIP GILBERT HAMERTON held a position that was peculiar. He could paint, draw and etch as well as describe, and, moreover, he was a man of business to whom artistic works were commercial speculations, and therefore reserved the most important part of the arrangements for producing them to himself. Mr. HAMERTON was a native of Lancashire, and was born in 1834. In his twenty-first year he went to Paris to study painting, and remained abroad for a couple of years. He next took up his residence near Loch Awe. His first book was a volume of poems descriptive of the isles of Loch Awe and other northern scenes. One of the mottoes was from GOETHE, "Let no one say that reality lacks poetic interest," and the verse was little more than prose arranged in lines. It was, however, in keeping with the woodcuts, which are very realistic. Mr. HAMERTON was at that time a competent etcher, for he proposed to bring out a volume of a hundred plates to illustrate his verse. Unless we are mistaken Mr. HAMERTON was afterwards a teacher in one of the northern schools of art. In 1861 he took up his residence in Sens, a little city which he afterwards described in a manner that revealed his affection for French life. He worked hard as a painter, and studied the styles of French painters with care. This enabled him to write his "Contemporary French Painters" and "Painting in France after the Decline of Classicism." The *Portfolio* was started in 1873 under his control, and at once exemplified the possibility of employing etching for periodical publications. To the pages Mr. HAMERTON was a constant contributor. His "Graphic Arts" appeared in 1882, and his book on "Landscape" in 1885. For the "Artistes Célèbres" series he wrote a memoir of TURNER, in which he maintained that the painter's superiority was in representing clouds, and that TURNER was as assiduous in studying the works of his predecessors as in studying nature. Mr. HAMERTON rendered excellent service to the graphic arts in this country, and his efforts to make French art and French ways more appreciated in England deserved a higher acknowledgment than the decoration of Officier de l'Académie, which is only a consolation prize for those who are ambitious but feeble.

THE plans for the new meat market in Birmingham prepared by Messrs. ESSEX, NICOL & GOODMAN were submitted to the trade, and various alterations were in consequence suggested. The architects estimated the cost of the works as follows:—Buildings, including gas and water, ventilating and sewerage, 40,000*l.*; gear and permanent fittings, 5,000*l.*; architects' commission and sundries, 3,000*l.*; total, 48,000*l.* As the tenders received were higher in amount, the markets committee decided to have amended plans and drawings prepared by the architects. The principal alterations in the original designs are as follows:—(1) The meat market roof is simplified in construction by making it in one span instead of two, and omitting the central girders and stanchions; the height of the side-walls is reduced from 40 feet to 35 feet from floor-level. (2) The height of the basement for the cold stores extending under the meat market is reduced to 13 feet. (3) A rearrangement of the buildings next the Gullet is made by which a considerable expenditure on foundations and excavations is avoided. (4) The tower is reduced from 145 feet to 120 feet in height. (5) The screen walls enclosing the ends of the yards from the streets are reduced to about 20 feet in height. (6) Some of the terra-cotta embellishments are omitted in the elevations, and also the glazed brickwork in the subway. (7) In addition to the above items there are a number of minor variations which also do not affect the efficiency of the buildings. With the foregoing alterations, the total cost of the work, based on Mr. JOHN BOWEN's schedule of prices, will amount to 49,375*l.*, to which the committee have added 625*l.* for contingencies, bringing up the cost of the buildings and fittings to 50,000*l.*, making, with the architects' commission and sundries, a total of 53,000*l.* The committee recommend the Council to approve of the proposed alterations in the

plans and to authorise them to have the work carried out in accordance therewith at an additional cost of 5,000*l.*; also to instruct the finance committee to borrow that amount.

THE difference between a drain and a sewer is not always easy of comprehension. In the Metropolis Management Act, 1855, the word drain is taken to "mean and include any drain of and used for the drainage of one building only, or premises within the same curtilage, and made merely for the purpose of communicating with a cess-pool or other like receptacle for drainage, or with a sewer into which the drainage of two or more buildings or premises occupied by different persons is conveyed, and shall also include any drain for draining any group or block of houses by a combined operation under the order of any vestry or district board." But in many clauses of the Act sewer is used as equivalent to drain. A decision just given in the Courts shows that the order of a vestry or a board is not indispensable in order to recover outlay on drains. In the parish of St. Leonard, Shoreditch, are two blocks of model dwellings known as Norfolk Buildings, separated by a causeway 20 feet wide. The drains were laid in 1882. A notice was served on the owner in November 1892, requiring the drains to be reconstructed. As the work was not executed at the prescribed time, the Vestry expended 20*g.* 7*s.* 6*d.* upon it. The owner declined to pay on the ground that the drains formed a sewer, and that originally they were not laid down under the order of the vestry. Mr. ROSE, the magistrate, decided that a main drain, draining blocks of houses by a combined operation, was, under the circumstances, and notwithstanding the absence of any order of the vestry, a drain and not a sewer within the meaning of the Act. The owner appealed, and the arguments were heard on the 1st inst. Mr. Justice MATHEW held that the magistrate was right, as the drain in question was not a sewer within the meaning of the Statute. The causeway was within the curtilage of both buildings, and therefore the appellant was liable to execute the works. In that opinion Mr. Justice CHARLES concurred. The appeal was accordingly dismissed with costs.

THE progress of Mr. REGINALD BARRATT as a draughtsman in black and white has been remarkable, but few could have realised that he possessed so delicate an aptitude for colour as is visible in the drawings from Egypt, India and Italy which are to be seen in the Fine Art Society's room in Bond Street. That Mr. BARRATT can draw architecture with understanding does not need saying; but the use of colour has enabled him to suggest the character of the buildings with surprising fidelity and pictorial effect. The collection forms one of the most interesting "one man" exhibitions which are now to be seen in London, and should attract all who can appreciate excellent work.

ANOTHER prominent architect and one of the best types of the citizen soldier has been lost to the country by the sudden death of Mr. CHARLES GEORGE HOOD KINNEAR, A.R.S.A., in Edinburgh, on Monday evening. He was in his sixty-fourth year, but from his fine martial appearance it might be supposed he was a much younger man. Mr. KINNEAR received his training in DANIEL BRYCE's office in Edinburgh, where opportunities were offered for becoming acquainted with many varieties of building. He practised for a time on his own account, and then he entered into partnership with the late Mr. DICK PEDDIE, afterwards a member of Parliament. The firm of PEDDIE & KINNEAR soon acquired a reputation throughout Scotland and upheld it for many years. Afterwards the title was changed into KINNEAR & PEDDIE, when a son of the former senior partner entered into the firm. In Edinburgh a great many buildings were designed by the partners as well as country houses in all parts of Scotland. Illustrations of some of their buildings have appeared in *The Architect*. In 1859 Mr. KINNEAR joined the Mid-Lothian Coast Artillery as a gunner, and in a year he received a commission in a grenadier company. He was promoted from time to time until 1884, when he succeeded to the command of the regiment. Since then his zeal and liberality have done much to insure its efficiency. Colonel KINNEAR's loss will therefore be felt in many circles of the north.

ROSSO DEL ROSSO.

IN the article on BENVENUTO CELLINI which we published lately (*The Architect*, Oct. 19, 1894), we described some of the troubles which beset FRANCIS I. in his efforts to introduce Italian art in France. There seemed to be a sort of fatality about the experiment which would have daunted kings no less brave. LEONARDO DA VINCI had hardly arrived in France before he died. ANDREA DEL SARTO made off with the money that was entrusted to him for the purchase of works of art. MICHEL ANGELO refused to leave Italy. How many other artists caused inconvenience to FRANCIS I. is never likely to be revealed. His anxiety to import painters and sculptors was known in every atelier in Italy, and it is probable that more men proffered their services and received travelling expenses than the chronicles relate. An anecdote which VASARI supplies about GIOVANNI BATTISTA DEL ROSSO, known afterwards as Maitre Roux, suggests that in the sixteenth century France was looked upon as a sort of Promised Land by the Italians. Rosso, we are told, used to express a hope that he might end his days in France in order to be free from the poverty and misfortunes which oppressed men who were doomed to live in Florence or elsewhere in Italy. With a view to his residence in France he began to learn Latin, in order to have a means of communication with the natives and to appear learned. He was not aware that about the same period the wandering ERASMUS was unable to meet with three people in France and Germany who were able to use that language in conversation. An accident hastened Rosso's departure before his linguistic powers were perfected. He attended the tenebræ service with one of his pupils on the evening of Holy Thursday in a church near Arezzo. When, according to custom, the lights were extinguished, and the people engaged in silent prayer, the youth let off fireworks, which caused consternation. Some of the religious scolded and beat him, as he deserved. Rosso interfered. The people were excited, and treated the painter as the culprit. He fled from the town and country, leaving a work unfinished for which he had been partly paid, and regardless of the consequences to a friend who had become security for its completion. He made his way to France, where he was at once welcomed by the king, who assigned him a pension of 400 crowns, with a residence in Paris. His arrival was about the year 1532.

At the time Rosso could not be said to have possessed a European reputation. VASARI endows him with talents which would not be inferred from the character of the few works by him that have survived. He was a Florentine, and all that is known of his early years is that, like many of his contemporaries, he practised drawing by copying MICHEL ANGELO's *Battle of Pisa*. From the description of his paintings he would appear to have been most successful when painting children as supporters of heraldic shields. His manner of working was novel, for he generally made the faces ugly, and by degrees imparted to them a pleasing appearance. The amount of success he obtained in Florence was not to be won when he visited Rome. VASARI has to admit the failure. That he was self-reliant is evident when we find that his biographer was unable to discover the names of any painters who gave him instruction in art. We may assume him to have been self-taught, and accordingly he was not faithful to any style. The laxity of his æsthetic principles is also apparent when we find him mixing sacred and profane incidents in the same picture without any notion of their incongruity.

FRANCIS I. did not hesitate about placing the decoration of Fontainebleau under the control of Rosso. He began with the grand gallery. He employed decoration in a sort of stucco on a grand scale, some of the figures being life-size. The panels he filled with representations of the life of ALEXANDER THE GREAT. Rosso was not a modeller, and the work was executed by other artists from his designs. The number of painters and sculptors employed under the direction of Rosso and PRIMATICCIO was very large. The names have survived of BELIN, called MODENA PELLEGRINI, RENAUDIN, LUC ROMAIN, MINIATI of Florence, RUGGIERI of Bologna, JOHN of Bagnacavallo, SAMSON, PENNI, BALDOVIN, DUBREUIL, JEAN and VIRGIL BURON, CACHETEMIER, CARMOIS, CHARLES and THOMAS DORIGNY,

FANTOSE GERARD, FRANCIS, JEAN and LOUIS LÉRAMBERT, SIMON LEROI, ROCHELET MUSMER, LEMOINE, POMETART, SAILLANT, GIROUX, JACQUIO. Judging by their names, Germans, Flemings and Italians as well as Frenchmen were engaged in the first half of the sixteenth century at Fontainebleau as painters or sculptors. The men who are named were competent artists; the inferior ranks are not recorded. According to tradition Rosso assumed the airs of a superior being among his fellow artists. As for the natives, such as FRANCIS OF ORLEANS, SIMON OF PARIS, CLAUDE OF TROYES and LAURENT OF PICARDY, he treated them with disdain. There was a curious similarity of manner between Rosso and CELLINI; both were swaggering Italians, who believed that audacity could become a substitute for genius. Rosso apparently was fond of producing figures that went beyond MICHEL ANGELO's in their muscularity, and he demanded more respect for them and for himself than the great Florentine would have cared to seek. In the mind of FRANCIS I. there were some vague recollections of MICHEL ANGELO's work in Florence, which was recalled by Rosso's exaggerations; but the king was not endowed with sufficient critical power to discriminate between the originals and the imitations. Rosso's work for a time left traces on French art which were not advantageous, but happily they were counteracted by the influence of the work of PRIMATICCIO and NICOLÒ DELL' ABBATE, who of all the Italian artists were the most beneficial to France.

It is now impossible to judge of the merit of Rosso's work at Fontainebleau. PRIMATICCIO is supposed to have destroyed or concealed the greater part of it, and if the paintings bore any resemblance to the scripture piece bearing Rosso's name which is in the Louvre, it would be difficult to discover a style less adapted to the decoration of a summer residence. His time was not entirely occupied with wall paintings. He designed gold and silver plate and jewellery. When, in 1539, CHARLES V. visited Paris, the decoration or architectural scenery was carried out under Rosso's direction, and his love of the colossal would have its use on such an occasion.

His rewards were magnificent. He was endowed with a canonry which yielded wealth. His income from the king rose to a thousand crowns. According to VASARI he lived as a prince rather than as an artist. He possessed numerous servants, a stud of horses, a house that was filled with valuable possessions. Rosso became a grand seigneur. But he was not destined to enjoy his possessions for many years. Some money was stolen, and he accused his associate FRANCESCO DE PELLEGRINO of the theft. The courts were eager to assist the king's favourite, and the Florentine was tortured. But no confession was wrung from him, and he was therefore liberated. It was natural for FRANCESCO to seek revenge, and Rosso may have felt his life was forfeited. He preferred, however, to become his own executioner, and by poisoning himself he escaped the wild justice of his former friend.

NOTES ON THE GREAT RAILWAY STATIONS OF LONDON.—II.

[BY A CORRESPONDENT.]

PROCEEDING with the comments on the interior of the Great Northern Terminus, King's Cross, though, like the exterior, it is plain, there is a solidity and strength in the general construction which is impressive. The proportions, too, are good, and the considerable length with the far perspective of bold deep arched ribs (flanges of each forming a truss) is very effective, much more so than the cheaper plan adopted in roofs of less span, with their numerous tie rods, &c., of small diameter. It has been before remarked that this station is in two spans of equal width, separated by substantial though plain semicircular arches carried on solid piers, three of the latter being much longer than the others, and one of the archways panelled where extra strength seemed to be required. It is a great relief to the eye to gaze upon all this mass of honest stock brickwork after looking at little but iron construction elsewhere in the building. The appearance of this station is

monotonous as compared with the Paddington one with its transept-wise roofs, but it has the advantage in the satisfactory longitudinal bond in the substructure which the wide piers and arcade afford. There is also one feature which is superior to that of several stations, viz. the unbroken expanse of glazing in the highest central part of the roof, which has a much better appearance than intermediate long lengths of wood panelling. This soon gets obscured by smoke and steam and gives a heavy depressing appearance. When the writer examined the station a short time since the roofs were being cleaned and repainted without the use of scaffolding, as a movable timber stage made to fit to the section of this big roof, of sufficient width to hold the painters, was employed. This seemed a clever contrivance for a terminus having such an enormous traffic during the greater part of the twenty-four hours.

There has been an addition made during the last two years that the original builders could never have foreseen, but which must be an immense convenience to travellers and the railway officials, considering the great length of the station. This is the broad iron bridge, naturally erected at as low an elevation as possible, which crosses the terminus about mid-way. It has been designed to have the maximum of strength with as few intermediate supports as possible. Therefore the lattice girder principle has been adopted, which has the double advantage of serving as a balustrade (though rather a lofty one), and carrying the iron stirrups on which the pathway is hung. Useful as this bridge must be, it is architecturally detrimental to the appearance of the station, as can be readily imagined, and seems out of scale and harmony with the surroundings. It, moreover, looks uncomfortable to see nothing under the pathway itself in the way of support beyond the thickness of the stirrups, though as a matter of fact the strength is redundant. The manner in which the "collapsible" sliding-gates on the bridge leading down to the several platforms are so quickly worked, locked and unlocked by the attendant guards at the proper moments is very ingenious. Everything has been done by the present directors to save time and trouble to the passengers, &c., in a manner which would astonish the originators of this station, of whom probably scarcely one now survives.

The Euston Station of the London and North-Western Railway covers an enormous area, but the promoters started with a very grand scheme, of which the only features properly carried out are the great Doric entrance to the station yard and the fine central hall, to which possibly could be added the two lofty booking-offices on either side of the latter, well lighted by small glass domes, but in other respects calling for no particular remark. The station proper is commonplace, and those large extensions made since it was first built, to meet the exigencies of the constantly-growing traffic, are very utilitarian. The central hall takes up a lot of room, and must be in the nature of a "white elephant," being much larger than is necessary for its purpose—so much so that the writer was informed on excellent authority that the directors have actually had it under contemplation to do away with this noble apartment, as well as the booking-offices on either side, but mercifully, as far as Art is concerned, gave up the idea, for the present at any rate. There is nothing very new to be said about this much-admired feature at Euston. Its proportions are of course good, and the treatment of the gallery at the first-floor level of the station offices (which extends all round the hall) is effective, the cantilevers here being much better managed than at the booking-office at King's Cross. Then there is the colossal statue of the great engineer, GEORGE STEPHENSON, very appropriately placed here, and the grand staircase, with its double flight to start with, which looks as if it ought to be used by passengers, but of course is not. In the landing above, the yellow glass to the skylight gives the theatrical effect like that to be seen at the cenotaph of the Princess CHARLOTTE at St. George's Chapel, Windsor. The exterior of the hall is practically invisible, as far as the general public is concerned. As has been remarked, there is nothing particular to comment upon in the station after what has just been described. The covered yard for vehicles is of the ordinary description. The south elevation, with the big Doric entrance, has various stuccoed offices and other buildings; the west side is of plain stock brick with a

series of gables facing the street, possessing no architectural character whatever, and the east side of the station consists of only a brick wall, having semicircular arched openings in the upper part, the roof with its numerous gables towards Seymour Street appearing above. Until one has walked right across the whole breadth of this station step by step it is not easy to realise its immense width, being subdivided into so many aisles, and it is extremely difficult to see from side to side. The height up to the springing of the roofs is not great, and the general impression of this terminus is that of lowness. The history of the enlargement of the building resembles that at Waterloo, as the original central part has been extended on either side, and not only on one side like at Paddington and Liverpool Street. The old station is covered by span roofs of the ordinary description with tie rods, &c., and had the aisles been of greater width some distortion must have occurred, as a considerable part is on a curved plan. It has been found necessary to build a very plain-looking bridge over the west part, which is by no means an improvement to the *ensemble*. It is to be regretted that this terminus could not have been enlarged on a more methodical principle, like, for instance, the Great Eastern station at Liverpool Street has been (to be commented upon further on). The writer has endeavoured to thus briefly give a general description of the Euston terminus, but it is difficult to compress when touching upon so very large a building.

The terminus at Waterloo forms such a peculiar aggregation with its original central station and its large north and south annexes, and is so out of the common in its external and internal arrangements that it is really not easy to say where it begins and ends, owing to the many "ins and outs." The writer has attempted to walk all round but retired discomfited, as the task proved too difficult and moreover "the game was not worth the candle," for no good views can be obtained anywhere. Architecturally it may fairly be said this station has no exterior, except possibly towards the Waterloo Road, but this is of the most commonplace description, even the south station (which is badly discounted by two railway viaducts adjoining it) only comprising a large and wide carriage-porch carrying a superstructure on iron columns and brackets of an ornamental character of the usual type. On mounting the staircase up to the station beyond a similar remark can be made. But it has at least the negative merit of having no pretension or affectation about it. The central station possesses in its narrow end towards Waterloo Junction a survival of that mixture of timber and iron roof construction, with wood tie-beams, which it is believed is now unique in London as far as respects a passenger station. But this is only a very small bit after all of this huge terminus, and one wonders how many of the thousands of travellers have noticed it. So soon as the central station widens the ordinary iron tie-rod construction is employed with span roofs, and being on a curved ground plan the perspective effect is all the better. But the north station, a later addition, is quite differently built in two spans, so to speak, having strong lattice girders transversely and longitudinally, with ridge and furrow roofs of small span carried on girders. But a peculiar and rather effective feature consists in the manner in which diagonal curved iron braces are employed in each bay of the roof, which is unique so far as the writer is aware. Their appearance is somewhat injured owing to the girders which carry what is here an important feature—the gutters—coming so close above these arched braces. If this section of the terminus had boasted rather more height it would have been advantageous; but the total height is greater than that of the older central station. The iron stanchions or piers between the two spanned roofs of this particular part of the station are so planned as to come in between the lines of rail. This is more convenient than their resting on a platform, as is the case at the London, Chatham and Dover (Victoria) Station. Though there is nothing but what is of the most ordinary type in the exterior of the terminus next York Road, the directors deserve a word of thanks from the public for the tasteful way in which they have planted the embankment of a large siding, making it an ornament and something pleasant to look upon from the adjoining streets. To conclude the notice of this enormous station, its growth

has been forced on by an increase in the traffic which the original directors could never have possibly foreseen, and it would be manifestly unfair to saddle upon their successors any blame for the necessary makeshift manner in which the additions have been obliged to be undertaken from time to time.

It is indeed difficult to picture anything more hideous than the "façades" of the two important stations at Victoria, ranged side by side. But many Londoners, though of artistic taste, have got so accustomed to this monstrosity that they do not realise how others, such as foreigners, regard it. There has not been the slightest attempt on the part of the railway "powers-that-be" to make either of these stations worthy of the fine situation they occupy. Are they blind? Yet the Chatham and Dover terminus, except for the Charing Cross Station, is one of the greatest points of arrival and departure for our Continental visitors, who must marvel at our English taste, or rather want of taste. Take first the Chatham and Dover Station of the two neighbours, which, like many others, is two-aisled, but in this instance the northernmost wing is longer than the other one, and stands somewhat in front of it, and the intermediate space on the splay plan is all occupied by a mixed mass of temporary-looking sheds, guiltless of the remotest idea of being architecturally designed, while ugly staring label-boards are fixed up in the most conspicuous positions. No attempt whatever has been made to embellish the ends of the big station roof behind, which stands up in its naked simplicity. To be fair, it is believed these various erections were originally considered to be only temporary. But, however, there they stand unaltered up to the present day, doubtless owing to monetary reasons about which the directors know more than the writer of these lines. One regrets that the Grosvenor Hotel had not been built, at the onset, in front of the ends of one or both these stations, as at Charing Cross, Cannon Street and St. Pancras, instead of at the side. Further, the yard in front of the booking-offices, with its high wood palings and the accumulation of omnibuses and cabs, combine to make a regular jumble. In truth, the whole of these station buildings look as if planted down anyhow, like the streets of some of the towns in North Wales—Dolgelly, for example. Externally the buildings next Wilton Street are of a commonplace character. The booking-office of the main line is fairly lofty, having a coved ceiling with a skylight of domical construction. Looking at the interior of the station itself there is not much in the roofs beyond the usual type. The height up to the wall-plate is less than at Charing Cross and Cannon Street, but there is the advantage of a good well-defined cornice line, which it will be noticed is conspicuous in its absence in some of the larger stations. On the other hand, the cambered iron ties with numerous suspension rods and other constructional ironwork above are certainly not elegant. The purlines are on the lattice-girder principle. The filled-in ornament to the spandrels of the arcade between the two divisions of this station is of a commonplace description, and the columns carrying them, which come in the middle of a not too wide platform, appear to be somewhat in the way.

(To be continued.)

SCOTTISH WATER-COLOUR PAINTERS.

THE annual dinner of the Royal Scottish Society of Painters in Water-Colours was held on the 1st inst. Sir Francis Powell, president of the Society, was in the chair.

Mr. Fleming proposed the toast of "The Royal Scottish Society of Painters in Water-Colours." Having mentioned that the Society had been in existence for seventeen years, he said they were all much indebted to it for what it had done. Twenty-five years ago water-colour painting was scarcely known as a branch of national art in Scotland. The Society had exercised a stimulating and encouraging influence upon our young artists, with the result that there had developed in Scotland a school of water-colour painting which in some respects, he believed, was not surpassed by any water-colour society in the three kingdoms. The products of the Society were purely Scottish. They had a charm peculiarly connected with themselves. They were executed by Scotchmen, they were on Scottish soil, and they somehow had got somewhat of the very atmosphere of Scotland in them. Another thing about the Society was its exhibitions. They were good for the

members themselves, for it was in them they could see the work of their neighbours. Possibly the first effect was somewhat to humble them. Sometimes, however, this was a good thing—where it made the artist go away stimulated and encouraged to put more energy, and at the same time more patience into his work as the outcome of the visit. We lived in an atmosphere of education. It was everywhere. Especially now there was higher education. His experience of education had been got in connection with the School Board. He often thought that exhibitions such as that one exercised a far more powerful influence on public taste than they were apt to recognise. He was inclined to envy the population of a town which perhaps had better opportunities of visiting exhibitions. Possibly the public of Glasgow did not recognise the Society as much as they ought to do. It was impossible to forget that the highest lady in the realm had recognised it by giving it a royal charter and the President the honour of a knighthood. Had Sir Francis Powell lived in the days of chivalry he would have been one of the foremost knights. The Society, as he had said, had only been in existence for seventeen years. Comparatively short though the time was, some of the best of the members had passed away. But there was some of their work now on the walls of the exhibition. He fancied that could they have visited the Fine Art Institute that night they would not have desired anything better than to be acknowledged by the members of the Society. He trusted that the exhibition would be in every way a success. So far as he had heard or been able to see, it was essentially a success in the highest sense of the word—that was, in its art relation. It was to be hoped that the public would appreciate it, and that they would visit it at least once. He was sure that if they did so they would come again. The exhibition had been indebted to one or two gentlemen in particular, whose names he would specially mention. There was the former president of the Society, Dr. Blatherwick. Then it was impossible to forget the chairman, Sir Francis Powell. He was always ready, sometimes at great sacrifice to himself, to do what he could to help the Society forward in every shape or form. There could not be the slightest doubt that the high position which the Society had attained was largely due to the influence and energy which Sir Francis Powell had exerted.

Sir Francis Powell, in replying, said that for himself and on behalf of his colleagues he thanked them for their warm response to the toast Mr. Fleming had proposed in such generous terms to the Society, and in much too flattering expressions regarding himself. He was deeply sensible of the honour conferred by his colleagues in their continued confidence in his presidency, and of the dignity bestowed by Her Majesty, to merit which was his earnest endeavour. But there were other members of the Society who had done excellent work who deserved recognition. Besides the gratitude they owed to the Council and committee of arrangement, he might venture to mention their honorary treasurer, Mr. Brown, whose indefatigable energy had been invaluable. Neither must they forget their active secretary, Mr. Robb. The service he had rendered to the Society was far beyond his official duty. Mr. Fleming had kindly said that the exhibition was the 'high-water mark.' He hoped it was. It was also their high tide. He thought the exhibition presented features different from any previously held by the Society, for not only had they pictures by honorary members and outsiders, but they had also, thanks to the generous aid of friends, patrons and the fine art committee of the city magistrates, been enabled to exhibit pictures by deceased members, and some charming examples of the early masters of the art—viz. Turner, Cox, De Wint and Barret. The Society was catholic, favouring no school or style in particular, and in viewing the gallery they might see side by side the impressionist and the classic, the realist in juxtaposition to the romanticist. The exhibition presented a larger field for study than any they had had. To him it was most interesting and instructive to see the various styles and methods of the men past and present, though it must always be borne in mind that the loan and old pictures were selected specimens from the work of an artist's lifetime, whereas the others represented the year's efforts without much restraint. It seemed to him that where the better present men had advanced was in the decrease of a certain hardness, or tightness, to use a professional expression, and there was also a fuller richness of colour apparent and more realism. The exhibition also had another very marked feature, which was the excellent and beautiful drawings by their new honorary members, which shed quite a lustre around; and also there were some by their old *confrères*, which brought to them quite the light of other days. He thought it was pleasant to see these pictures side by side with their own; it was quite a treat to have them, they were like old friends come back again, and they appreciated it most thoroughly. There was another point in the exhibition; they saw the advance somewhat that had been made in many technical points of water-colour. No doubt a greater experience of the medium and its resources had led to this, for though the oldest form of painting—its birth

had been unrecorded in the most ancient history—yet its development until its initiation in England some century ago had been dormant, and to Britain had been reserved the proud distinction of revivifying this most beautiful art, in which they were now pre-eminent. No Frenchman, no German, no Italian, no Spaniard had excelled our best men, and though in oils our laurels were disputed, in water-colour painting the crown was ours. It should be the pride of every Briton to foster and encourage this national art in which we were at present so unrivalled and which was so replete with charms, for where could they get such pure, such beautiful, such brilliant colour as by a wash of pigment over pure, good paper? Try to match it in oils and their efforts would seem dull and heavy in comparison with the luminosity of the older medium. And besides, where could they get such atmosphere in a picture in any other medium as they could in water-colour? Sir Charles Robinson said that water-colour painting was the essential and most perfect vehicle for the expression of the great school of English landscape-painting, and he believed that as taste became cultured water-colour would year by year be felt and proved to be the most lovely and refined process of rendering the artist's impressions of nature and of beauty.

ROMAN REMAINS IN BERKSHIRE.

THE Reading Museum has been lately enriched by several additions to the collection of remains found at Silchester. An explanation of them was lately given by Dr. Stevens, the hon. curator, to members of the Berks Archaeological Society and others. He said that the cases contained many things which were more British than Roman, although they were called Romano-British. Although the Romans subdued Britain and were associated with the country—their legions occupying various districts and there being intermarriages between the Romans and the Britons, and settlements therefrom to some extent taking place—it should not be considered that they colonised the country in the way that we had colonised Australia or America in the present day. He described the character of the different animals remains of which are to be found in the museum, particularly pointing out that the skull of the dog represented such animals as are to be seen on Roman Samian ware. He also pointed out that some of the bones and tines from the horns of the stag, such as are in the museum, were made into knife handles, guards, spindle-whorls and other articles used in daily life by the Romano-Britons. Dr. Stevens next stated that though some flint implements had been found at Silchester they could not be Roman in their origin. He exhibited some specimens which had been used as strike-lights, after the manner of the strike-lights used at the beginning of this century. To illustrate that these were strike-lights, a similar form of flint implement, found on the Hampshire hills, was exhibited together with a piece of iron pyrites which, containing sulphur, produced fire when struck with the flake. The material used to cause the ignition was dried puff-balls of fungus, such as may be found on the downs. Dr. Stevens also said it could be demonstrated with regard to the Britons that they had precedence of the Romans in the use of the clay found on the coast of Norfolk, known as Kimmeridge clay. The clay when dry was turned on the lathe by the Romano-British people into various objects, such as bracelets, spindle-whorls, small vessels used at the table, toilet objects, small trays, &c. Long, however, anterior to the coming of the Romans the Britons used the same clay, together with jet, which was another material employed by the Romans to make small personal ornaments, some of which had been found in their homes and burial-places; indeed, if the common Romano-British pottery found throughout England were examined it would be found that some of the vessels were ornamented with British designs, while on other pots made with the same kind of material Roman designs, such as an elegant scroll, would be seen. Vessels of this nature were pointed out, after which specimens of some of the rarer pottery to be found throughout England were exhibited—pottery which was manufactured at Broseley from clay obtained in the Severn valley, and containing such designs as are to be seen on the finer Samian ware, which was strictly of Roman production and therefore called imitation Samian ware. This fact, Dr. Stevens pointed out, showed that the Romans in their art went even beyond their own date, the moulding of some of the vessels of their finer Samian ware being of Greek origin. Sundry other articles in illustration of British and Roman art were then passed in review, and the demonstration terminated with a description of the methods by which the Romanised Britons prepared their corn for bread-making. The first illustration was found at Silchester, which was essentially a hand-nealer of British origin. It was a large pebble for the hand and was used with a sandstone basin after the manner of the present mortar. The next method of preparing corn was similar to that mentioned in the Scriptures, where it

was stated that two women shall be grinding at the mill and one shall be taken and the other left. This method consisted of a concave stone which worked on a convex under-stone. A hole in the top admitted the grain, and the top stone being turned by a handle the grain came out of the sides on a cloth. It could be readily seen that from this simple apparatus all the after methods of meal grinding proceeded, for if to a heavier pair of grinding-stones a shaft were added the turning could be carried on by means of a handle after the manner of the common grindstone, or by multiplying the power by means of wheels, and adding sails or a wheel at the end of the shaft a simple form of windmill or watermill might be obtained. During the demonstration two British coins of rude character were exhibited which, Dr. Stevens remarked, were to be attributed to British rather than Roman times.

A vote of thanks was passed to Dr. Stevens.

Dr. Stevens, in replying, intimated that he was about to give up the more arduous part of his duties as curator. He had found the rooms empty, and had brought the collection to its present condition. The museum was collectively of great scientific value, and he believed it was appreciated.

SAFETY OF HIGH BUILDINGS.*

SEVEN hundred and fifty years ago a little knot of architects were busy with the solution of a new problem. All of them had been educated under the same conditions, had been taught the same rules, had copied the same models and studied the same methods of construction. Now, to all of them, almost simultaneously, had been presented a new set of conditions which must be fulfilled, but in the fulfilment of which the models upon which their instruction had been based gave them little assistance. Those models expressed by their thick walls, heavy piers, horizontal lines, and small, round-arched openings, solidity, calm, dignified seclusion and aristocratic sanctity; and now had suddenly arisen in the community a fever of revolt against aristocratic and sacerdotal exclusiveness, a passion of democratic feeling, to which the narrowness and heaviness of Benedictine architecture were intolerable. Everywhere was heard the demand for air, space and light, for vast, bright, open halls, in place of the gloomy monastic churches in which the laity, for five centuries, had been permitted only to listen, from behind a screen, to the prayers of those holy persons whom alone the Saviour of mankind permitted to approach His altar. In one word, the modern spirit had been born and upon a few men had fallen the task of expressing it in architecture. You all know how they acquitted themselves of this duty; how, starting with the necessity before them of providing vast and lofty buildings with slenderer supports and larger windows than had ever been seen before, they not only completely satisfied these requirements, but almost within one man's lifetime developed a style of architecture absolutely new, even to its smallest detail, and in this style produced buildings which, speaking to architects trained to appreciate many sorts of architectural beauty, I will not call the most beautiful in the world, but which may be justly described as the most interesting in the world, through the richness of artistic feeling which shows itself everywhere in them.

A comparison of the last decade of the nineteenth century with the era of the emancipation of the communes may seem historically unwarranted, but architecturally there are some striking points of similarity. With us, as with the people of Paris and Amiens and Rouen toward the end of the twelfth century, buildings of the sort that our grandfathers erected no longer serve our purposes. It is true that we can use their dwelling-houses comfortably enough, but for the occupations and amusements which we carry on in common with other people we need, and must have, stronger, lighter, more wholesome and more enduring structures than any known to our forefathers. An economy of time must be practised to the utmost in our modern system, each sort of business must be as far as possible localised, and this involves collecting near a given spot as many persons whose interests are connected with that locality as can safely be accommodated, this requirement alone bringing us inevitably to the modern high building, with its many storeys and its swift-running elevators, standing upon a lot whose situation alone gives it fabulous value.

Notwithstanding all that has been said in ridicule of the "sky-scrapers," there is no doubt that these high buildings meet a need that has been urgently felt, and will continue to be felt more and more in our large cities, and, however conservative we may be in our notions of the virtues of six storeys of solid wall, we all know that the buildings that the age requires, standing on land worth two hundred dollars a square foot, must be made with protected metallic skeletons, and we have probably prepared ourselves by earnest study of the

* A paper by Mr. T. M. Clark, read before the American Institute of Architects at their Twenty-eighth Annual Convention.

subject to make the best of the new construction, whether it appeals to our artistic sympathies or not. That it should at once appeal to our artistic sympathies is not particularly to be desired. The people who cast off the old love with most alacrity are not those who gain the firmest hold on the affections of the new one, and a regard, based on an appreciation of the many excellent qualities of the new architecture, will be the best foundation for an esteem which we may hope will hereafter find artistic expression.

Among these excellent qualities the greatest ought to be, and will be, if architects choose to have it so, the security of the modern high building against fire. As a rule, fire-engineers are disposed to condemn those already erected, for the reason that they are so lofty that streams of water cannot be thrown into them, and so incautiously built, in many cases, as to present an immense mass of fuel in a condition for burning comparable with that of a pile of kindlings built up in a chimney. And they are certainly justified in their criticism; but there is no necessity for filling these blast-furnaces with woodwork, and where the architect is allowed to apply his knowledge, it is easy to make the protected skeleton of fifteen or twenty storeys not only safe against injury by fire within, but extremely valuable as a bulwark against the course of conflagrations outside it. In the presence of so many of my brethren much better qualified than myself to treat of the details of the new construction, I will not presume to point out the methods which architects should follow in carrying out designs of the sort here considered, but it will do no harm to suggest certain possibilities, in the way of application of materials, which may contribute in new ways to the diminution of the fire-hazard. It is well understood by architects that no building, however constructed, is safe against fire unless the amount of combustible material contained in it is either very small, or is divided into small portions by incombustible partitions; and it is also well known that a building, very safe against internal hazards, may be destroyed by the attack of a fierce conflagration from the outside. Great as has been the progress in the art of incombustible construction within the last ten years, there is still much that can be done with materials already at hand in fortifying our lofty buildings against both internal and external risks. Where the fireproof building of ten years ago had its partitions set with wooden studs, filled in with blocks of hollow plaster or porous terra-cotta, and its wooden doors and windows trimmed with wooden architraves, the modern structure is divided by partitions of cement, on metallic lath, held by uprights of channel or angle iron, or of wrought-iron pipe, and, in many cases, provides iron frames and casings for its doors and windows; and the fireproof building of the future will undoubtedly add to these either doors entirely of metal and glass, such as are made in Germany and occasionally here, or of wood covered with sheet metal, in the manner recently introduced, which gives a light, handsome and perfectly incombustible door at a very small expense.

With marble floors on concrete or terra-cotta arches between iron beams, plenty of partitions of iron and cement, metal-covered doors and windows hung in iron frames, and bases and wainscoting either of marble or of metal-cased wood, the internal hazard of the high fireproof building can be reduced to almost nothing, as a fire in one room could not spread to the next. There is, however, the external hazard still to provide for, and here also there is still some progress to be made. Obviously the most vulnerable point in such buildings is to be found in the windows, which, as at present made, offer no resistance whatever to a fire outside. For skylights we have found in the new wire-glass a material at once transparent and fire-resisting, and there seems to be no reason why a similar material should not be used in the windows in the vertical as well as the horizontal walls. Of course it is not to be expected that the tenants of a great office building would be satisfied with the ordinary wire-glass for their windows, but there is nothing to prevent us from designing the most beautiful lace-work of which we can conceive, and having it executed in gilded or silvered wire and embedded in the polished plate-glass of the windows of our "sky-scraper" buildings. Such treatment, whether the tenants liked it or not, would add greatly to the external appearance of such buildings, and would render them practically secure, no matter how numerous or ample the openings, against fire from the outside, as the glass, held by the wire network, would keep its place until it was melted away.

Again, we are told by the fire-engineers that the brick and terra-cotta with which we clothe the steel skeleton of our new buildings are liable to destruction by the combined effect of heat and water, and that when exposed to a serious conflagration, either from the inside or the outside, they are likely to fall off and expose the steel structure. Experience has shown that there is truth in this, but it does not follow that high building must be condemned in consequence. Our Mediæval brethren, in attempting to adapt their old round-arched models to their new conditions, found that their buildings generally fell down. Did they for this reason desist from their attempts to solve the problem imposed on them? No. They knew as we know that

the problem must be solved, and to solve it they at last invented a form of arch which had never been seen before since the beginning of the world. So strange and outlandish did this arch appear to them that for years, although they were compelled by constructive necessity to use it, and did use it with great skill, they disguised it so that no one should notice that their buildings contained anything but the round arch of their forefathers. In the same way, if brick, stone and terra-cotta cannot be made to protect efficiently the metal framework of the buildings which we are trying to make fireproof something else that will accomplish this object will assuredly be employed, no matter how much our traditions may have to be upset for the purpose. For example, there is no practical reason why a steel skeleton should not be clothed first with cement-mortar on iron lath, and then cased entirely over with copper, or brass, or aluminium rivetted at the joints. With a little grouting between the steelwork and the casing to give a substantial backing to the sheet metal, a building of this sort would be almost indestructible. Fire and water would expend their force upon it in vain, centuries of exposure to the weather would only increase the beauty of its patina, and if well anchored to the ground and cross-braced with moderate skill no earthquake could bring it down. It would be a queer-looking affair, no doubt, and the critics would have plenty of sport at its expense; but we may remember in our efforts to accomplish by the light of our own intelligence the results that are required of us, that it was the ugliest of the ducklings that grew up to be a swan, and that in the solution of the most important, most difficult and yet most imperious problem that confronts us certainly lies, to a great extent, the future of the art of architecture in America.

TESSERÆ.

Gothic Mouldings.

GOthic architecture revelled in the use of mouldings, not only what are usually called ornamental mouldings, such as the dog tooth, the ball flower, &c., but also the plain continuous lines of light and shadow, though they are in effect identical, since the former are nothing but serrated ridges, more or less rounded and modified from the first process. Every door, window, monial, every edge vertical or horizontal, every band, string, groin rib, roof label, arch and jamb, whether of wood or stone, internal or external, was generally moulded. Of course, the effect produced by so free and extended a use of them was magnificent. Construction gained thereby a rich perspective, a depth of shade, an tempering of bare prominent outlines, a fine tone, which arrested the eye and made it dwell on certain parts of higher pretension and more exquisite elaboration than others. And yet mouldings are merely the ornamental adjuncts, not the essentials of architecture. Some buildings of the best periods were quite devoid of mouldings, whence it is evident that they are not necessary even to a perfect design. Boldness and simplicity produce effects, different indeed in their kind, yet not less solemn and striking than richness of detail. But the power of mouldings was appreciated to the full by the ancient architects, and it is quite evident that they delighted in their extensive use. It was their ambition to work them wherever they could possibly find means and opportunity. Hence it is that such a vast quantity everywhere remains that no ordinary pains are requisite in examining any considerable moiety of them for the purpose of investigating their principles. If the uniformity in their use had not been tolerably strict it had indeed been a hopeless task ever to master the subject; indeed, if there had not been a system of moulding, there would have been nothing to investigate. But so little did the Mediæval masons depart from the conventional forms, that a capital, a base, or an arch mould is often found of perfectly the same profile in an abbey or a cathedral and in a village church at the other end of the kingdom, so that one might almost suspect that the very same working drawing had been used for both, and this, when it is considered, must appear a very wonderful feat.

The Church of St. Sabina, Rome.

The most interesting of the now solitary churches on the Aventine Hill, St. Sabina, was built, as is set forth in a mosaic epigraph over the chief entrance by Petu, a Roman priest of Illyrian birth, in the time of Celestinus (about 418); though Anastasius assigns it to the succeeding pontificate of Sixtus III., and under date 499 it is named, in the acts of a council held by Symmachus, as among the parochial churches of Rome. Most of its venerable features were altered or effaced by that zealous destroyer and renovator Sixtus V., and even the antique atrium, with columns of marble and granite, gave way to modern arrangement when a lateral was substituted to the chief entrance, for communication from without. The fine Corinthian colonnades of Parian marble between nave and aisles, still intact, present one of the very few examples to be seen in Rome

of shafts and capitals correspondent in dimensions and style among such antiques transferred from Classic to Christian architecture. One singular decorative detail may be mentioned. On a frieze carried above the arcades is the series of discs surmounted by crosses, inlaid in coloured marble, intended to represent the fans (rosta) that used to be hung between columns, amidst the folds of richly embroidered draperies with which the church was profusely adorned at the high festivals of the olden time. Over the chief portals, above the long mosaic epigraph, are the figures, also mosaic, of two majestic females in flowing robes, whose allegoric character is expressed in the inscriptions *Ecclesia ex circumcissione* (sic) and *Ecclesia ex gentibus*—almost unique examples of such personification of the Old and New Law, at least in an artistic form.

Religion and Art.

It is a fact to be distinctly noticed that the three arts which have been called formative, architecture, painting and sculpture, received their earliest impulse from the religious principle, and under its influence entered into a union and sympathy which was never afterwards entirely dissolved in either of their two great periods of heathen and Christian development. Art in its higher sense is not the mere copying of external objects; it is the expression of an idea or a sentiment through a material form. This character it derives from its religious origin. The physical wants of life do not possess an interest sufficiently grand and awakening to call it forth; they are satisfied with immediate fruition, and, as if conscious of the meanness of their source, desire no lasting and conspicuous record of their existence. Not till a later period does luxury borrow from the creations of a higher power the lustre that sheds a spiritual grace on its elaborate provisions for comfort and self-indulgence. In the commencement of society, before acquired associations have obscured the primary distinctions of things, it is only a sense of this mysterious relation to the invisible agencies of the universe that seems capable of acting with so much force on the imagination and feelings of man as to give the idea a preponderance over all the impressions of sense, and to impel him to seek relief from the bewildering tumult of his emotions by embodying it in some visible symbol. His intense consciousness of spiritual life peoples the void with forms and acts resembling his own. He fashions the gods in his own image and surrounds himself with a visionary society of great and wonderful beings, whose name he reveres as a talisman of strength, and in whose honour he puts forth all his resources of tentative skill, guided by the unfolding sense of symmetry and beauty. Thus while his own dwelling is confined and unsubstantial, plain and unadorned, just subserving the necessities of shelter, he rears a colossal pile, court within court, for the house of the Divinity, gigantic statuary lining its avenues and guarding its entrance, and the bright hues and strongly-marked contour of incipient design clothing with a mimic life its interior walls. This propensity to express spiritual conceptions in material forms, whether, as in the East, it remain fixed in a monstrous incorporation of the symbolical with the anthropomorphic, or, as among the Greeks, it disengage itself into the purely human, marks a stage in the process of mental development through which all nations have passed, the Hebrews themselves not excepted.

Sheet Lead and Lead Pipe.

The chief applications of lead in its metallic form are for the manufacture of sheet lead for roofing houses, lining cisterns, making chambers for the manufacture of oil of vitriol, for the manufacture of white lead and of lead pipe. The process by which the sheet is formed is simple. It consists in casting a large plate of lead about 7 inches thick and weighing several tons, and passing it between two polished steel rollers until it is rolled out to the required thickness, a point which is regulated with screws by which the rollers can be brought to any distance required. Lead pipe is formed in two ways, one by drawing and the other by pressure. The former process may be considered as a species of wire-drawing. A cylindrical bar of lead is cast in the first instance with an iron core or rod of a certain diameter; when cold this core is removed and a long rod of the same thickness is inserted in its place, and the whole is then arranged in a kind of mechanism which travels along a table and forces the cylinder through a series of rings of steel of gradually decreasing diameter successively presented to it. By this means the cylinder is continually lengthening and diminishing in diameter, but as the iron core undergoes no change a pipe of uniform bore is at length produced. It is scarcely necessary to remark that the softer the lead the more adapted it will be for making lead pipe by drawing in the way just described; in fact, it is only refined lead that can be advantageously employed for that purpose. The great disadvantage of this process is that the pipe, although in other respects perfect, cannot be made in lengths exceeding 20 or 30 feet. But by what is called the pressure process not only can a pipe of any length be produced, but any kind of lead, hard or soft, may be used. If we suppose a cylindrical iron chamber

with a bottom which moves up and down air tight in it—a kind of piston, in fact—and that on its top is placed another cylinder of much smaller diameter into the upper orifice of which can be fitted a series of rings of different diameters, and in the axis of which and of the smaller cylinders can be placed a sort of core or iron rod of any desired thickness, and if the lower cylinder be filled with melted lead very little hotter than its fusing point, and that we now force the piston in its bottom upwards, the melted metal will be forced into the upper cylinder, where it will become so far cooled that it will become pasty, and on the pressure of the piston from below being continued will be driven in a solid form through the ring forming the open orifice of the smaller cylinder, and will issue out in the shape of a long rod of the same size as the ring. In passing through the small cylinder and ring, however, the semifluid metal will surround the iron core or rod which is placed in the axis of the cylinder, and the rod in passing out will be hollow; will be a lead pipe, in fact. In practice the lead pipe thus made is carried up to about 10 or 12 feet to allow it to cool sufficiently, and is passed over a wooden pulley or drum, and then wound into a coil on a kind of windlass. The piston which forces up the lead in the large cylinder is attached to the ram of a hydraulic press worked by water or steam. The cylinder in which the melted lead is put usually contains about 3 cwt. of metal, and in order to keep so large a mass sufficiently fluid it is surrounded with a jacket of sheet iron, in which a small fire is made. The length of pipe which can be made in one operation is determined by the quantity of lead which the large cylinder or reservoir can hold.

Clay for Brickmaking.

The most important point connected with the manufacture of bricks is the selection of the clay. In the case of common bricks they must be hard and capable of bearing pressure, without at the same time being heavy. One class of bricks may, taken singly, be capable of bearing a much greater pressure or weight than another, but being much heavier, this advantage may be lost by the counterbalancing drawback. They must not fall to powder or crack on exposure to wet or frost, and must be quite free from foreign matter, such as iron-pyrites, nodules of limestone, roots of plants or pebbles. If iron pyrites exist in the clay it will burn in the kiln into oxide of iron when the heat employed is high, and will thus leave a kind of cavity in the brick; with a moderate heat a kind of basic sulphate of iron will be formed, which will rapidly decompose under the influence of air and water and tend to disintegrate the brick. Nodules of limestone will be burned into caustic lime and by subsequent moisture becoming slaked, their expansion will injure the brick and assist in its decay. The presence of vegetable matter will leave cavities in the bricks when burnt and will cause large numbers to fly in the firing. The more plastic a clay is, or, in other words, the purer it is the more will it contract in the firing. This fact has a double importance to the brickmaker. In the first place, a very fat clay, as rich plastic clays are called, will yield exceedingly dense bricks, and are not therefore the best adapted for forming the most serviceable bricks. And in the second, very few clays are homogeneous, the upper part of a bed being in many cases fatter than the lower, a fact easily accounted for, as a mixture of sand and clay suspended in water and allowed to settle will deposit a large portion of the sand first and the finest clay last. If therefore the clay employed in brickmaking be not uniformly mixed, one part may be fatter than another, and the brick in firing will contract unequally. The chemical composition of a clay is also of great importance in judging of its quality. The presence of lime up to a certain point is not injurious, provided it does not exist as pebbles and that it is uniformly distributed through the mass; indeed an addition of lime to fat clays is an advantage. A clay which alone might not be well adapted for brickmaking may be improved by the addition of certain substances, such as lime-sand, or by admixture with other clays of different qualities. Indeed it rarely happens that any clay possesses naturally all the necessary qualities for making good brick, and a skilful manufacturer will always know what materials and in what proportions must be added to render his clay suitable. Thus, in the neighbourhood of London, the very fat clays are mixed with coal ashes or with sand. And in Paris refuse slaty coal is used, as the slaty parts of the anthracite beds are in America. Freshly dug clay does not make good bricks, even when it possesses all the necessary qualities to which we have alluded; it requires to be aged, that is, exposed for a considerable time to the action of the air, which appears to produce some chemical change in the mass. This agency is very much hastened by the action of frost, exposure to frost for a few days being more efficacious than a year's exposure to ordinary weather.

Mr. W. B. McCabe has been appointed assistant engineer on the Dublin Waterworks. The salary commences at 250% a year, rising to 350%. There were sixty-eight candidates.

NOTES AND COMMENTS.

IN the memoir of the late Mr. JOHN WALTER which appeared in the *Times*, it is said:—"In its material surroundings it may be said of him, as was said of AUGUSTUS and his influence on Rome, *invenit lateritiam, reliquit marmoream*. The dingy little office where the *Times* was first produced has given place to the spacious building which now surrounds Printing House Square and faces Queen Victoria Street with an imposing front. The new offices in Printing House Square were constructed, like his own residences at Bearwood and in London, mainly from his own plans, and entirely or almost entirely from bricks made on his estate and from woodwork fashioned in his own private workshops; for Mr. WALTER had not only a passion for bricks and mortar, but a very marked capacity for architectural design. So much interested, indeed, was he in architecture and in London improvements that he used sometimes to say that the only office he would ever have accepted from any Government was that of First Commissioner of Works. In this connection an anecdote may serve to illustrate the determined character of the man, while it reveals a remarkable hereditary trait. During the building of Bearwood the bricklayers employed struck work. Mr. WALTER, like his father, was not the man to be beaten by labour troubles. He at once mounted the scaffolding and began to lay the bricks with his own hands. 'You see I can get on without you,' he said, turning to the men on strike who were watching him; 'it will take a little longer perhaps, but I shall get it done in the end.' The men returned to their work forthwith, and there were no more strikes at Bearwood." It is not easy to arrange accounts when a client supplies some materials and workmanship. An unfortunate lawsuit between the proprietor of Bearwood and his architect exemplifies that fact, as well as another, viz. that in technical cases the lawyers are sure to gain more than the successful litigant.

THE arrangements for the 141st Session of the Society of Arts are now announced. It commences on November 21 with an address from the chairman of the Council, Major-General Sir JOHN DONNELLY. The first regular paper of the new session will be by Mr. HIRAM MAXIM, on his "Experiments in Aeronautics," and this will be followed the succeeding week by one by Mons. HERMITE, on "The Electrical Treatment of Sewage." Two other papers—one by Mr. THOMAS WARD on "Salt," and one by General MICHAEL on "Forestry"—will be read before Christmas. A number of papers for meetings after Christmas are also announced. Six courses of Cantor lectures are promised, of which the first is by Professor VIVIAN LEWES on "Explosives." There will be as usual a course of Juvenile lectures after Christmas; the lecture this year is by Professor VERNON BOYS, his subject being "Waves and Ripples." The meetings of the special sections for the discussion of matters connected with India, foreign countries and the colonies, and applied art, do not commence until after Christmas.

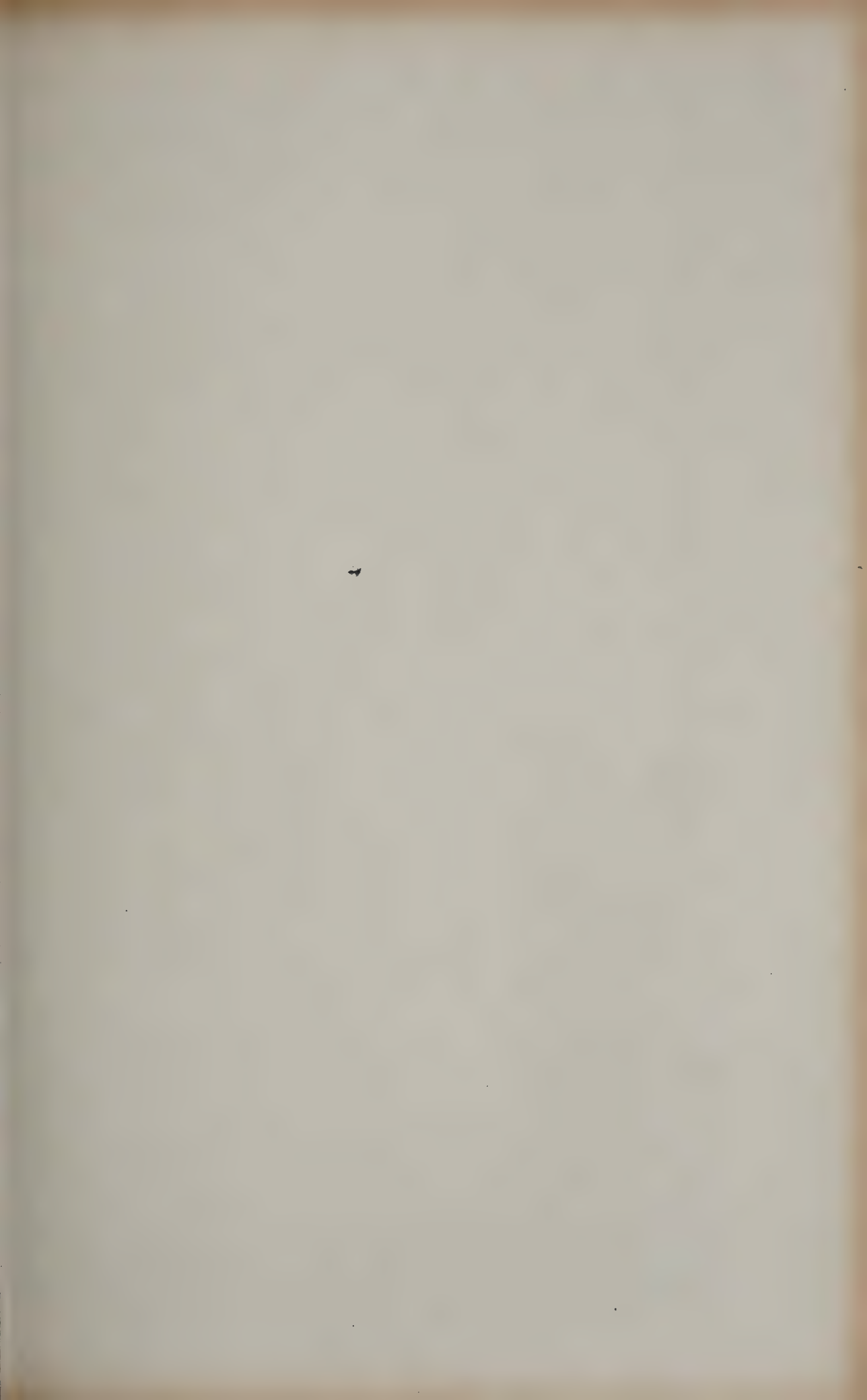
AN innovation in the manner of upholding respect for by-laws was attempted a few days ago in Walsall. Five houses and a shop were erected without a damp-course. Instead of the owner or builders Mr. ROLLASON, the architect, was summoned. The town clerk maintained that as the architect gave the notice to the authority he was the person erecting the building; but if he were not so generally, the effect of the notice which the defendant had served would make him so in the case. In support of his view a printed note appended to the notice was referred to, which stated, "Further, I will make myself responsible for the work being carried out in accordance with the by-laws." The architect's representative contended that the defendant was not the person responsible under the by-laws. Being in the nature of criminal statutes, inasmuch as they imposed penalties, they must be construed strictly or literally, and the words "the person erecting the building" must be understood to mean the person actually doing the work or someone acting as his agent. It could not mean either the owner or the architect.

As soon as the defendant's attention was drawn to the fact that the damp-courses were not in he saw the contractors and wrote the borough surveyor, stating that he had called the attention of the contractors to the matter, and that the latter would no doubt attend to it before the buildings were completed. The magistrates dismissed the summons, but consented to grant a case for the consideration of the Court above on the application of the town clerk, who said a decision on the point raised would be of great importance to the local authorities. It will be no less important to architects and builders.

THE Budget Commission of the French Legislature have been investigating the outlay on the teaching of art, in the hope of introducing a more economical administration. M. LEYGUES, the Minister of Public Instruction and Fine Arts, has given evidence. He has succeeded in persuading the commission to allow the votes for central administration, inspectors of art, inspection of schools, and whatever relates to the application of art to manufactures, to remain undiminished. But a Budget Commission that could not point to retrenchment would be a failure. Accordingly it has been resolved to refuse the vote for the small sum of 600*l.* which is needed to remunerate the professors in the Paris Conservatoire, and to enable additional classes to be opened. In that case the industrial results are supposed to be less manifest.

WHEN MARIE ANTOINETTE came to be installed at Versailles she took possession of the part which had been inhabited by MARIE LECZINSKA. It was at the time decorated in the Louis Quinze style, as the style of the preceding reign, which was generally employed in the palace, was considered old-fashioned. MARIE ANTOINETTE, in turn, ordered the style which was in vogue to be employed. One exceedingly small ante-chamber which separated the king's rooms from the queen's escaped the transformation. The woodwork was an exquisite example of Louis Quinze ornamentation. But the little room was obnoxious in the eyes of LOUIS PHILIPPE's restorers when they were operating on the palace, and it was covered with a thick coating of whitewash. Some days ago an attempt was made to remove the whitewash, and during the progress of the work some beautiful painted ornament was found. In consequence, the removal was ordered to be executed with the utmost care, and there are hopes that the ante-chamber will once more resume the appearance it presented when MARIE ANTOINETTE became the tenant. There is so much vastness about the rooms in Versailles, a small enclosure of the kind would be a welcome sight to visitors.

IN 1899 will be the tercentenary of the birth of VELASQUEZ. The Academy of Fine Arts in Seville contemplate a celebration of the event. It is proposed to have a competition for an essay on the life and works of the great painter. A medal is also to be prepared which will bear a portrait of VELASQUEZ, and a marble tablet will be placed on the house in which he was born. Is it not remarkable that Spaniards should so tardily be convinced of the honour which accrues to them from having VELASQUEZ as a countryman? If it were not for foreign nations his memory would have perished in Spain. The first to reveal the greatness of the artist was the German painter and writer RAPHAEL MENGES, who in 1776 wrote an epistle, which is printed in the sixth volume of the "Travels in Spain," by Don ANTONIO PONZ, upon the pictures in the palace of Madrid. According to MENGES, the best models of the natural style or the imitation of nature are the works of DIEGO VELASQUEZ, and he maintained that if TITIAN was a better colourist, the Spanish painter far surpassed him in light and shade and in aerial perspective. MENGES was particularly attracted by the *Water-Carrier of Seville*, the *Bacchus*, *Vulcan's Forge*, the *Spinners*, the portraits of *Margaret Mary of Austria*, *Philip IV.*, *Oliveres*, the *Capitulation of Breda*. "If anybody," said MENGES, "wishes for more perfect work, it must be sought in nature, and not in painting."





PHOTOGRAPHED BY BEDFORD LEMERE & CO

9th 1894.



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

M PLACE, W.
hitect.



INK-PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

DESIGN FOR ST. AIDAN'S CHURCH, WALTON-LE-DALE.

Messrs. F. C. EDEN & J. L. WILLIAMS, Architects.



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THE ROMANS

FROM THE PAINTING

1894.



INK-PHOTO, SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

THE DECADENCE.

THOMAS COUTURE.

ILLUSTRATIONS.

THE ROMANS OF THE DECADENCE.

AMONG all the thousands of paintings which have been produced in France during the century, there is not one which is more likely to be accepted hereafter as a worthy companion of GERICAULT'S *Raft of the Medusa* than the *Romains de la Décadence*, of which we give an illustration. Both works have defects, especially in colouring, but they have that mysterious impressiveness which makes hypercriticism appear as insignificant. Both were produced by young artists. GERICAULT was twenty-eight when he exhibited *Le Radeau de la Méduse* before his countrymen, who were unable to appreciate its power, and what recommended it to Parisian amateurs was the admiration it received in England. COUTURE'S *Romains* was the work of a man of thirty, and it was received with apprehension rather than with admiration. It was instinctively considered to be a warning of coming calamities, ominous as the handwriting on the wall, for the Roman debauch was only a symbol of Parisian life. Accordingly the critics put it under the microscope in order to discover sins of omission rather than commission. Where, asked MAXIME DU CAMP, are the gladiators who fought at the feasts or the dwarfs who used to seek after the withered wreaths? Where are the psyllæ who played with serpents, the Greek poets who sang the praises of the guests, the rope-dancers, the lampreys in crystal globes, the relays of slaves who bore Cretan wine? The picture does not correspond with the "Satyricon" of PETRONIUS, nor represent all the details of the feast of TRIMALCION, therefore it is not a historical painting. The critics were unable to perceive that, by force of the insight which belongs to genius, COUTURE summarised in one work a series of descriptions of the degeneration of a great race through an excess of unrefined luxury. GIBBON said that the manners of the Romans, previous to the fall of the Empire, had been made the subject of minute and laborious disquisition; but as he was restricted by the limits of his work, he preferred to confine himself to what had been said by AMMIANUS MARCELLINUS. If COUTURE'S work existed in the eighteenth century, the English historian would be sure to recommend his reader to study it as an epitome of a time when "the greater part of the nobles dissipated their fortunes in profuse luxury, found themselves poor in the midst of wealth, and idle in a constant round of dissipation." In the picture we see men who were preparing themselves to be the victims of ALARIC, who was to compare them to hay—"the thicker the easier mowed"—and to be amused by their menaces.

COUTURE was treated as a croaker, and was not allowed opportunities to make Frenchmen uncomfortable. On his side he was too proud to produce works which he thought would be a renouncing of principles. He withdrew more and more from Paris life until he was at last considered to be an ancient master belonging to some indefinite period. People wondered to see his colossal picture in the Luxembourg among the works of living painters. In 1878, that is, a year before the artist's death, a correspondent of *The Architect*, who was puzzled by the uncertainty which surrounded COUTURE'S name, courageously resolved to inquire about his fate, and the following graphic account of an interview with the painter reveals the bitterness of a man whose powers were undiminished, but who could say with TIMON—

My long sickness
Of health and living now begins to mend,
And nothing brings me all things.

The tub in which it was the good pleasure of Diogenes to live was not a greater contrast to the palace in which Alexander dwelt, than the home of that Nestor of Art, Couture, and the ateliers of the present generation of artists. The most inaccessible of human beings, and yet a genius so undeniable that it would be impossible to consider a review of Paris studios complete unless his were included, the question arose—how obtain admittance to his house, and where is it? To these inquiries, the reply of men who are yearly exhibitors and who know the artists' world *au bout des doigts*, was, in more than one instance, "Couture's home! *Mon cher*, he is dead, ages ago; a great man in his day, but Couture belongs to the past." Not so, however, among his friends and devoted adherents. One of these called for me yesterday. Along the Champ-

Elysées, crowded as all such fashionable promenades are on New Year's Eve by the great world; past the Rue de Rivoli, thronged by Parisians, selecting from the glittering productions of art and industry their last *drewnes* for the one *fête* of France, *le jour de l'an*; past city warehouses, encumbered by bales of every species of manufactured goods for the supply of the splendid shops which convert the boulevards into a world's fair; along narrow streets, such as were once, before the reign of King Haussmann, characteristic of Paris—streets an artist delights in, although inconvenient in the extreme, on account of narrowness, horribly paved, moreover, but picturesque and full of quaint bits of old-world architecture, which Prout, had he been of the party, would have sketched, on to the least savoury among them, and indeed, truth compels me to write to the dirtiest—Rue Geoffroy l'Angevin No. 9—and there my friend stopped. I felt relieved, for it struck me he never would. We ring at a narrow gate, once green painted—a Bretonne appears at the end of a dark corridor. The wooden balustrade of a staircase partly conceals her figure, but the white wings of the cap of her native village attract the only ray of light admitted from the smallest possible lucarne. Yes, M. Couture was at home, so was Madame and his daughters. My friend rapidly followed the Bretonne—a precautionary measure, taken in order that the great man should not have time to frame an excuse for sending us *au diable*. Up the somewhat rickety stairs, along low corridors, down dark passages, we pass until we come to an open door, and a charmingly fresh face and a soft voice greet us, and we are ushered into a room essentially different from any I ever saw in Paris, inasmuch as the floor was of white planks, the tables and chairs of deal, and the walls were whitewashed.

Nevertheless, we were in the presence of the great man. We disturbed him while enjoying a quiet smoke. He wore a grey dressing-gown, and, as he rose to bid his friend welcome, the thought flashed on me—how like Dr. Johnson's portrait. Yet he is a shorter man by many inches, and the likeness is strongest when he is seated. His manner, also, is pre-eminently Johnsonian, as also his dry humour and caustic sayings. It required no small amount of diplomacy on the part of my friend to induce the old man to receive your correspondent *en qualité de correspondant*. "You have come," he said, "to visit my atelier? You have seen others?" I answered in the affirmative. "Well, then," he said, "you write to *The Architect* that Couture paints without an atelier. He does his work by machinery. He has a mould; he puts his ideas into it; gives it a shake, and the trick is done." This was promising. "Sir, you don't seem convinced. Well, I will tell you another system. Couture takes a telescope; he turns it the wrong way; he draws what he sees at the small end. 'Atelier,' sir, never had one in my life. Couture is dead, he exists no longer."

At this juncture the portrait of a girl met my eye. I asked was it one of his daughters. The old man at once plunged into the subject of the splendid head which had attracted my attention. No, it was not of his daughter. It had been painted thirty years since. It was called *La Commère*. The young girl had been godmother with him to the child of a friend, and he had painted her. The portrait had been purchased by an amateur in Holland, who had died two years since. Couture commissioned an agent to purchase it at the sale which took place of the Dutch gentleman's property. The price was beyond him, 200*l.*, and the agent let it go, but its second purchaser, on hearing that Couture had wished to buy his own picture, had courteously lent it to him to copy, and thus it hung on his wall. "Voyons," he said, with something which might have been meant for a smile, "you would like to see something else of mine, but my pictures are all over Europe, most of them are in America," a fact I knew too well. Then said Couture to his wife, "Take monsieur to see the *Wives of the Volontaires*."

We crossed by a wooden gallery across an inner court, and thence up flights of the narrowest of stairs, to a room in which there was but a single article of furniture, and that an easel, but on that easel a picture worthy of a place in the gallery of a great people. I knew Couture only by his great work at the Luxembourg, *La Décadence Romaine*, and by his book on art study. I confess I was speechless in presence of this superb painting, which is but a fragment of his great picture *Les Volontaires de '93*—a work as large as either of Paul Veronese's pictures in the Salon Carré of the Louvre, and which has been rolled up for the last quarter of a century, but which there is some hope he will be induced to exhibit at the coming Exhibition. Volunteers are starting for the frontier; they carry with them "Liberty," personated by Théroigne de Méricourt, seated on a gun carriage, which by the bye, is of the Louis XIV. period. The wheels as they turn crush symbols of royalty, such as the crown, sceptre, &c.; women hold their children up in the air, and call on the volunteers to defend them. A motley band in truth are the said volunteers—some wear the uniform of the Republic, some the worn-out costume of the day, and some are genuine *sans culotte*.

A few of these men have left young wives to mourn the fate of war, and the picture before us is of two of these—a mere

fragment, as I have written, of the great composition. A woman of say two or three and twenty stands before you; she has gone through the agony of parting; yet her eye is tearless; her dark hair thrown back; her dress a chemise of thick linen, which displays her neck and shoulders, as well as her arm; her petticoat is of striped linsey. On her right shoulder leans, weeping bitterly, a younger woman; her colouring is fair, the hair of the tint of auburn Guido paints; her dress also a low-cut chemise and a skirt of linsey. It is rare to look on such work. There is a solidity, a richness, a depth of colour which comes upon us as a thing of a past age. The flesh has a firmness, a reality, if I may use the term—I do not mean to do so in the term of realism—that astonishes one, accustomed as one is to the railway speed at which a younger generation of artists lay on their colour. The folds of the linen, the thick plaits of the linsey have a density and an amplitude in their heavy folds which make you think of a Rembrandt rather than of any modern artist. Grief too deep for tears is expressed by the one figure, wild despair by the other; and the impression made by this grand work was well expressed by my friend when he uttered *C'est superbe!* We returned to Couture.

In our absence he had evidently reflected on the object of my visit, for he offered me a sheet of paper, and proposed to dictate my letter to *The Architect*. *Je ne demande pas mieux*, was my reply, and he bid me write as follows:—The translation is verbatim.

I set out in search of Couture, and succeeded at last in discovering him in a horrible quartier central, there I found him in a house still more dirty than the quartier—I fancied I should have found the painter in an atelier more or less resembling other ateliers—he was taking his siesta. I explained to him that I wished to write about his pictures, and requested him to be kind enough to allow me to see any he might have in his house. “I am profoundly touched by your solicitude,” replied Couture, “but having all my life dreamt of pursuing art after the manner of the ancients, and having unhappily remarked that men in modern times have degenerated into monkeys, in despair at this change I have had but one desire, and that is to avoid being spoken of by this species or in any way attracting their attention.”

The dictation ended; we induced this most original of types to talk of his works. “In France,” he said, “we have Governments which last a week. ‘The Volunteers’ were ordered by the Minister of one dynasty, and counter-ordered by his successor of the next. I was disgusted. I rolled up my canvas. The last Emperor, Napoleon III., wished me to paint the baptism of the Prince Imperial. His wish was intimated to me by the Prime Minister Fould, who at the same time announced that I had been selected to decorate the newly-built Pavillon Denon of the Tuilleries. I set about the picture of the baptism, and submitted the first sketches to the Minister. He received me graciously, but instead of examining my sketch, began to talk about a picture he wished for his château, and asked me about the price it would cost. In my simplicity I named a price. He immediately changed the subject, and dismissed me somewhat abruptly. I received in a few days an intimation that the baptism must be executed in a manner totally different to what I had conceived. There must be so many chamberlains to the right, so many ladies in waiting to the left, so many princes here, so many princesses there, the Emperor and Empress exactly in the centre. ‘Impossible,’ I exclaimed, ‘Couture cannot paint thus, and they know it. How comes it, that when I received the order I was informed that I was to paint as I conceived the subject, the Emperor had specially sent this message?’ I was too simple. I had not understood that Fould, the great Minister, had expected me to offer him the picture he wanted for his château as a *pot-de-vin*. I refused to paint the baptism, and since have declined all Government orders. *Ce sont tous des farceurs*. People of the world do not understand art. *Ils ne font qu’encaçonner l’art*. We have so many Governments I cannot recollect all I have lived through, but there was one in ’48 which called itself a Republic. The Prefect of the Seine then was Berger. He was revoked, but he wished to annoy his successor, therefore the last thing he did before going out of office was to order me to paint three subjects for the Chapel of the Virgin at St. Eustache, which I did. The new Prefect fell on troublous times. He had too much to do, and forgot to ask me for a *pot-de-vin*, which I should not have given him in any form.”

Couture was born in 1816. He drew and modelled from the time he could hold a pencil. At seventeen he entered as student the atelier of Baron Gros. Subsequently, Couture and Healy studied under Suisse, and from that accidental circumstance sprung up a friendship which has never been interrupted. Of late years Barbedienne has purchased all his compositions, and several of his pictures are now to be seen in the Barbedienne's Gallery, Boulevard Montmartre. Among the works Couture refers to with greatest satisfaction are *Le Duel* and *Circé*. In the former he has thrown all the interest of the scene on the youthful victim, who has fallen by the hands of an old duellist, whose dexterity the witnesses are basely com-

plimenting. The *Circé* is a woman of faultless proportions, seated in a car, to which are harnessed four of her lovers, each representing men of different types and ages. This painting is the property of an American.

QUEEN'S HALL, LANGHAM PLACE, W.

COMPETITIVE DESIGN FOR ST. AIDAN'S CHURCH,
WALTON-LE-DALE.

THE illustrations of this design represent alternative schemes—one with a single arcade (shown in the interior perspective) and the other with the usual arrangement of nave and aisles. It is demonstrable that the piers of a single central arcade “obstruct the view of altar and pulpit” far less than do those placed in the ordinary way, though this is seldom an advantage. The design is by Messrs. EDEN & WILLIAMS, of 3 Staple Inn, and was exhibited this year at the Royal Academy.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of the Institute was held on Monday evening, Mr. F. C. Penrose, F.R.S., president, in the chair.

President's Address.

The PRESIDENT said:—In the opening address of the President in former years you have naturally expected; and have not been disappointed in receiving a general account of the state of the Institute and of its undertakings, especially during the interval which had elapsed since the previous annual address. I think I may say without any exaggeration that the Institute has continued to gain both in position and influence. As to the gain in members without reckoning most welcome support given us by the allied Societies, if we compare the numbers, I will not say sixty years ago—a date of which we were most agreeably reminded in July last—but taking fifty years ago, the increase is remarkable enough to be worth mention. The class of Fellows numbered at that time but little over one hundred; there are now more than six hundred. There were then some eighty Associates only; now there are nearly nine hundred—and this notwithstanding the barrier which has been surmounted by most of the later members, namely, the examination.

I think it is now generally recognised that the examination in architecture has fully justified its establishment; at any rate, it has become a great fact. And it seems important for me to call attention to this point, namely, that the present month brings the former and partly tentative arrangement to a close, and from henceforward begins the system of progressive examinations, the details of which will be found fully set forth in the recently issued Kalendar. I consider that these examinations cannot but have an excellent effect—first, and directly, in securing to our future members the reputation of having satisfied a certain standard of proficiency; secondly, and indirectly, by excluding from the Institute in the first instance and by reaction from the profession at large, young men whose abilities would be more advantageously directed towards the pursuit of some other calling.

I cannot leave this subject of membership without reminding you that the Charter declares the Institute to consist of “three classes of subscribing members, namely, Fellows, Associates and Honorary Associates;” and though both the Fellows and Associates are steadily increasing in numbers, the honorary Associates have been allowed to dwindle from 115 in 1878 to 60 in 1894, a decrease of nearly half, due, I am inclined to think, to a misunderstanding of the objects and principle which dictated the establishment in 1877 of this class of members. I am convinced that the development of this class of non-professional members will greatly enhance the usefulness of the Institute. We should wish to enrol in our honorary Associate class many more painters than are now in its ranks, a large number of sculptors, engineers at home and abroad, the masters of the great crafts, and the more prominent of those thinkers and workers who, by their books and discourses, disseminate love and respect for the several arts and sciences of which the embodiment is architecture.

There is another section of membership of the Institute, pertaining to the non-subscribing class, which has always seemed to me to form an essentially important part of corporations such as ours—I mean the class of corresponding member, or foreign correspondent. At present the majority of such members is distributed over France, Germany and Italy. We have two in Denmark, two in Sweden, two in Spain and Portugal, two in Greece and Turkey, three in Austria, four in the United States of America, five in Belgium and Holland.

Now I want to see Austria and Hungary largely represented in our ranks, and it is gratifying to know that two of the most distinguished architects of Budapest—a magnificent city of which too little is known in this country—are nominated for election. I should be glad to see Austria at least as fully represented among us as Italy is, and I hope that the increasing popularity of Spain as a resort for study among the students of the Institute may lead to an exchange of ideas, a reciprocity of knowledge, between the architects and students of the respective countries. Most, if not all, of the greatest European architects and archaeologists have been correspondents of our body, and even in 1842 they were fifty-five in number, while at present, after the lapse of half a century more or less prosperous, we have only forty-nine. But what is still worse, a startling omission occurs in this list—the architects, archaeologists and similarly learned men of Russia are absolutely without a representative among us. A few years ago we possessed Constantine Thon, Professor Strohm and Professor Resanoff, and in 1842 there was Alexander Bruloff, of the St. Petersburg Academy of Fine Arts. Some attempt I think should be made to renew the ties of confraternal association which have existed, and which ought always to exist, between the architects of the mighty Russian Empire and ourselves. There never was a moment when such a reunion could be attempted with more chance of success than now.

The London Building Act, 1894.

I have almost completed the observations I wished to make upon what may be termed the personal affairs of the Institute. But there is one point to which I think your attention should be directed. I allude to the present position of district surveyors in London.

A new Metropolitan Building Act has passed the Legislature with so many new provisions that it will require much study on the part of those who have to enforce it as district surveyors or to obey it as architects. Under this measure—the London Building Act, 1894—which comes into force on the first day of next year, the Institute still remains the examining body for granting certificates of competency, without which no person can become a candidate for the office of district surveyor in London. This statutory examination, until the present County Council imposed a condition that a district surveyor shall not practise as an architect, was always well attended, and those who presented themselves for examination were generally men who had not only received the education of an architect, but had practised as such. Not long ago this statutory examination was held quarterly, and the examining board had then much to do in order to finish the oral part of the examination on one day. But now very few persons apply to be examined, and during the last official year the two examinations announced to be held did not take place, owing to the want, or perhaps the paucity, of candidates. Yet a district surveyor, if he is to do his duty by the London Council who appoint him, as well as by the architects whose buildings he has to inspect, should have that knowledge of architectural science or building which can only be acquired by an architect who has been engaged for, say, seven or ten years in the active practice of his profession. I will not go into the question whether a district surveyor ought or ought not to be allowed the right of private practice, but I am certain that he ought to have practised as an architect before attempting to fulfil the duties of a district surveyor under the London Building Act. Is there, then, anything unreasonable in the suggestion that the London County Council would be wise in including among the conditions of such appointments the proviso that every candidate for the office of district surveyor in London shall have previously qualified for admission to the class of Associates of this Institute, and have either passed thence to the class of Fellows, or have become admissible by length of practice to that class?

Three Thames Bridges.

We have lately seen brought to completion by our honorary Associate, Mr. Wolfe Barry, a great engineering work with which the late Sir Horace Jones was originally associated as architect. If he had lived to superintend the completion of the design of such parts of it as lay in his department, he would probably have left the towers more massive in appearance than they are. It is, indeed, greatly to be wished that association between architects and engineers, in cases where their provinces overlap, were more frequent than it is. I well remember Professor Cockerell regretting a lost opportunity of the kind in the case of Waterloo Bridge. Sir Robert Smirke had offered his assistance to Mr. Rennie in profiling and adjusting the Doric columns which formed part of the engineer's design, but the latter declined. The baldness of those columns is a serious defect to the beauty of the bridge, which, indeed, would have been handsomer if the columns had been omitted altogether, and one of the good results of the Tower Bridge is that it relieves the necessity of tampering with the noble simplicity of London Bridge.

The Wembley Park Tower, &c.

In contradistinction to works which are satisfactory for their actual or hoped-for achievement, I feel called upon to mention one of which the stoppage would, it seems to me, be matter for congratulation, and to express the hope that no further progress may be made with it, unless it be to convert what already has been done into something far less pretentious than the original intention, which, if carried out, would spoil the scale of everything else for miles around it. I need not explain to anyone here present that I refer to the incipient structure of the huge steel tower at Wembley Park, in the north of London. Possibly, if its lower storeys were turned into something of the nature of the hanging gardens of Babylon, it might be an interesting and unobjectionable structure; but if the original scheme is to be carried through, you will, I think, agree with me in wishing confusion to a new Tower of Babel.

Again, with regard to another point which is not, I fear, so much attended to as it ought to be. It cannot be too strongly insisted upon that when new buildings are erected by the side of old buildings of established architectural merit, the utmost care should be taken that the new works do not injure the effect of the older. I think many of us must have been often much pained in witnessing such injurious treatment of old venerated monuments. I am particularly thinking of the case which our late President so much and so eloquently lamented, namely, the new buildings of King's College abutting with such small consideration against Somerset House, notwithstanding the most laudable attempt of our Council to prevent its being done. Another case of the kind has occurred, but not so recently, at Exeter. There was till comparatively lately, as in the case of several of our cathedrals, immediately contiguous to the west front of Exeter Cathedral a small church, of no remarkable architectural value certainly, but which by its very smallness gave valuable scale to the cathedral. At a later visit I found it had been replaced by a church of much larger proportions, and the merit with reference to the cathedral which its predecessor had was entirely lost. In my opinion, though the wants of the parish may have required the enlargement of the church, there was no occasion for the architect to have so raised the tower and spire as to overtop the venerable cathedral.

"Architecture: A Profession or an Art?"

I shall not attempt to meddle with the controversy which some time since was raised as to whether architecture is an art or a business. The two elements are no more separable than are faith and works; and our teaching to students properly takes cognisance of both. To the art element and the thoughts more immediately connected with it, I propose to confine myself in what I have still to say to-night.

The Threatened Destruction of Philæ the Beautiful.

The original sources from which we derive our art must always have an intense interest for us, and whilst we are in hopeful expectation of new light being thrown upon Greek archaeology from the researches of the French architects at Delphi, under the experienced and skilful guidance of M. Homolle, the director of the French School at Athens, we are not indifferent to grievous tidings which come from Egypt—a strange proposal which, having been more or less vaguely in the air for some time, has recently assumed alarming consistency. I refer to the proposed Nile barrage to be built across the river at Assouan for the purpose of storing up the waste waters of the annual inundation in a huge reservoir, in such a manner as to submerge and ruin a series of the most beautiful and interesting remains in the country. The deluge which is threatened would extend from Assouan as far as Korosko, a distance of fully one hundred miles, forming a lake of which there would be no parallel in Europe, submerging the Island of Philæ, with its celebrated group of temples of the highest beauty and artistic value, and eleven or twelve other important sites, particularly the fine and very perfect temple at Kalabsha. In addition, moreover, to what we know would be lost, it should be noticed that, as the region of Nubia in which they occur has not been so carefully examined as most other parts of ancient Egypt, it is more than probable that many objects which would otherwise reward future exploration if they remained, as now, accessible, would be lost for ever. Again, if anything happened to the dam, what would be the fate of Lower Egypt and all its inhabitants and all its treasures? We need not fear but that the engineers would do their best to make it secure; but sad instances of the failure of reservoir dams, where everything ought to have been well constructed, are not unknown to us, and the region has been subject to earthquakes so violent as to thrown down even Egyptian structures.

The proposal has, unluckily for one point of view, much that is tempting to utilitarian minds, and we are not as a nation exempt from the reproach of yielding in cases where men of business have had to choose between sentiment and prospective

gain. In the case of the Nile barrage we must do the Egyptian Government the justice to say that they would seem to deplore the injury to art and history which would follow; but the premium which is held before them is so large that we may feel sure that any attempt to oppose an absolute negative to the scheme would be simply futile; nor would it be right. Our own Government, again, is doubtless in no enviable position in the matter. If by an exercise of power we were to prevent the work from being undertaken, it is easy to see what a deep and, may be, dangerous feeling of disappointment would arise in Egypt; whilst if they consent to it, our rulers would incur much obloquy both at home and abroad. As for the Island of Philæ, it is true that a scheme has been proposed for lifting up the remains above the surface of the reservoir; but it can hardly have been proposed seriously. It would be ruinously expensive to do it at all adequately, and would quite destroy the value of remains now perfectly adapted to the island on which they stand. Practically, the attempt, if made, could not fail to be worse than submergence. It has been also suggested that a dam of less elevation, placed above instead of below the Island of Philæ, would for a long time answer all legitimate demands for water-storage, and would involve a much smaller sacrifice of valuable antiquities or disturbance of inhabitants; and if at some future time the demand should arise for a larger supply, other means not now available—new sites, for instance, above Wady Halfa—might be found. We may, at least, hope for the escape of Philæ and some other of the Nubian antiquities, and this gradual method of procedure would seem to fit in with the expectations of the proposers of the barrage, for the supposed profits on which the scheme is based are not to flow in at once, but, as Mr. Garstin, Under-Secretary of State for Public Works in Egypt, himself says, the great expectations are founded on an eventual increase “which it will take years to arrive at.” On this subject I would draw your attention to a pamphlet printed by the Society for the Preservation of the Monuments of Ancient Egypt, in which a more gradual method of water-storage is strongly advocated.

Old and New Methods of Design and Practice.

Turning homewards, it may be useful to institute a comparison between some of the results of architectural work of the present between those of an earlier period in this country. In making this comparison we must not lose sight of the great differences in the two periods, both in respect of the demands upon the architect and of the materials available to his hand. The greater complexity of the conditions of modern life is unfavourable to the modern architect in some respects. It requires him to spend a large portion of the funds available for a building in work which, however important, can produce no æsthetic effect, and the many calls upon him to satisfy a variety of wants must necessarily make it very difficult to secure that charm of simplicity and proportion which is an essential ingredient in work of the highest quality; indeed, with so many importunate claimants for attention, the time which must have been devoted to rhythm and harmony by the older architects can now seldom be spared. There is, therefore, a great temptation to accept a premature solution of the problem provided the requirements of the plan appear to be satisfied, and provided the resultant grouping, however haphazard it may be, accords with some idea of picturesqueness which natural or acquired taste can generally secure. I do not, however, venture greatly to blame this result. It is far better that a good plan should command the obedience of the elevation than that a preconceived symmetrical elevation should force the plan into inconvenience. Nevertheless, a more excellent way is almost always possible where the plan shall still rule, but with all the difference between marching order and broken ranks; though, as I said, it may require more time for working out than can be spared in any particular case. Genius has been defined as the power of indefatigable study. Such genius is indeed very necessary for the highest achievements of architecture. There are certain buildings, such as club-houses, theatres, town halls, and, above all, ecclesiastical structures, which lend themselves much more than others to be treated by the rules of art; but there are none, not even the most humble, which may not be improved through study with an eye that loves proportion. It is a duty the profession owes to the public to do this on every possible occasion.

To return to my comparison between the older and later architectural works. There is a point which seems to be deserving of attention, but whether it admits of being to any great extent brought into operation I do not venture to say. The modern architect, owing to the way in which drawings, specifications and bills of quantities are prepared, and the exactness with which contract works are expected to follow out those documents, has seldom if ever the same freedom in studying his design as it develops itself, and in making improvements which suggest themselves as the work goes on, that our predecessors had 200 hundred years ago. The designs made by Sir Christopher Wren for St. Paul's Cathedral underwent great changes during the progress of the building, as there are many

extant working drawings to show. Some liberty, of course, we have by the usual conditions of contract, but the greater rapidity of modern construction, and the fear of additional cost to the employer, limit considerably the free use of those conditions; and this want of elasticity, so to speak, in availing ourselves of opportunities offered by the study of our works whilst in progress, is one of the points on which the older architects had a great advantage over us.

A Permanent Gallery of British Architecture.

Let us now compare the works of some of the older with those of more recent architects. But before doing so I would urge upon those in whose hands rests the power of developing the means of architectural study to consider the possibility of forming a permanent exhibition of drawings representative of English architecture. The suggestion, indeed, is not new, nor is it mine; but I have received a letter on the subject from our Fellow, Mr. W. Howard Seth-Smith, which is so much to the point that I propose to read a portion of it. He says:—

If we are to look for real and permanent progress in architectural design, we must in some way create public interest and enthusiasm for beautiful building. A permanent exhibition would be the very best means of gaining public interest in our art. It is the galleries which have made art more popular. I would propose that a permanent exhibition be organised of most carefully chosen architectural illustrations of the best ancient and modern designs, classified under all the great divisions of building, such as civil, ecclesiastical, domestic, scholastic, &c. There should be one department for photographs of selected ancient work, chronologically and topographically arranged and carefully described. This would supply the urgent and often-expressed want of an illustrated lesson on the characteristics and developments of the great architectural epochs and styles of the past.

I certainly consider Mr. Seth-Smith's proposal one of great importance. To be of any service it would require to be carried out in an effective manner, and if this could be done, it could not fail to be advantageous both to our profession and the public at large.

Returning to my proposition before stated, the list of the architects I propose to refer to begins with the two greatest names on our record, namely, Inigo Jones, who practised in the reigns of James I. and Charles I., and Sir Christopher Wren, who practised in those of Charles II., James II., William and Mary and Queen Anne.

Inigo Jones.

Inigo Jones had settled at Copenhagen, and the King of Denmark's sister, who married our James I., brought him back to his native country. He then travelled for further study in Italy. The beautiful fragment at Whitehall is, as you know, only a small portion of the magnificent palace which he designed for King James, preserved to us, no doubt by the liberality of Lord Burlington, in Kent's fine edition of Inigo Jones's works. Besides the Banqueting House, there are but comparatively few remains of Inigo Jones's buildings in London. We have lately lost a very interesting work of his in Lord Shaftesbury's house in Aldersgate Street, which was taken down about ten years ago. It had already suffered much, but was still a noble fragment. There is also the much-mutilated east front of St. Paul's, Covent Garden, and the Piazza on the north side of the Market; and there is the Water-gate at the bottom of Buckingham Street. This gate, although it retains its beautiful proportions, has lost much of its interest now that it no longer gives access to the river; but its preservation under any circumstances is a thing to be grateful for. A house on the west side of Lincoln's Inn Fields still shows the handiwork of Inigo Jones. Ashburnham House, Little Dean's Yard, Westminster, built by him, has been much altered, but there are remains of his work in the interior. There are probably a few others, but a good deal has been attributed to him on insufficient grounds.

Wren's Principal Works.

Sir Christopher Wren's first work of any importance was the Sheldonian Theatre, Oxford, designed by him in 1664—a building which still admirably answers the purpose for which it was constructed. At this time Wren was busied with various designs for altering Old St. Paul's, which had survived in a very ruinous condition the ill-treatment of the sixteenth century and of the Commonwealth. The Great Fire in 1666 put an end to all attempts to repair and alter it and made a new building necessary. I am not intending to dilate upon the existing cathedral, which you all know so well and in which there is so much to admire, but I should like to call your attention to a design which is even more distinctly Wren's than the existing cathedral. I refer to his first and favourite design, for which an elaborate and large scale model was prepared. This model still remains, though, unhappily, it suffered from neglect during many years, and I am glad to be able to inform you that it is undergoing restoration, though progress is necessarily slow. It is, however, in quite a sufficient state of preservation to enable Sir Christopher Wren's merit to be fully appreciated. We have here by Mr. Goodchild's kindness, two splendid drawings

presenting the interior of the cathedral as it would have been Wren had been allowed to execute this design. I do not say that it competes on equal terms externally with the existing structure, especially when we consider the height of the surrounding buildings, which gives the value of greater loftiness to the adopted design. But when we consider the two interiors, the balance altogether preponderates in preference of Wren's favourite design. As for certain defects in it, which Fergusson in his "History of Modern Architecture" discusses, we must remember that Wren had not, in the case of this design, as he had in the adopted one, thirty years of study and improvement to give to it as the work proceeded; but this marvellous production was the outcome of necessarily a very rapid incubation.

The late Rev. J. L. Petit, the exhibition of whose splendid water-colour drawings at the Institute some of us may remember, in discussing Saint-Front, Périgueux, and what has been said still might be derived from it, observes that Wren—who, though he may not have known Saint-Front, must have known Mark's, Venice, from which Saint-Front was derived—had conceived a design" (namely, this his favourite model) on similar principles, which, had it been carried out, would have given his cathedral the noblest interior in the world." I commend the whole passage and indeed the whole book to our study.

It is evident that Sir Christopher Wren's designs embodied the result of much study and many approximating revisions in preliminary sketches, carrying out in this the precept of Horace, "Sæpe stylum veritas," which may be familiarly translated, "Use your indiarubber freely;" and when the final result was attained I believe we shall always find that he considered rhythmical proportions as essential to completeness in architectural design as they are to poetry. I find the same thing in the two buildings of Sir Christopher's I have chiefly studied, namely, St. Paul's Cathedral and St. Stephen's, Walbrook, and I have no doubt it obtains also in his lovely creations Bow Steeple, St. Vedast, St. Martin's, Ludgate, and others of his works, which possess admirable qualities of elegance combined with simplicity.

Wren's Pupils and Followers.

The most conspicuous of Wren's followers were his pupil and assistant, Nicholas Hawksmoor and Vanbrugh and Gibbs, whom may be added, as an associate, Dean Aldrich, who built the church of All Saints, Oxford, and the Peckwater Court Church, in a style much in harmony with that of his friend, Sir Christopher Wren. The three first-named have left stately monuments. To mention only one work of each: Hawksmoor has given us, in his church of St. George, Bloomsbury, a monument worthy of the classical feeling he had imbibed from his master; James Gibbs, in his church of St. Mary-le-Strand, a work of great elegance, which I select from among his other buildings for the purpose of recording the attitude due to our late President for the zeal and pains he displayed in its restoration a few years ago, when its demolition as threatened by the utilitarians of the day; and Vanbrugh Castle Howard, a noble pile more pure than Blenheim. Vanbrugh, however, failed to impart, as Wren did, sufficient elegance to his powerful masses.

The above-named architects represent in date the middle of the seventeenth and the dawn of the eighteenth century, and they are the authors of standard works with which it is hard for the modern-schools to compete. The middle and end of the eighteenth century witnessed performances many of which are not wanting in dignity, but they offer a less uphill match for our own time. We must of course accept a common ground for comparison, for Gothic architecture was almost unknown in the eighteenth century, though an exception to this statement might be made in the case of the architect Essex. Limiting the inquiry, therefore, to the revived classical styles, the names of Lord Burlington and his friend Kent, and Kent's pupils Inigo Jones and Vardi—the latter the builder of Spenser House in the Green Park—the younger Dance, Sir William Chambers and James Gandon, the architect of the Four Courts in Dublin, are distinguished as being the first to receive the architectural gold medal of the Royal Academy, stand out pre-eminently. There is a simplicity and fitness for its purpose about Dance's principal works, Newgate and St. Luke's Hospital, which are worthy of being carefully noted. Sir William Chambers's great work, Somerset House, notwithstanding many effective new buildings on the Embankment, maintains its pre-eminence, and the Strand front and entrance may still be said to "hold the record" of similar combinations.

A little later in the century lived Wood, the architect of the new, whose palatial building of Prior Park is one of the ornaments of the eighteenth century; also James Wyatt, a man of versatile genius, and Robert Adam have left works of merit. At the turn of the century came Sir John Soane, whose most remarkable design, the Bank of England, has the merit of being thoroughly characteristic of the purpose of the building, flowing in this the spirit of his master, the younger Dance.

The British Architects of this Century.

When we come down to more recent times, by which I mean the first quarter of the present century, I find among the names of the architects some whom I myself remember when I settled in London as a pupil to Edward Blore in 1836. One of my first memories was the exhibition of the designs for the new Parliament Houses. They were exhibited in the rooms in Trafalgar Square, which had only lately been completed and had not yet been assigned to the Royal Academy, whose exhibition for that year was still held at Somerset House. Sir Charles Barry's design was approached by no rival. Some drawings were indeed sent in by Cockerell, but he had evidently not entered seriously into the struggle. Blore did not compete. So far as my judgment at that time can be trusted, the best of the unsuccessful designs was by Basevi. Besides the four just mentioned, the names I recall as the leading London architects were Samuel Angell, Tite, Hardwick, Sydney Smirke, Donaldson, Salvin; and, as a writer, Gwilt. For Sir John Soane, Sir Robert Smirke, Wilkins, Inwood and Decimus Burton, though living, belonged to an earlier decade; Thomas Henry Wyatt, Sir George Gilbert Scott and Sir James Pennethorne had scarcely at that time made their mark, and William Burn was just migrating to London from Scotland. I omit Augustus Welby Northmore Pugin, who, as far as the competition for the Parliament Houses was concerned, was, as it was already known, giving his assistance to Barry.

At the time to which I refer I consider that, with the exception of Pugin, Blore was the only architect who was quite at home in the detail of Gothic architecture. The full development of the revival had not come in, and it was the "day of small things;" but whilst we may reasonably complain of a want of massiveness for the most part in his works, there is a sense of elegance about his buildings which raises them above the level of the majority of the contemporary works of the Gothic revival. There are not many of his buildings in London. The exterior of the church of St. Thomas Charterhouse, in Goswell Road, may be cited as a good specimen, allowance being made for the decay of the Bath stone used in the decorative parts, the inability of which material to resist the London atmosphere was not so fully recognised then as it has been since.

Among the best buildings of the same period are two works by Shaw—the hall of Christ's Hospital and the tower of St. Dunstan's-in-the-West; fortunately a better stone was used in their construction.

The first place in the period which I am considering—for I purposely do not refer to the names of men who, like William Burges and George Edmund Street, attained such distinction during the second half of this century—must be assigned to Sir Charles Barry, not only on account of his great work, the Parliament Houses, in which, whatever amount of freedom in detail he may have allowed to his coadjutor Pugin, his great power of dealing with the masses was conspicuously his own. But independently of this, the Reform and Travellers' Clubs and Bridgewater House, to mention no other of his works, suffice to secure him this position. Barry was a man of extraordinary energy, of unwearied industry and of a powerful presence, qualities of the utmost importance to anyone engaged in works of such a scale as those which were entrusted to him, especially when combined with a courteous manner, of which I personally had the highest appreciation when he was on the committee assisting Dean Milman in the works intended for the completion of St. Paul's Cathedral.

The man of greatest distinction after Sir Charles Barry was unquestionably Professor Cockerell, a name deservedly revered and honoured, whose buildings include some of very great merit. Cockerell laid the foundation of the classical expression found in his works by an exhaustive study of Greek remains, of which he was an eminent and ardent explorer in days when such investigations were rare, and attended often with "perils from waters and with perils from robbers," in days when communications were very difficult. His fame would be considerable if it rested only on his published works. When he returned to England he entered heartily into the then fashionable Greek revival, and so far as it was possible to adapt the limited range not of its teaching, but of its available precedents, to modern practice, he succeeded—a claim which can be made for no other architect of our time but one, Schinkel, of Berlin.

Cockerell excelled as a draughtsman and was no mean sculptor. He himself modelled much of the ornament which he introduced into his works, and his mouldings are always examples of appropriate profile. These details and the propriety of their subordination to the whole, in addition to the sense of harmony and proportion which prevails throughout, are objects particularly worthy of study in his works. In London the Sun Fire Office near the Bank of England, and at Oxford the Taylor Museum, are buildings which will preserve his reputation as an architect. His lovable nature—

Not being less but more than all

The gentleness he seemed to be—

is still dominant in the remembrance of those who had the privilege to know him, but their number is now greatly reduced. There are, however, not wanting here those who can remember his son, which will help them in imagining what the father must have been. His admirable lectures delivered at the Royal Academy cannot but have produced good results on those who heard them. Both in Cockerell's works and in those of Barry will be found the same qualities of proportion and subordination of ornament which are conspicuous in the works of Sir Christopher Wren and architects of his school.

Nearly contemporary with Cockerell as a Greek explorer was Donaldson, the chief pillar of the Institute at its commencement. There is not much of executed building by him to which I need draw your attention, but he was an admirable instructor, and many of our present members owe much to him from his lectures at University College. He, too, has left a long-enduring memory of a kind and sympathising nature, and while mentioning Donaldson I cannot but refer to the three Papworths, father and sons, the last of whom has been borne to his grave since we last met in this room. The names of John and Wyatt Papworth, devoted supporters and benefactors of the Institute, must always be associated with its library, and that of the younger of the two with "The Dictionary of Architecture," for which he was a laborious worker, and the completion of which he, as its editor, happily lived to witness. I shall ask you presently, colleagues and gentlemen, to cause to be recorded upon the minutes of this meeting our sense of the loss sustained by the death of Wyatt Papworth.

To continue. Gandy Deering, himself a Greek explorer, having been engaged in that service by the Society of Dilettanti, exhibited much skill in his use of Greek elements, but for the most part the Greek revival did not and could not succeed, and it helped to bring on the Gothic revival, which apparently is also losing its vitality. Some good works, in which Greek detail is not so evident, were, however, produced about the same time, such as Arthur's Club-house and Basevi's Fitzwilliam Museum at Cambridge, the latter being left unfinished when Basevi met his death by a sad accident in Ely Cathedral, the building being completed by Cockerell, but the interior has been much altered since those days.

The most remarkable building of this period (if we exclude the Houses of Parliament, the style of which does not lend itself to the comparison) is St. George's Hall, Liverpool. The younger Elmes, who was the architect, did not live to finish the building, and after some delay Cockerell was appointed to complete the work. It appears that Elmes had left full instructions for its completion, but these documents had been lost or mislaid, so that when Cockerell came upon the work he had nothing to guide him but the shell of the building. The entire finishings as executed are by Cockerell's hand, but there can be no doubt that in every respect he loyally carried out Elmes's intentions so far as they could be gathered, and the harmonious result shows that he must have succeeded in practically doing so. The external approaches to the hall were worked out and finished with great care by Cockerell; these, however, have been since subjected to considerable alteration by others.

Proportion in Preference to Picturesqueness.

I have now carried the summary far enough, and shall not particularise any very recent buildings; and for the purpose in view, that is, the comparison of what was done in the seventeenth and eighteenth centuries with the works of the present time, there is no necessity for my doing so. Carried down to the extent it has been, we have found in Sir Charles Barry's and Professor Cockerell's works the same loyalty to the principles of subordination and proportion that prevailed in the days of Inigo Jones and Wren. But latterly they seem to have been too much lost sight of. Both the Greek and Gothic revivals have had the effect of bringing into contempt the precedents of Palladio and the great Italian authorities, and misinterpreted as the spirit of their rules often was, there was some reason in this reaction, for as far as such rules were supposed to supply the place of genius and thought, they were indeed fetters instead of helpers. That genius and thought could be replaced by rules of any kind was certainly a mistaken view. Followed as Palladian precedents and principles were by men like Inigo Jones, Wren and Chambers, as the language with which their thoughts were to be clothed, they had the same value in architecture that metre has in poetry. The license which is now too frequently taken with forms and features long recognised as essential, in favour of a treatment of which the final aim is picturesqueness, can hardly ever produce a satisfactory effect from all points of view. I do not hesitate, however, to allow that pleasing effects do, as it were, accidentally occur; and that we do not, in streets where architects have scope allowed them, see monotonous frontages of the class of Gower Street and Wimpole Street—such as were general at the beginning of the century, though even to them some excuse must be granted. Those were hard times when the country was struggling in a great war for very life, and severe economy in building was then much more insisted upon than it has been of late; and had that restriction not happily

been relieved, there could not have been employment for more than about one-tenth of the number who are at present enrolled in the profession. The relaxation of architectural discipline, however, was not a necessary element in the result referred to, for quite sufficient variety and of a better quality can be obtained by proper study without ignoring accepted precedents or neglecting principles of still greater value namely, proportional relations of contiguous parts and subordination of details to the purposes for which they serve and to the general effect. My predecessor in this chair insisted so well and so emphatically on the evil of redundant ornamentation that I should only weaken what he so well urged were I to say more than that I heartily agree with every word he uttered or the subject in his last annual address to the Institute.

Dean GREGORY (Dean of St. Paul's) said he rose with great pleasure to propose a hearty vote of thanks to the President for his address. All, whether students of architecture or—as he described himself—one ignorant of architecture, must have felt indebted to the President for his address. If he were a professional architect he might essay criticism if there were an opening for it, but he was not going to attempt any criticism. He congratulated the Institute on the rapid and large increase in membership. They as architects were very prosperous, unless the general body of them had only a limited practice. A vast amount of buildings were being erected, but there was too often little beauty about them. The public would not spend more money than they could help on buildings, and further they were often handicapped by the cost of land. In his own profession here was employment for many, but remuneration was very limited. There was a hidden work—one that did not show—one that had caused him trouble—drains. Architects did not look after them till they were all finished. The revision of drains cost the unfortunate owners or occupiers an immense sum to have them reconstructed. With regard to St. Paul's they had been told they should wash the exterior thoroughly. Of all the silly suggestions he had heard for a long time, that was the silliest. The letters in the papers, he had thought, had not required answering. He and his predecessor, the late Dean Church, had carefully inspected the treatment of other buildings by washing, and it struck him that they looked like streaky bacon. All acquainted with ancient buildings, and aware of how they should look, would condemn any such treatment. Twenty-six years ago he was appointed to the canonry of St. Paul's. He went to Italy to visit the churches and learn, if possible, what should be done with the interior. The Dean then referred with praise to Mr. W. B. Richmond's work, but added that it could not properly be judged of until the scaffolding was removed from the chancel, which would not take place for two years. He thought it a scandal that a building so purposely constructed for decoration as St. Paul's Cathedral had been, was left for 200 years undecorated, though possibly that was an advantage, as there were better artists now.

Mr. ALMA-TADEMA said he was very proud to be called on to second the vote of thanks to the President, who was the great Athenian scholar. On questions of art he expressed his opinion that in Universities and in the very best of schools, even of the highest class, art education did not receive the amount of attention that the subject required.

The PRESIDENT returned thanks, and a vote of condolence having been passed to the widow and family of the late Wyatt Papworth, the proceedings terminated.

EXCAVATIONS IN CYPRUS.

THE following interesting account of recent discoveries made by Dr. Max Ohnefalsch-Richter in Cyprus, under a commission from the German Emperor, has been contributed by him to the *Times* :—

It was Sir Henry Bulwer, former High Commissioner, who gave the impulse to the German explorations in Cyprus. True to the traditions of his family, he has always taken a very deep interest in scientific investigations. When he heard, for reasons which I cannot state here, I had been shut out from the more extensive excavations in Cyprus, begun by the British in 1888, he advised me to try Berlin. He saw how rich Cyprus was in antiquities and that there was plenty of room for more workers. It was his principle to encourage all systematically-conducted excavations under the authority of learned bodies, museums or Ministries of Instruction (to what ever country they belonged), and to forbid all private excavations undertaken with a view to individual gains. If the British alone were allowed to excavate, the number of genuine workers would not be great enough to check underhand lawless plunder, and to keep up a large police force would be too costly. Besides, an extension of the permission to excavate would, without extra outlay, bring to the Government of Cyprus and to the flourishing Cyprus Museum in Nicosia rich acquisitions. For by the law as it at present stands one-third of the finds on private land and two-thirds on State land fall to the Cyprus Government, and these shares must be brought to Nicosia and delivered up.

The researches in the kingdom of Tamassos were undertaken by the General Administration of the Royal Berlin Museums, and I was responsible to the General Director Geheimath Schöne. The researches in the kingdom of Idalion were directly commissioned by His Majesty the Emperor, and my immediate superior is his Excellency Dr. Bosse, Secretary of State for Public Instruction. I have always enjoyed special encouragement from Dr. A. Furtwaengler, of the Berlin University and Berlin Museum, now called to the Munich University and Munich Museum as successor to the famous Professor H. Brunn. Dr. Furtwaengler was sent to Cyprus in 1889 and 1894 on behalf of the Prussian Government to superintend my work and arrange for the partition of the antiquities.

The collected results of investigations in Tamassos and Idalion (with some additions from other parts of the island) are to be published in 1895 by Giesecke and Devrient, in a richly illustrated work entitled "Tamassos und Idalion." For this work His Majesty the German Emperor has allowed a considerable sum of money. I shall publish the work in collaboration with Professor Furtwaengler. Other contributors to the work are Professor R. Virchow (Berlin), H. Weeren (Berlin-Charlottenburg), W. Deecke (Buchweiler), J. Euting (Strasbourg), R. Meister (Leipzig), Dr. W. von Landau (Berlin), and possibly also Dr. Dörpfeld (Athens).

The most interesting fact connected with the two kingdoms of Tamassos and Idalion is that within their compass are found remains of so many different periods of civilisation, from the earliest to the late Roman or Byzantine times. Therefore a work treating of these two sites amounts to an essay on Cyprian civilisation and art. Assuming this to be so, the different periods will be much better understood by reference to the plates showing form in pottery, which reproduce the most characteristic and least fragile of the terra-cotta vessels.

In Tamassos the excavations began in the Necropoleis. The oldest field of graves runs right up to the southern edge of the tower of Tamassos, and is situated on the slope of a hill named Lamberti. The remains in it belong to the bronze, but not to the copper period. The oldest strata of all, which appear in their full purity near Idalion at Alambra Mavragi, are here absent. At the period to which the oldest graves of Tamassos belong, as in Hissarlik, pottery is still unpainted, and this is one of the most striking features of resemblance between Cyprus pottery of this kind and that found in the lowest strata of Troy-Hissarlik. In the tombs of Lamberti vessels are painted and made by hand, not on the potter's wheel. The earliest wheel-turned vessels which appear in the Cyprian bronze period are the so-called Mycenæ vases, probably originally imported and then imitated on the island. The potter's wheel first appears in the period of transition between iron and bronze, when Greeks and Phœnicians are known to have been settled on the island. The finds at Tamassos belonging to this stratum consist of clay vessels, stone utensils, bronze and copper objects and glazed beads were very numerous. Silver was rare, gold still rarer. Only two gold bracelets were found, and they were exactly like Trojan gold bracelets. In general the evidence of the remains goes to prove that the oldest Cyprian population was settled in the north and west, not in the south-east. The earliest immigrants to Cyprus had nothing to do with Egypt, Syria, Mesopotamia or the Semites. They belonged to the same group of races as the original inhabitants of Southern, Central and perhaps Northern Europe, and if we name them at all we must call them Indo-Europeans. The English scholar, J. L. Myers, has recently given valuable testimony in favour of this view. They were an agricultural race, who, as discoveries show, lived only in the fruitful and well-watered plains. In almost every tomb are found the customary milk-pans and milking-vessels, and each of the early settlements is marked by a heap of grindstones for corn.

At Tamassos I found some of these stones with the corpses in the graves. About the middle of the second century B.C., or perhaps earlier, the trade with Egypt began. After this green-glazed clay amulets, Egyptian scarabs and ivory occur.

The most unique example of pottery of this period is an amphora-shaped vase, burnt and painted, found at Tamassos, the two handles of which are formed by two dogs springing up among the vases represented in the wall-painting on the tomb of Rokhmara, king of Egypt, as being presented by the Kefa Thothmes III., is one so very similar to this that there can be no question of chance. We must conclude that there was free communication between Cyprus and Egypt. Probably the Kefa brought vases like this, made in Cyprus, as a tribute to the Egyptian kings. In the same tombs I found a multitude of peculiar bronze pins with mushroom-shaped heads and a rectangular slit in the upper part. Flinders Petrie found many of this kind in Egypt, and has already referred to the Cyprus finds (although without accurate reports as a basis), and proposed to use them as evidence of date. These pins belong to the same period in both places.

In this campaign I found no early Babylonian or Assyrian objects in Idalion or Tamassos. But in the necropolis at Ayia Triakhevi, excavated by Mr. J. L. Myers, I found in December

1884, for the Cyprus Museum, a real Babylonio-Assyrian cylinder mounted in gold and inscribed in cuneiform character. The late Assyriologist, S. Birch, dated the cylinder before 1500 B.C., A. H. Sayce before 2000 B.C. Whether, as some have supposed probable, Argon I. undertook a campaign against Cyprus, and whether Sargon I. must really be dated about 3800 B.C., can only be decided by more evidence from cuneiform inscriptions. The cylinder of Sargon I. and his son Naram-Sin was found in Cyprus; but, unfortunately, no trustworthy archaeologist was present at the excavation.

Another important epoch, remains of which I have identified at Tamassos and Idalion, is the great Mycenæan period, when Peloponnesian Greeks first came as adventurers and mercenary soldiers to the further East and Egypt, to appear later as a successful, independent, warlike and conquering Power. Our work, "Tamassos und Idalion," will treat specially of this interesting page of Oriental history in which Cyprus is closely concerned.

The monuments of the Græco-Phœnician period at Tamassos and Idalion are of great interest. The theory so rife among older authors that the Phœnicians from the earliest times were masters of the sea must now be abandoned. It was only at the beginning of the second century B.C. that the Phœnicians extended their numerous factories and threads of connection over the whole of the then known world. This period falls into several divisions, but the Phœnician element never appears pure—always mingled with Greek influence. Valuable remains of it exist in Tamassos and Idalion. This is the period of Homer and his lays. The influence of Homeric customs lasts several centuries. When discoveries from Homeric times are not forthcoming, we must interpret Homer in the light of discoveries from the ages during which the influence of Homeric culture was still felt. This was the plan followed by Helbig in his "Das Homerische Epos," and I supplied him with a mass of material for his second edition.

From the discoveries made at Tamassos for the Royal Museums I select only one example for mention, viz. a mighty sword of iron now in Cambridge, England. When the finds were divided the sword fell to the share of his Beatitude the Archbishop Sophronios, and it was sold by him with other things to Sir Henry Bulwer, who presented it to the museum at Cambridge. I excavated the sword in one of the kings' graves near Tamassos. It certainly belongs to the sixth century B.C. It is the first known instance of a sword adorned with silver bosses such as Homer describes. In the massive handle, fitted with ivory scales, I found the bronze sword-nails with silver heads still in their places. In shape the sword was the same as the one excavated by Schliemann on the Acropolis of Mycenæ. In the same royal tomb I found, in addition to numerous other bronzes, a helmet with a ball-top and cheek pieces (now in Berlin), and a sword-nail with a gold head, probably belonging to a still finer gala sword, which must have been taken away in very early times. Homer says that Agamemnon's sword was studded with golden nails. My discoveries, now in Cambridge, including the sword and the sword-nail, are briefly described in the London *Academy*, but their meaning seems to have escaped the writer of the notice.

Side by side with the Homeric lays, the early national Epos of the Aryan Greeks towers its great Oriental Semitic counterpart, the Old Testament of the Hebrews.

It was no great wonder that in Cyprus, so early colonised by Greeks and Phœnicians, many discoveries were made which help to explain the Old Testament. In my recent work, "Kypros, the Bible and Homer" (published by Asher & Co., London, 1893), I treated the subject fully. I will here notice only one discovery made by me a few weeks ago on the Eastern Acropolis of Idalion. Among the female trinkets spoken of in the Old Testament the Nezem, or nose-ring, occurs very frequently. I have been so fortunate as to be able to identify in Cyprus this strange ornament hitherto unknown in Eastern archaeology. One of the heads of the clay figures which were set up in the enclosure for votive offerings belonging to the sanctuary of Aphrodite wears the nose-ring. This will be published in our forthcoming work. Among the Græco-Phœnician finds from the graves of Tamassos may be noted some fine engraved gems and glass pastes in silver and gold swivel rings, among the designs being a scene of war-chariots and the "exposition" of a corpse surrounded by genii; a silver kylix, with a beautifully-modelled relief in the centre representing a horse walking (Cyprus Museum); several pairs of large gold earrings with fine pendants shaped like berries and recalling Homer's "mulberry" earring; a cornelian carved in the form of a sparrow-hawk and heavily set in gold (also in Nicosia). Among the bronzes were some beautifully stylised pitchers, cups, candelabra, and more important still, fragments of bronze coats of mail with engraved designs, one of them representing a striding figure in Egyptian taste (Berlin). Among the objects made of iron there are, besides the swords already mentioned, a knife with an ivory handle and the representation of a dog in Assyrian taste, and a number of mighty javelins (wrongly

called prongs for roasting meat). Among the vases a conspicuous place is taken by a valuable imported black-figured Attic amphora, the work either of Amasis, the well-known Greek vase-painter, or of one of his most skilful pupils. A comparison with other vases known to be by Amasis will suffice to substantiate this conclusion. The vase is in the Cyprus Museum.

A very beautiful object was found in a stone chest walled in above the finest royal tomb (No. 5, Section IV.), and now in the Cyprus Museum. It is of late Hellenistic date and may serve to represent the more recent stratum. This is a gold chain of marvellously fine workmanship, made in a complicated knotted pattern and ending in two charming female heads. There can be no doubt about the date, although if we were to decide by workmanship alone, we should be tempted to place it earlier. The chain must have lain round the neck of the corpse, and at the side of the head, near the ears, lay ornaments in the shape of flying Erotes, an earring-motive which has long been known to belong to late Hellenistic times. Near the mouth lay two obols, one of them a bronze coin of an early Roman emperor, the other a coin of one of the later Ptolemies.

The most important German discovery in Tamassos consists of three royal tombs, two of them approached by steps, the third by a sloping road or dromos about 60 feet long. In making these graves the soil was first taken away till sufficient space was emptied, and then the masonry was built in. The inner coating of the tombs and the pointed roofs of all three are made of carefully-hewn blocks of stones. The blocks for the roofs are of colossal dimensions. The inner walls are all the visitor sees. They are made of uncemented blocks laid one on the other, and rivetted together inside by large leaden bolts. The space between the masonry and the soil is filled up with broken bits and rough stones fastened together with lime mortar. The same materials were placed over the roofs. The tomb without a stair is sunk deeper than the other two. It is also the largest and roomiest of the three, and has a roof like a church. The approach, of 60 feet in length, is simply dug in the earth, and leads slanting down to a large entrance-court paved with flagstones. All along each side the approach is lined with a massive wall.

In this "Dromos" grave the door is not ornamented, and is closed by a massive flagstone.

The graves with steps are much richer. The smaller one consists of a single chamber. The sarcophagus in which the prince was buried was placed at the inner end of the chamber. Here the entrance is ornamented with a toothed edge, and flanked by two pilasters, which rise directly from the stone floor, but end above in capitals with snail-shell volutes. In the third grave, which is architectonically the richest, and contains two chambers, there are similar capitals, with the snail-shell volutes growing out of a triangle.

The large stone tomb with the dromos had been plundered, probably only once, on account of the gold and silver objects and the engraved gems. The spoliation not being complete, we were able to bring away a number of ornaments, among them some gems, two of which were set in rings, one of gold, one a silver swivel ring. The grave with one chamber and flight of steps had been completely denuded of gold and silver, with the exception of the gold sword-nail already spoken of, and a silver kylix of half-spherical form; but almost all the bronze and iron objects had been left.

The grave with two chambers and a flight of steps must have been plundered several times, even as late as the period when bronze was so much in request. Nothing was left but common clay ware. The architecture is very interesting, for it directly imitates in stone the construction of wood, a procedure almost without parallel. We first enter a kind of porch formed of a flat roof of beams laid close together, supported by Ionicised capitals and pilasters. Passing through this we enter the tomb chambers, the first a large roomy ante-chamber, the second the funeral chamber properly so called, containing a mound on which the sarcophagus is placed. While the funeral chamber produces an effect of simple massive dignity, the porch is adorned with every kind of design. Over the entrance door and the door into the funeral chamber are blind windows with richly-carved and decorated sills in wood technique imitated in stone. Windows of corresponding shape and size can be bought to-day in the villages. I bought one with shutters in Lapithos. When the shutters are shut they look just like the antique imitations in the royal tomb. In our publication we give an illustration of the modern window. The ornaments which repeat themselves in the antique window-sills may be seen in the votive capitals and votive stelai on the Acropolis of Idalion. The design is formed of triangles, out of which grow above palmettes; below, snail-shells. A horizontal plaque finishes it off. In the triangles are sun and half-moon or a head of Hathor; in the space between the volutes of the palmettes is a bunch of lotus-buds and flowers, with or without smaller palmette blossoms. Besides the richly-ornamented windows over the real doors in our Tamassos tomb a massive blind door is constructed on each side of the rectangular

front porch, and is represented as if barred. The massive bolt drawn forward, just as it is in reality in a modern peasant's house and in the house where I live. My publication will contain representation of a modern peasant's bolt of this kind.

The roofing of the porch is very elaborate, and consists of rafters curiously knitted together with boards. A complicated wood construction is here imitated in stone. Lastly, on the entrance-door a wooden lock is imitated in stone. The same things occur in the smaller stone tomb. Wooden locks exact like the ancient ones are to be seen in numbers in the villages of the island. In modern peasant houses at Karpas I found surprising parallels to the pilasters and capitals with snail-shell volutes, which have their broad sides in one line of direction not with the façade, but with the door-jambs. These explain themselves from the roof construction as a whole.

I excavated two more sanctuaries in Tamassos, for the Royal Museums. The first, dedicated to the Mother of the God was a very primitive one within the town. Only small votive offerings were found here, statuettes of clay and stone, and one Greek dedicatory inscription applied to the edge of a vessel.

The other sanctuary lies outside the town, on the river Pidas (the Pedaïos of the ancients); between two villages, and was dedicated to Apollo. L. Ross mentions the site in the record of his travels, and I was fortunate enough to identify it. Some time before his arrival a life-size bronze statue had been found, hewn in pieces, and sold separately by weight as old bronze. On the same site I excavated two very peculiar archaic bronze statuettes. The larger, now in Berlin, is of good workmanship, and wears a helmet; the smaller, of rougher execution, with an Egyptian head-cloth, is in a private collection at Nicosia. The larger one recalls in position and attitude the so-called Apollo figures, such as those of Boeotia. I also found remains of life-size bronze statues, a headless stone colossal draped figure of Hellenistic period, and, finally, a stone four-horsed chariot from the period of Pheidias. This was much defaced by the river water.

I was obliged to give up my excavation in consequence of a sudden tempest of rain, which flooded and washed away what had already dug out of the bed of the river, thus annihilating the results of my labour.

In Idalion we first examined the field of tombs surrounding the town. Among the finds I am inclined to lay special stress on some archaic gold leaves belonging to breastplates and decorated with sunk impressions representing a corn divinity. The eyes are closed as in figures on Mycenaean gold ornaments. The god protrudes his tongue and wears a crown of corn ears and a long garment with a tasselled girdle. His arms are extended and so are the hands, which hold ears of corn. To judge by the clay vessels found in it the tomb is certainly older than 600 B.C. These golden breastplates were sent with the other contents of the tomb to Berlin.

The other grave (No. 26) fell to the share of the Cyprus Museum. Among the ornamental objects, I may mention a silver swivel ring with a scaraboid, on which a lyre is engraved set in gold.

In the same stratum of discovery in Idalion, Tamassos and other parts of Cyprus appear antique fibulae, mostly of bronze, more rarely of silver, more rarely still of gold. In a similar tomb at Idalion lay two small elongated fibulae of silver in shape and size like our modern safety-pins, and also a large bronze bow-shaped fibula.

Among the tomb discoveries was a small aryballos made of green-glazed clay, and interesting because of its rarity. It is in the form of a double head, one being male and bearded, the other female.

Among the clay vessels were again some imported from Athens—e.g. an aryballos in the form of a female head and a small pipkin with an ancient Greek inscription scratched on it. A Cyprian shell lamp bears a long-scratched inscription in the Cyprian syllabary character.

Among indigenous vases I was struck by a kylix with a metope-like painting on the shoulder in a design of rosettes and birds. This seems to be an attempt to imitate a Dipylos type.

The underground royal graves at Tamassos, with all their splendour of architecture, bronzes, weapons and ornaments, find a brilliant counterpart in the principal sanctuary of the Idalion Aphrodite on its proud mountain height. The present writer was the discoverer of this sanctuary. The site of the ancient town of Idalion had been ascertained by L. Ross with approximate correctness. Its natural situation on two hills was the occasion of the existence of two acropoleis, an eastern and a western. While I was able to identify a sanctuary of the Idalion Athene on the western acropolis, I succeeded in discovering and partly excavating the sanctuary of Aphrodite on the eastern acropolis. This adjoined the sacred mountain grove in which, according to the legend, Aphrodite met her lover Adonis. The whole sacred wood originally lay outside the town, stretching far along the chain of hills which begins with the hill of the eastern acropolis. It was only in later times, although certainly not later than the fourth century, that the

high altar and part of the mountain wood containing a space for votive gifts were enclosed, thus forming a smaller precinct entirely within the surrounding city wall, perhaps about 125 m. long and 85 m. broad. This newly-formed Aphrodite precinct was guarded by a formidable rampart of masonry and earth, in itself sufficient evidence for the high estimation in which the Aphrodite shrine was still held. It is true that not much respect was paid to the older gifts of piety. The larger stone votive offerings of former centuries were simply cleared away and built into the fortifications. Consequently, when we began to excavate we were obliged not only to dig out the sanctuary within the rampart, but to pull down and examine the fortification itself. The most valuable discoveries were made during this process. The rampart consisted of a core of strong masonry, faced with smaller stones and covered with a mound of earth. Among the remains built into this structure I must speak first of some capitals of a peculiar kind. Thirteen of these are in fairly good preservation, and there are smaller fragments of as many more. Although all these capitals are worked in the same style, they differ in size, excellence of technique and detail of ornament. They are all tall, wide and thin, and only worked on one side. The height varies from 70 cm. to a metre, while the thickness fluctuates between 10 and 15 cm. Some few fragments are as thick as 35 cm., and seem to belong to capitals about 2 metres in height. On the upper and broader side are no traces of any kind which would lead us to suppose that the capitals had been used as structural supports or bases of statues. On the narrower, lower side of each appears a rivet hole. These holes differ in size and depth.

All doubts as to the purpose of these highly-ornamented capitals are set at rest by the discovery of a stele of elongated tabular form 1.47 m. high, which resembles the capitals (a stele of this kind is now in Berlin). Out of a triangle, which is filled in, now with sun and half-moon, and again with a Hathor head, grow downwards and outwards curly snail-shaped volutes, upwards and inwards a rich palmette ornament. Up above the triangle the centre within the palmette is filled with various decorative designs—lotus buds and flowers and palmette blossoms.

One of the less important finds in the stratum of ashes on a primitive altar site within the fortification was a small flat four-cornered, board-like votive pillar of clay, only 11.7 mm high. It ends at the top in snail volutes, and has holes by which it was hung up in the sacred place. As in the large capitals, the upper, narrow side is plain, while in the lower a rivet hole is indicated. This must be a reduced copy of a votive pillar complete in itself. All these objects, the capitals, pillars and tablets—the larger of stone, the smaller of clay—are merely different forms of votive stelai, which, like statues and statuettes of gods, men and beasts, were set up in the sanctuary. Dr. W. Dörpfeld drew my attention to the votive capitals for the support of statues found on the Acropolis of Athens. In this case the statues are missing, and the capitals themselves serve as votive gifts. Some interesting sculptures were found in the fortifications. Among them is a goddess enthroned, almost life-size, a Sphinx seated on her throne. The style is archaic, but evidently under Greek influence. This splendid piece of sculpture is now in the Berlin Museum. A torso of a woman in the well-known "Spes" motive is purely Greek archaic. The workmanship is very exact and recalls the replicas found on the Acropolis of Athens. At the partition the torso fell to the share of the Prussian Government, as did also an almost life-size crowned female head in Greek archaic style, while another head of similar style but wearing a high coil fell to the owner of the soil. Within the fortifications we struck, as it seems, three kinds of masonry. The lowest layer of wall is of a very primitive kind, consisting of large air-dried bricks, first recognised as such by the penetrating eye of Professor A. Furtwängler. Close to this layer of bricks above and below were two layers which contained sculptures. The stratum of discovery under the air-dried bricks was small in extent and noticeable for a great quantity of charcoal and ashes from burnt sacrifices. In this layer of burnt remains, as in the altis of Olympia, there were found many small terra-cottas either rudely worked in the "Snowman" technique or better executed, but still very archaic in style. The standing figures were male and female; one was suckling a child, another played the double flute. There were besides a fragment of a figure seated on a throne, remains of war and processional chariots, horses, horsemen, an ox, a lion and a goat. A great number of birds were found, some of them richly painted and better modelled. Strangely enough there was no representation of the dove, the bird of Aphrodite, but we can clearly identify hens, ducks and geese, and an eagle is distinctly characterised. Among the better executed terra-cottas of antiquated style in this stratum of discovery, the figure of a snake charmer is conspicuous. It is 0.147 m. high. A man in a high cap with the upper lip shaven, but wearing a long rounded beard, stands in a stiff attitude holding two large snakes with both hands against his breast. Eyes, hair, beard

and snakes are painted black, the rest of the figure dark red. Beside the antiquated terra-cottas lay a large mass of small vessels, especially pitchers.

As I describe these votive offerings fully in my coming work I need not enlarge on them here. I may only say that the finds form an essential continuation of those which I discovered in 1885 in the Aphrodite sanctuary north of Idalion, and published in the numerous illustrations of "Kypros, the Bible and Homer." The chief new acquisitions are the remarkable votive pillars and the enthroned goddess with the Sphinx. This sanctuary certainly contains older and more important votive gifts than those found in the temple at Old-Paphos. Professor A. Furtwängler, one of the excavators of Olympia and one of the first archaeologists of the day, who is my collaborateur in the forthcoming work, came to Cyprus just in time to assist at the excavation of the hill, and in fact to direct it. I owe special gratitude to him for the information given on the spot and for many of the most valuable observations.

Unfortunately but a small part of this very promising site could be excavated. We shall not be able to make many definite statements about the ground plan of the buildings until the whole, or at least most, of the hill has been laid bare. To do this about 12,500 metres of soil must be removed. But this much is sure. I have discovered the famous sanctuary of Idalian Aphrodite so much sung by the poets, and the antiquities which it contains are centuries older than the antiquities of Old Paphos. I cannot be grateful enough to his Majesty the German Emperor for the generosity with which he has placed German funds at my disposal for the continuance of research in Cyprus. I desire also most sincerely to thank the British Government and its representatives in England and in Cyprus, especially the High Commissioner, Sir W. J. Sendall, the Chief Secretary, H. Thompson, and the commissioners, M. King and C. D. Cobham, for their liberal aid.

Lastly, I have to thank my wife, who was appointed as my official assistant by the Prussian Minister of Instruction, and to whose skill and energy it is due that my work proceeds with a rapidity and efficiency hitherto unattained.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

AN address was delivered by the President of the Birmingham Architectural Association (Mr. William Henman) on the 2nd inst. relating to the programme for the coming session. In the course of his remarks he referred to the education of the public taste in the matter of architecture. He said that some advance in this direction had during the last few years been undoubtedly made, but that "love of money, which is the root of all evil," and the bane of good architecture not only stifled the art, but disfigured every building with hideous signs and letterings. The time had come when the public should protest against the display of this vulgarity, and local authorities should obtain powers to suppress it, as in old times Acts of Parliament were passed to curb the excessive display of signboards which, compared with modern advertising methods, were greatly to be preferred for their generally artistic treatment and effect. If, instead of detaining students for hours together in overheated and badly-ventilated class-rooms of our schools of art, daubing paints and laboriously stippling, they were frequently conducted through the streets of our cities and towns under the guidance of men of taste, and taught to appreciate the good in architecture, to despise what is base and degrading thereto, to observe the inartistic design of our lamp-posts, street-name plates and other efforts of officialdom, we might hope that the next generation would not be oppressed by so many impetuous painters of mediocrity, or the exhibitions flooded with their puerile productions; but in their place would grow up a healthy majority of men and women, capable of appreciating that which is artistic, who would, at least, insist that our streets should not be made hideous as they are to-day; together with a minority of trained artists who would give suitable expression to the desire for beauty to reign in public places as well as in private houses. Such a revolution in popular artistic perception and work could only be brought about in the course of time. It must necessarily be of slow growth, but if never a voice be raised against the present deplorable state of things it would go from bad to worse. In this age of hurry it was well that some things moved slowly, in the hope that when times were ripe and ideas matured men might rise endowed with power worthily to carry out desired objects. Might this be the case with regard to our much-talked-of Birmingham cathedral, so that when, some years hence, it is proposed to raise a memorial to a good and worthy bishop or honourable and honoured citizen, and it is decided a cathedral shall be built, public appreciation of architecture may be so far advanced that the question will never be raised, as it had been during the last few days, whether it would be practical to "convert a Grecian church into a Gothic cathedral." If the taste and

demands of that day determined that the site of St. Philip's Church should be that of Birmingham's cathedral, then although he gave place to none in reasonable reverence for work of the past, and much admired the tower of that church, he sincerely hoped it would not be allowed to influence the style of a building which must necessarily be of greater importance, nor that it would simply make way for a "Gothic cathedral." He would rather that the inhabitants of the city and neighbourhood would with one voice and open purse demand that the building should be worthy its position, designed by able hands in the best style of the period, whatever that may be, so long as it was neither a mere archaeological compilation of dead bones nor an eccentric novelty devoid of all traditions of architectural propriety.



Glasgow Institute of Architects.

SIR,—In your impression of the 26th ult. a report of a meeting of the Glasgow Institute of Architects appeared, in which it was stated that "there was an opinion abroad that the very large expenditure of money on public buildings was not done in the most judicious way," that the architect had his reputation to sustain, and if employed in public buildings would not be slow to let what light was in him shine forth, and that "surely it would be for the public advantage that architects of the greatest experience should be employed to design and superintend their buildings."

As in this report reference is made to the Lord Provost and the Police Commissioners, it is obvious that the "public buildings" alluded to are those that are designed in the Office of Public Works.

Now of such buildings as are generally designed there there can be no "architects of greater experience" than those who, for half a century, have been specially employed upon them—public buildings principally in connection with the Police Department of the city. The Office of Public Works, created by Mr. Carrick nearly fifty years ago, has a "reputation to sustain," the reputation formed by its great chief, who was an architect that perhaps more than most knew not only how best to plan "public buildings," sufficient for police, but how most economically to expend on those buildings the money of the ratepayers.

The report says that it would be for the public advantage not only that architects of the greatest experience should be employed, but that the architect, having his reputation to sustain, would not be slow to let what light was in him shine forth. To illustrate this, let us look at a public building recently completed by the President of the Institute, and who, when the report was submitted, occupied the chair. On the street level are stunted columns, with an entablature *minus* both architrave and frieze, but with a cornice that, like Cleopatra's person, "beggars all description," while above are Corinthian columns of about a dozen and a half diameters engaged to the wall, and having the entablature broken over each. The grouping of the windows is in twos, a composition than which scarcely any can be worse, if indeed it be composition at all, and, as Burns says, "of whatna date or whatna style" is the termination of the gable it surpasses the wit of man to know or understand. This "pipe-staple" Corinthian column is in even this age of "progress" scarcely an improvement upon the old-fashioned manner of the Lanthorn of Demosthenes or the Temple of Jupiter Stator. The President of the Institute may have a reputation to sustain, and "the light that is in him" may be one that hitherto has not shone upon either sea or shore; it is not, however, a meteoric flash that we would like to see thrown upon even a Glasgow police-office.

Those who live in glass houses ought not themselves to throw stones, and the mouthpiece of the Institute indicates by the building to which I have referred that he is not the critic to speak of "work not done in the most judicious way"—unless, perhaps, that which is done by himself.

Barry in London, in the Reform Club-house, and Thomson in Glasgow, in Great Western Terrace, taught what "architecture" is; but learning doesn't always follow teaching.—I am, sir, your obedient servant,

ÆDILE.

The Building Trade Dispute.

SIR,—I shall be obliged if you will be good enough to insert the following account of this so-called strike in your valuable paper, as it is desirable that the public should be correctly informed of the facts of the case.

Messrs. Trollope had a call from a Mr. Verdon, the secretary of the London Building Trades Federation, one day last week, who complained that at two of their jobs the foremen

had, by declining to employ any but non-Union bricklayers, broken the honourable understanding arrived at between the employers and employed at the time of the settlement of the last strike in the building trade, to the effect that no distinction should be made between Union and non-Union workmen.

Mr. Verdon was informed that he was mistaken as to his facts, but further inquiry would be made. He then demanded that the foreman and certain men who he stated had come from another job and had been mixed up in some dispute—of which Messrs. Trollope then heard for the first time—between another builder and the Trades Unions, should be at once discharged and society men only employed in their place, threatening, if they did not comply, a strike would take place. It was pointed out that, after complaining of an alleged breach of agreement on Messrs. Trollope's part (which, it was subsequently found, had not taken place and Mr. Verdon was so informed), it was hardly reasonable to ask Messrs. Trollope to really commit a breach of faith by acting in the manner he desired and Messrs. Trollope certainly did not intend to do so.

A number of men have rather hastily left Messrs. Trollope's employment, presumably in execution of the threat held out by Mr. Verdon and in support of a course of action on the part of the Trade Societies which causes the outlook to be a very serious one.—I am, Sir, your obedient servant,

R. S. HENSHAW, Secretary.

The Central Association of Master Builders of London,
31 and 32 Bedford Street, Strand, W.C.: November 2.

GENERAL.

Sir John Gilbert, R.A., has intimated to the arts committee of the Blackburn Corporation his intention to present to the borough his painting, *The Baggage Waggon*, and a landscape entitled *Keston Common, Kent*.

Mr. F. H. Rathbone will read a paper at the Liverpool Artists' Club on "The Necessity of Art for the Future Prosperity of Liverpool."

Major Davis, F.S.A., who has been conducting further excavations at Bath, has reported that he had unearthed undoubted proof that the Romans drank as well as bathed in the mineral waters. Old drinking-vessels had been discovered, together with numerous Roman ornaments and coins, alleged to be of the period of Nero. A very remarkable Roman drain, formed of oak and stone, formerly covered in lead, is also among the discoveries.

Dr. W. E. Sumpter, of the Battersea Polytechnic School, London, has been selected by the technical school committee of the Birmingham Corporation from among seventy-five candidates as principal of the new local technical school. The salary is 500*l.* per annum. Dr. Sumpter is a Fellow of the University College, London, and of the City and Guilds of London Institute, a member of the Council of the Physical Society of London, and of the Institute of Electrical Engineers.

Bronze Gates, designed by Mr. B. Champneys, have just been erected, at a cost of over 700*l.*, at what is now the main entrance of Newnham College, Cambridge, under the archway of Pfeiffer Buildings, and on Saturday were formally presented to the Council on behalf of the students of the college, by whom they were given as a memorial of Miss Clough.

The Sedgwick Memorial Museum Syndicate have reported that the cost of the building proposed to be erected in Cambridge exceeds the architect's calculations by the sum of 4,500*l.* They therefore recommend that they be empowered to reconsider the plan approved by the Senate, and, if necessary, to substitute a new one for it, and that they report to the Senate before the end of the ensuing Lent term.

The Artists' Guild on Monday opened their sixth annual show of amateur decorative work at the Royal Albert Hall.

The Duke of Westminster has given the site, and is building at his own expense, at a cost of about 3,000*l.*, a working men's club and institute for Handbridge, a suburb of Chester.

Lord Derby has given to the borough of Bury a plot of land, about 2½ acres in extent, adjoining the Duke of Clarence Recreation Ground, Walmersley Road, Bury, for the purpose of the grounds being enlarged.

Sir D. A. Lange, C.E., died suddenly in London on Friday. He was appointed in 1858 by Said Pasha, Viceroy of Egypt, constructor of the Suez Canal, and was for some years director in England of that work, on the completion of which he received the honour of knighthood from the Queen.

M. Lucien Magne recommenced his course of lectures on "The History of Architecture" at the Ecole des Beaux-Arts on Monday.

Lord Wolseley opened the exhibition of the Dublin Sketching Club on Monday.

The Civil Engineers will assemble in their old meeting-room on Tuesday next, to hear the address of the new President, as the new premises will not be ready for occupation until next year.

The Architect.

THE WEEK.

AN application has been made to the London School Board by the measuring surveyor, Mr. W. MURRAY, for compensation in respect of the overtime which was devoted by him in checking accounts of construction in cases that were under arbitration. "I had no choice," says Mr. MURRAY, "but to spend night after night for months, since the early days of the present Board to within the past few weeks, in getting up the cases for the arbitrator and in endeavouring to settle with the other contractors. To give your committee some idea of the amount of tedious labour involved, I may mention that there were no less than 1,466 items in dispute between the Board and three of your contractors, viz. ATHERTON & LATT, CHARTERIS, and DOVE BROS.; of the items in dispute with the other contractors I have no record, but they would be nearly proportionate. The overtime spent in going through the disputed items and preparing for the arbitrator, of which I have taken note, is 547 hours (equivalent to between sixteen and seventeen weeks' work), but there is a further considerable amount of time spent on going into items in dispute with the contractors who did not resort to arbitration, of which I have no record." The general purposes committee have recommended that 50% be awarded to Mr. MURRAY for his extra services.

THE Leeds School Board, in addition to some ordinary schools, are about to erect a school for blind and deaf-mute children. The basement will be arranged as a swimming-bath, the use of which will not be restricted to the children of the school. On the ground floor will be an assembly hall for the blind children, to be also used as a play-room and gymnasium, seven classrooms, each to accommodate fifteen children, four music-rooms, a work-room, cloak-room, a committee-room, matron's private room and a large dining-hall. On the first floor will be an assembly-hall for deaf-mute children, to be also used as a play-room, eight classrooms, each to accommodate fifteen children, a large work-room, a teacher's bedroom and the blind boys' dormitory. On the second floor will be the blind girls' dormitory, a teacher's bedroom, and a separate sick-room for boys and girls. There will be separate entrances and staircases for each section, and also separate playgrounds. Accommodation will be provided for 225 children (120 deaf-mutes, 105 blind), of whom 108 will be boarders. It is anticipated that the building will be one of the best-arranged of its class in England.

It is, we suppose, natural that the trustees of churches should endeavour to escape the liabilities imposed on them by the law. But the decisions are so definite, trustees may consider there is no opening left for them to evade their responsibilities. One of the latest instances came lately before the Bradford County Court. Mr. HILL, a slater, brought an action against the Rev. G. P. CLARKE, in his capacity of trustee of the Central Hall, Manchester Road, which was erected for Primitive Methodist purposes, to recover the amount of an account. It was not denied that the work had been done, nor that it was not performed in a satisfactory manner. The plaintiff had received the architect's certificate for the work, and the only answer to the claim was that the defendant was instructed that he had a legal defence, and would avail himself of it. The plaintiff stated that 120 yards of slating and 60 yards of eaves had been done over and above the contract, owing to a mistake in quantities. The counsel for the defendant observed that the matter was a serious one, as a sum of 500*l.* or 600*l.* was involved in the issue. He proceeded to argue that the defendant was bound only by the contract which had been executed. Judge GATES said he thought the defence was most unworthy and shabby, and not only that, but there was no defence in point of law. He therefore gave judgment for the plaintiff for the amount claimed. Defendant's counsel asked for leave to appeal, but the Judge, in declining, said

he would be laughed at in the High Court if he gave such leave. On economical grounds it will, therefore, be wiser for the trustees to arrange for the settlement of accounts outside the courts.

THE Corporation of Dublin intend to promote an Improvement Bill in the next session. Among the powers sought will be some for "the erection of a large and commodious public hall for the people of Dublin." The Irish capital is deficient in municipal buildings. The City Hall was erected for a different purpose than the accommodation of a Council and officers. Assuming that the Bill becomes law, a year at least must elapse before any arrangements can be made concerning the proposed building. It may be anticipated, however, that the design will be obtained by competition, and as there are no models available in Ireland, the Corporation cannot of course restrict the contest to local architects. As every visitor to Dublin is aware, the buildings which give interest to the city were the work of English architects.

THE colonnade which used to serve as a screen for the courtyard of Burlington House, before the Royal Academy and the associated societies took possession of the ground, was not very remarkable as a work of architecture, but it had some interest as the supposed work of an amateur, Lord BURLINGTON, and from the numerous references to it in the literature of the eighteenth century. It seems incredible that no place could be discovered for it in the Metropolis, and that the stones are left at Battersea without any protection. There is no doubt they have lost some of their qualities by the rough treatment they receive from children. Mr. W. WHITE, who from his association with Gothic work might be supposed to look on the masonry with unfriendly eyes once tried to rescue the columns. He says:—"On June 1, 1877, I visited them in Battersea Park and made a sketch design for their re-use in a church in the neighbourhood, proposing to employ them for the arcades, or colonnades, of the nave and aisles, using up the whole of the thirty-four columns, with caps and bases. The design was necessarily Italian in character, and not strictly English. The proposal fell through. But there seems no reason why some such scheme should not be set on foot and carried out now. A certain amount of maiming or mutilation in the stones, in order to preserve successfully these records of the past, might well be borne with, so that they were saved from the vandalism of scraping or whitewash." Since that time Classic work has risen in favour, and some effort should be made to utilise the columns. The French would find no difficulty in setting them up in the park in a position where they would enhance the picturesqueness of the grounds.

THE condition of the wall-paintings in the Houses of Parliament is almost enough to deter people from allowing similar attempts to be made in this country. Mr. W. B. RICHMOND says that "The durability of 'fresco,' or for the matter of that of all wall-painting, in whatever medium executed, whether it be size, egg, or even oil, depends upon the absolute dryness of the wall upon which the ground for painting is applied. If architects will give us dry walls, so constructed that damp neither rises, falls, nor penetrates, we can make use again of all the ancient methods of wall-painting with perfect security. If science will give us pure air in London those methods can be used there." In the Houses of Parliament the evil was not caused by damp walls, but rather by unsuitable paints and a defective method of using them. This is evident from the efforts which are being made by Professor CHURCH to make the figures visible. MACLISE'S *Meeting of Wellington and Blucher* and his *Death of Nelson* have had to be sponged and syringed in order to get rid of a coating of sulphate of lime that was formed by chemical action. HERBERT'S *Judgment of Daniel* and *Moses Bringing Down the Tables of the Law* are operated on with linseed oil, and DYCE'S paintings in the Robing Room, which were formerly treated with paraffin wax, will now need some other treatment. If the walls were defective, there would be no need to have so many varieties of restoration.

GIBBON AND ARCHITECTURE.

DURING this week the centenary of the death of EDWARD GIBBON, the historian, is being celebrated in a modest way. A few of his manuscripts, his snuff-box, sword, watch, playing-cards and other things have been collected and are to be seen in the British Museum. Compared with the shows which usually accompany celebrations, the display of relics does not appear of much importance, yet it is significant. Thirty years ago even so slight a commemoration of GIBBON could not be attempted. He was supposed to be the most un-English of all writers. It was asserted that he was afraid to be frank and that his meaning was a puzzle. Critics of repute did not hesitate to say that GIBBON was unable to write an English sentence, and it was proposed that his pages should be offered to students as exercises for translation into English. Then the supposition that his "Decline and Fall" was superficial, if compared with German histories, gave the finishing blow to his reputation. As one of the men whose mission it was to explain how histories should be composed, said, "GIBBON lived, longed, aspired, attempted, worked, slaved hard, wrote, published—and he was flattered, praised, read, bought, republished, perched up for immortality in stucco and in stone; and yet did he go down to the grave profoundly unaware, incurably unqualified to understand what this wreck of civilisation was whereon he has so elaborately pinpicked his name." After a decision of that kind, which expressed a common opinion, who could have expected that a lock of GIBBON'S hair, a caricature or two of him, some of his books of memoranda, letters and manuscripts, would become objects of attraction? The reverence which they have excited is only one of the signs of a reaction. A better knowledge of what can be done in writing history has convinced men that GIBBON is one of the greatest of historians, for he possessed not only the industry which is needed in order to arrive at facts relating to a remote age, but also the rare power which enables a writer to display the difference between the past and the present.

The criticism of an ordinary historian would be out of place in these columns, but there are circumstances connected with GIBBON which warrant an exception for his case. At a time when so many critics are endeavouring to explain why he deserved a "commemoration," it may be allowable to consider the subject from a standpoint that has been overlooked, but which has advantages.

In his fragmentary autobiography, GIBBON is proud to recall that the first member of his family who made a name for himself was an architect. Having mentioned his discovery that in 1326 the GIBBONS possessed an estate in the Weald of Kent, he goes on:—"Fourteen years after the first appearance of his name, JOHN GIBBON is recorded as the 'Marmorarius,' or architect, of King EDWARD III.; the strong and stately castle of Queensborough, which guarded the entrance of the Medway, was a monument of his skill; and the grant of an hereditary toll on the passage from Sandwich to Stowar, in the Isle of Thanet, is the reward of no vulgar artist." In these days when so much importance is attached to the remotest manifestations of heredity, it would be allowable to claim some of the qualities of the fourteenth-century "Marmorarius" for the author of the strong and stately history which above all others in the English language has an architectural character. But we need not contend whether GIBBON exemplifies atavism; all we care to suggest is that the memory of his ancient kinsman was not without extraordinary influence on his life.

Everybody knows how and when the thought came to GIBBON about undertaking his history. His own words are familiar:—"It was at Rome, on October 15, 1764, as I sat musing amidst the ruins of the Capitol, while the bare-footed friars were singing vespers in the Temple of Jupiter, that the idea of writing the decline and fall of the city first started to my mind." It is not, however, generally remembered that the idea was only what might be expected as a consequence of the course of study which GIBBON, in giving way to his own inclination, had gone through, and the task he was inspired to do was more nearly related to the ruins before him than what he realised. GIBBON did not contemplate so comprehensive a work as we now possess. Subjects like the "revolutions of Persia," "origin, progress and effects of the monastic life," "the character and doctrine

of MAHOMET," "origin and doctrine of the Paulicians," "first adventures and settlement of the Normans," "the Crusades," "the schism of the Greeks and Latins," "the character and coronation of PETRARCH," and countless others, by which the history of Europe was brought down to the sixteenth century, represented the growths around his original scheme which almost overshadowed it. What he was inspired to attempt was archaeological rather than political, for he tells us how his "original plan was circumscribed to the decay of the city rather than of the empire," and some years elapsed before he was seriously engaged in the execution of his more laborious undertaking. The ruins and the transformed temples appealed to GIBBON'S sympathies, as they would have to the old "Marmorarius," and he intended to do no more than explain how the changes were accomplished.

But the meditations amidst the ruins of the Capitol were in keeping with GIBBON'S own history. He considered himself to be also a wreck. In 1764 he was in his twenty-seventh year, but he was not without apprehensions about his future and feared that an old age awaited him without the fruits either of industry or inheritance. From his birth he was feeble, but he was a precocious child, and if he were allowed to follow his own bent from the first he might have been better educated. But in spite of his unfitness he was made to follow the common course. He always remembered that in his ninth year his want of strength and activity enabled the bullies of the school to revile and buffet him for the sins of his Tory ancestors. And he relates how, "at the expense of many tears and some blood, I purchased the knowledge of the Latin syntax." GIBBON would have hated Rome and its classics if his aunt had not fostered him. "Pain and languor," he says, "were often soothed by the voice of instruction and amusement; and to her kind lessons I ascribe my early and invincible love of reading, which I would not exchange for the treasures of India." His infirmities afterwards prevented him obtaining any systematic training, and in course of time he arrived at Oxford "with a stock of erudition that might have puzzled a doctor, and a degree of ignorance of which a schoolboy would have been ashamed." An English university in 1752 was about the happiest place for a wealthy young gentleman whose studies were desultory. GIBBON was allowed to do as he wished, and he asserted his independence by becoming a Catholic. Then he was sent to Switzerland where, if he did not regain his orthodoxy, he remedied some of the defects of his education. But on his return he was found to be unfitted to become a country gentleman. "I never handled a gun," he relates, "I seldom mounted a horse, and my philosophic walks were soon terminated by a shady bench." The fear of invasion made lymphatic temperaments like GIBBON'S become ardent, and he served for a time as a captain of militia, not without profit to him afterwards as an historian.

GIBBON was not at ease in England, and he returned to Switzerland on the first opportunity. His own will began to be exercised. The sight of a collection of medals and coins opened for him a new field in which antiquity appeared as a real world, and he resolved to undertake an expedition in which he could study the topography of Rome, the ancient geography of Italy and the science of medals. It was a remarkable desire in a man of his figure, for GIBBON was like HAMLET, fat and scant of breath. He made an itinerary of Italy that resembled one of the English road books, filled a commonplace book with topographical notes and utilised engravings of medals for illustrations. The "tame and tiresome uniformity" of Turin did not satisfy him, nor the marble palaces of Genoa. But in Rome he admits that his passionless mind was agitated from the very moment of his entrance, and several days of intoxication were lost or enjoyed before he could descend to a cool and minute investigation. GIBBON spent eighteen weeks, accompanied by a Scotch antiquary, in examination of remains before he felt himself qualified to select and study examples of art. He was not like one of the ordinary fine gentlemen who performed the Grand Tour. GIBBON was most eager at an early time to obtain some knowledge of the remains of antiquity, but neither in England nor in Switzerland was it practicable. Thus in the French essay on the "Study of Literature," which was his first attempt,

he exclaims, "Why am I not a CAYLUS or a SPENCE? Then would I raise an eternal monument to the alliance of art and literature. In it should be seen the image of JUPITER developing itself in HOMER'S brain and coming to lie beneath the chisel of PHIDIAS. But I cannot with CORREGGIO say to myself, 'I, too, am a painter.'"

His studies had afterwards enabled GIBBON to acquire a knowledge of some kinds of art, and more particularly of architecture, which was deeper than that of CAYLUS or SPENCE. It is still easy to discern in the massive "History of the Decline and Fall of the Roman Empire" traces of the first inspiration of the author. The climax of the work which forms the concluding chapter altogether relates to architecture. He begins by saying that "In the last days of Pope EUGENIUS IV. two of his servants, the learned POGGIUS and a friend, ascended the Capitoline Hill, reposed themselves among the ruins of columns and temples, and viewed from that commanding spot the wide and various prospect of desolation. The place and the object gave ample scope for moralising on the vicissitudes of fortune, which spares neither man nor the proudest of his works, which buries empires and cities in a common grave; and it was agreed that in proportion to her former greatness, the fall of Rome was the more awful and deplorable." Then he goes on to explain how there were four causes of destruction—the injuries of time and nature, the hostile attacks of the barbarians and Christians, the use and abuse of the materials and the domestic quarrels of the Romans. GIBBON was a master of composition and he felt that this picture of the decline and fall would not be effective if it were restricted to mortal beings who cannot be imagined to have more than a brief existence. By making great buildings share in the catastrophe the destructive power appears more terrible and the author's aim as an advocate of pessimism is attained.

To dwell only on buildings in ruins would be monotonous. GIBBON was no less eager to represent them in all their glory. He shows how pride, patriotism, religion and other qualities were expressed by means of architecture, and that accordingly buildings are for the historian the most important of memorials, although so constantly neglected. Thus in one place he says:—"Among the innumerable monuments of architecture constructed by the Romans, how many have escaped the notice of history? How few have resisted the ravages of time and barbarism? And yet even the majestic ruins that are still scattered over Italy and the provinces would be sufficient to prove that those countries were once the seat of a polite and powerful empire. Their greatness alone or their beauty might deserve our attention; but they are rendered more interesting by two important circumstances which connect the agreeable history with the more useful history of human manners. Many of these works were erected at private expense and almost all were intended for public benefit." He gives several examples of the munificence which hesitated at no outlay whenever a public building was to be erected.

In considering his descriptions we should not forget the difficulties which surrounded him. Nowadays, when views of buildings in all parts of the world are to be acquired for a trifle, it is not easy to realise that a century ago a student who was unable to travel could only imagine the appearance of the buildings in his own country. The creative power of a historian will not be of much avail when he treats of architecture. We must therefore often accept GIBBON'S numerous accounts of buildings as tokens of goodwill towards architecture and of his desire to suggest its impressive power rather than as accurate representations. He was enabled by means of ADAM'S engravings to obtain an accurate notion of DIOCLETIAN'S palace at Spalato, and in consequence he was able to give the following description of the group:—

It covered an extent of ground consisting of between nine and ten English acres. The form was quadrangular, flanked with sixteen towers. Two of the sides were near 600 and the other two nearly 700 feet in length. The whole was constructed of a beautiful freestone, extracted from the neighbouring quarries of Trau or Tragutium, and very little inferior to marble itself. Four streets, intersecting each other at right angles, divided the several parts of this great edifice, and the approach to the principal apartment was from a very stately entrance, which is still denominated the Golden Gate. The approach was terminated by a peristylum of granite columns, on one side of which we discover the square Temple of Æsculapius, on the other the octagon Temple of Jupiter. The latter of those deities

Dioctletian revered as the patron of his fortunes, the former as the protector of his health. By comparing the present remains with the precepts of Vitruvius, the several parts of the building, the baths, bedchamber, the atrium, the basilica, and the Cyzicene, Corinthian and Egyptian halls, have been described with some degree of precision, or at least of probability. Their forms were various, their proportions just, but they were all attended with two imperfections, very repugnant to our modern notions of taste and convenience. These stately rooms had neither windows nor chimneys. They were lighted from the top (for the building seems to have consisted of no more than one storey), and they received their heat by the help of pipes that were along the walls. The range of principal apartments was protected towards the south-west by a portico of 517 feet long, which must have formed a very noble and delightful walk, when the beauties of painting and sculpture were added to those of the prospect. Had this magnificent edifice remained in a solitary country, it would have been exposed to the ravages of time; but it might, perhaps, have escaped the rapacious industry of man. The village of Aspalathus, and long afterwards the provincial town of Spalato, have grown out of its ruins. The golden gate now opens into the market-place. St. John the Baptist has usurped the honours of Æsculapius; and the Temple of Jupiter, under the protection of the Virgin, is converted into the cathedral church.

In this case there is as much exactitude as could be expected in a history. The characteristics selected are those which are most likely to impress readers who are not acquainted with the details of architectural styles. It is also made subservient to GIBBON'S endeavour to substantiate a charge of Vandalism against the Christians. Much of the effect in the description of Spalato depends on the big dimensions. Let us take another case, viz. ATTILA'S village and palace, where there were no plans or dimensions to guide GIBBON, and he was compelled to depend on the vague and obscure words of PRISCUS:—

In its origin it could be no more than an accidental camp, which, by the long and frequent residence of Attila, had insensibly swelled into a huge village for the reception of his court, of the troops who followed his person, and of the various multitude of idle or industrious slaves and retainers. The baths constructed by Onegesius were the only edifice of stone; the materials had been transported from Pannonia, and since the adjacent country was destitute even of large timber it may be presumed that the meaner habitations of the royal village consisted of straw, of mud or of canvas. The wooden houses of the more illustrious Huns were built and adorned with rude magnificence, according to the rank, the fortune or the taste of the proprietors. They seem to have been distributed with some degree of order and symmetry, and each spot became more honourable as it approached the person of the sovereign. The palace of Attila, which surpassed all other houses in his dominions, was built entirely of wood and covered an ample space of ground. The outward enclosure was a lofty wall or palisade of smooth square timber, intersected with high towers, but intended rather for ornament than defence. This wall, which seems to have encircled the declivity of a hill, comprehended a great variety of wooden edifices adapted to the uses of royalty. A separate house was assigned to each of the numerous wives of Attila, and instead of the rigid and illiberal confinement imposed by Asiatic jealousy, they politely admitted the Roman ambassadors to their presence, their table and even to the freedom of an innocent embrace. When Maximin offered his presents to Cerca, the principal queen, he admired the singular architecture of her mansion, the height of the round columns, the size and beauty of the wood which was curiously shaped, or turned, or polished, or carved; and his attentive eye was able to discover some taste in the ornaments and some regularity in the proportions.

The latter may be taken as corresponding with the numerous attempts of GIBBON to restore ancient buildings by the aid of insufficient data. In our busy time we are afraid they are the parts of the history which are most often skipped. GIBBON could not expect that many of his contemporaries would take the trouble to peruse them. He possessed a weakness for an ancient building, and it gratified him to attempt descriptions of temples and palaces which he could never expect to behold. In the respect he shows towards architecture EDWARD GIBBON stands almost alone, and on that account we should overlook some of his defects of treatment, for it may be said that he displays far less warmth in describing men than he bestows on buildings. His affection may be judged from the remarkable passage where he becomes an apologist for the cruelty of the Emperor MAJORIAN, because it was exercised on those who destroyed old buildings. He says:—

The monuments of consular or imperial greatness were no longer revered as the immortal glory of the capital, they were only esteemed as an inexhaustible mine of materials cheaper and more convenient than the distant quarry. Specious petitions were continually addressed to the easy magistrates of Rome, which stated the want of stones or bricks for some necessary service; the fairest forms of architecture were rudely defaced for the sake of some paltry or pretended repairs; and the degenerate Romans who converted the spoil to their own emolument, demolished with sacrilegious hands the labours of their

ancestors. Majorian, who had often sighed over the desolation of the city, applied a severe remedy to the growing evil. He reserved to the prince and senate the sole cognisance of the extreme cases which might justify the destruction of an ancient edifice; imposed a fine of fifty pounds of gold (two thousand pounds sterling) on every magistrate who should presume to grant such illegal and scandalous license; and threatened to chastise the criminal obedience of their subordinate officers by a severe whipping and the amputation of both their hands. In the last instance the legislator might seem to forget the proportion of guilt and punishment; but his zeal arose from a generous principle and Majorian was anxious to protect the monuments of those ages in which he would have desired and deserved to live.

GIBBON may have imagined that the Kentish "Marmorarius" would have been no less rigorous.

NOTES ON THE GREAT RAILWAY STATIONS OF LONDON.—III.

[BY A CORRESPONDENT.]

THE terminus of the London, Brighton and South Coast Railway at Victoria has one advantage externally over the neighbouring station, in the fact that attention is diverted from the ugliness of its end by the covered erection for vehicles in front. There is nothing of that kind at the London, Chatham and Dover building. The Grosvenor Hotel also acts as an effectual stop to the northern side of this station, instead of the awkward skew and finish next the Wilton Road to the other example. The mode of roofing employed to the London and Brighton Station is on very different lines to that of some of the other large termini, as the spans are arranged transversely to the axis of the station. The very usual plan of dividing it longitudinally into two equal sections has been adopted, the wreathed columns, carrying brackets with perforated foliated spandrels, standing in the centre of the broad roadway for vehicles, without their in the least getting in the way. The very deep lattice girders on which the roofs pitch form a most conspicuous feature in the design of this station, the braces being very slightly ornamented and having bosses at the intersections. As compared with many of the other examples the height up to the plate is little, and the construction of the roof trusses of a simple and light character. There is nothing objectionable, but on the other hand there is nothing grand within this terminus.

The Charing Cross Station of the South-Eastern Railway is externally nothing more than a huge shed, but the fine Hotel facing the Strand makes an imposing appearance to the entrance front, which is enhanced by the spacious paved yard and the elegant Queen Eleanor Cross, as well as by the handsome, substantial enclosure railings. The west side of the station is little seen from the outside, but that on the east towards Villiers Street is sufficiently apparent. It is windowless, but divided into wide panels with semicircular red brick gauged arches, the whole treated in a simple and effective manner. It is difficult to see how more could have been made of it without a very large expenditure over so extensive a superficial area. The best treatment of blank walls of this kind is no easy matter, and the art is neither to do too little nor too much—there is the rub. The interior of this station is imposing owing entirely to its great width and length, all open to view at one glance. The construction of the iron trusses is wonderfully light and there is no attempt at ornament. Yet withal, the effect is none the worse, for misapplied decoration is no improvement, but the reverse. Moreover, owing to London dirt, steam and smoke any embellishment at so considerable a height would have been positive waste. At the same time, at the point where the roof springs from the walls, the very crude aspect caused by the absence of frieze or cornice here might have been avoided, as any slight ornament set in so legitimate a position would have been well seen. On the east side of the station, where a wing of the Hotel occupies its northernmost end, the way in which the roof is trimmed so as to allow of the insertion of some windows is very awkwardly managed. A Mediæval architect of the olden time would have created a beauty instead of a blemish where he came across any such difficulty. There are hundreds of such examples, still happily existing, of picturesque features originated in this manner. As for the treatment of the side walls with a series of semicircular arched recesses having piers between, any good effect these might have had is

ruined by the whole of the panels being filled in with obtrusive advertisements. But it is useless enlarging on this very patent and universal nuisance. The best part of the station, viewed internally, belongs rather to the Hotel, the south side of which has two balconies on the first-floor level, the projection of which serves much to break the monotony of this end of the building. The blank wall above, up to the ridge of the roof, is also treated in a very simple though effective manner.

What has been remarked about the Charing Cross terminus will to a great extent apply to the Cannon Street Station, as the plan is much the same, with the Hotel on the north side, and belonging to the same railway company, though the dimensions rather exceed the first named. The exterior of the side walls, less seen on the whole than at Charing Cross, are treated in a very similar way, except that there are some windows, and the arches are all in ordinary stock, not red, bricks, the whole being simple and effective, without any affectation of ornament—one of the besetting snares of too many civil engineers. Internally the construction of the roof is very like that at Charing Cross, but instead of the one little panelled wood roof in the centre, there are in this instance two of them, leaving glazing in the highest part. As regards the north end of the station, or south side of the hotel, this is more ornamentally treated and elaborate than at Charing Cross.

When the Victoria terminus of the London, Brighton and South Coast Railway was built it was predicted that London Bridge would become a mere roadside station. As far as the South-Eastern line is concerned, this has to some extent been realised, as can be gathered from the dimensions of the station belonging to that company. But the other company possess an enormous building for the main line and suburban traffic, reconstructed on modern lines. To stand here as a spectator on an ordinary weekday afternoon between five and six o'clock is almost a revelation, to even one accustomed to the traffic at the larger London stations, for there is an incessant stream of City men hurrying or running to save their trains to their suburban homes. It is believed that that part of the old terminus lying between the high level of the South-Eastern and the London and Brighton Railway is utilised as a goods dépôt, appearing a veritable survival of the primitive railway station, the trusses of the roof being entirely of great timbers, without any ironwork, and of queen-post construction. Barring its necessarily dirty condition owing to its use, the general effect of this old roof is not at all amiss. Just a word about the exterior—and it is curious, by the way, to observe how extremely diverse are the several sites and surroundings of these great termini. In this instance the station has a good open space at its front or west end, but is "engaged" on the north and south side, the former being masked by the South-Eastern Station on the higher level, while the south side is encumbered by other buildings. The entrance front is an odd conglomeration, and could not by any means be called a façade, being too irregular. It really has no architectural pretensions whatever. There is no Hotel annexed, the upper part of the building being occupied by offices. The station proper behind consists of the main-line portion, with its segmental circular roof, and, besides, the very large annexes on either side having span roofs at right angles to the central station. There are iron arched, braced, ornamental trusses longitudinally, with spandrels having carving, which rest on handsome columns. The roofs of the annexes run into that of the central station, and the curved mitreing in this case has rather a pleasing effect. Looking above the wall-plate level there is really nothing ornamental in the roof construction, nor any particular novelty in it. But the general proportions of the interior are pleasing, and the station is lofty.

The terminus of the North London Railway, Broad Street, City, has a heavy looking though somewhat imposing front, of no striking architectural pretensions. But the lower part is so obscured by the covered way for vehicles and by the several staircases up to the station on the high level, that one's attention is taken off the upper part. The best feature in the exterior is really the rather pretty open staircase with small semicircular arches carried on columns, gradated up to the top, on the east side. The treatment of the blank side wall adjoining the Great

Eastern Station is also good, the only perforations being to the tympana of the panelled arcade. As to the interior of this station there is very little to say, for it is of the ordinary simple type, consisting of two span roofs side by side, like other London stations, except on the south end, where it is roofed north to south.

The Ludgate Hill Station of the London, Chatham and Dover Railway has a rather imposing façade in a kind of Romanesque style towards Bridge Street, Blackfriars, and to an outsider certainly gives an impression of a much more important building than it really is. Perhaps it would be unjust to call it a sham front, but it certainly gives the impression of a ground-floor and first-floor, the upper part having windows, and in other ways appearing as if there were rooms or offices. Though the writer knows London well and has lived there since this station was built and often seen its exterior, it was only a short time since he went inside and discovered the illusion. The front towards Bridge Street is practically a screen wall masking the very ordinary wood tie-beam roofs behind. Beyond this there is no fault to find in this honest composition of stock and red bricks and terra-cotta, with its parti-coloured bands at intervals, its boldly projecting twin chimney-shafts and its massive turrets. Terra-cotta in this case was used during the infancy of the revival of this anciently-known material, but the little stamped patterns on some parts of it are by no means effective. There is also in this station that old Italian Gothic conceit, affected too by no less an authority than the late George Edmund Street at one period of his life, of an arch with a semi-circular intrados and a pointed extrados, or, to put it in simpler words, the deeper voussoirs at the crown diminishing down to the springing thereof, a construction at one time erroneously supposed to confer strength—an exploded idea now. Entering the station on the ground-floor booking-office level and going up the steps to the platforms, the discovery is made how the windows are mere openings in the side walls of an open place, and that there are no rooms whatever—it is very like a goods station. However, possibly, when the dividends of the London, Chatham and Dover Railway are higher, all this will be improved. Externally, owing to the station facing a great thoroughfare and being well set back with a good yard in front, it possesses a decided advantage over others of equal importance but less happily situated.

The Holborn Viaduct Station, being a terminus, would naturally be considered more important than the last-mentioned "wayside" station, but in reality seems scarcely so. The space assigned for vehicles is very limited, and as regards the roofing generally it is of the stereotyped order. The architect in this case, taking the buildings as a whole, certainly scores an advantage over the engineer, for by far the best part of the whole affair is the Hotel, which, owing to its situation, more completely masks the railway station than in other cases. The writer has previously refrained from commenting on this kind of Hotel, but in the present example the quiet refined type of Renaissance, though without any very striking features, is most refreshing to observe as compared with the vulgarity of many such buildings. But this was to be expected when the influence of Mr. FLORENCE, one of the firm of the architects to this and the Hôtel Victoria, Northumberland Avenue, had been bestowed on the composition.

(To be concluded.)

ROOD LOFTS IN CHURCHES.

IN the Consistory Court of Norwich, before Mr. Blofeld, the chancellor, an application was made in October by direction of the bishop of the diocese, on behalf of the vicar and churchwardens of St. John, Timberhill, for a confirmatory faculty for a chancel screen with rood loft and gates, and also for a rood beam, upon which were placed the figure of our Lord upon the Cross, and figures of the two Marys, St. John and the Roman Centurion, some of which had been erected so far back as 1895 and other parts during the period when the see of Norwich was vacant. There was no opposition on behalf of the parishioners, the bishop, or any one in the diocese, but as it was the first case of the kind in the diocese it was argued at length before the Chancellor in the Beauchamp Chapel on October 12, when the Chancellor reserved judgment.

The point raised in argument was that neither a crucifix nor images were *per se* unlawful, but only if they were liable by their position or surroundings to foster superstitious worship or devotion. The decisions of the Privy Council in the Exeter case, *Philpotts v. Boyd*, and the Denbigh *eredos* case before Lord Penzance were relied upon, and the learned judge's decision in *Bradford v. Fry*, as adopted by the Privy Council, was mentioned. The Chancellor asked, as a matter of fact, whether all rood lofts had not been removed in Edward VI.'s or Elizabeth's reign. Sir Walter Phillimore admitted their destruction and that of all images, superstitious or otherwise, but pointed out that the only images preserved were those of local worthies for whom no saintly character was claimed. A rood loft or rood beam was not unlawful, and so long as the figures thereon were the representation of an historic scene in Holy Scripture they were covered by the decision of the Privy Council in *Philpotts v. Boyd*, and the *dicta* of Lord Justice Lindley on crucifixes and crosses in the St. Paul's *eredos* case and the decision of Lord Halsbury in the House of Lords. As to chancel gates, the whole question was one of discretion. They were not removed from St. Paul's, Knightsbridge, in *Westerton v. Liddell*, and Dr. Tristram had summed up the law and the practice in a recent reported decision. Gates were needed where churches were left open, as this one was, all day for purposes of private devotion. The Chancellor gave judgment on Saturday last. A faculty to confirm the erection of the rood loft and of the figures at present on the rood beam, and to authorise the placing of the other figures there, was refused; and a faculty to confirm the erection of the screen without the rood loft, and to authorise the placing of gates in the existing screen, the erection of the proposed side screens with gates in them, and the erection of the choir stalls and screen behind them, was granted. Notice of appeal was given.

ARCHÆOLOGY IN HONDURAS.

THE following particulars of a remarkable archæological discovery at Santa Rita have been furnished by Dr. Gunn:—

A rough stone wall was first discovered and on excavating by the side of this a projecting cornice came to light. Beneath this cornice was a frieze of painted stucco, consisting of figures in red, blue and yellow on a blue blackground and outlined in black. To the right was a figure of the Toltec god Quetzalcoatl; next the figure of a warrior holding in his upraised right hand a crucial instrument, opposed to a similar instrument in the hand of another warrior; and to the extreme left a mass of complicated hieroglyphics. The whole of this work of art was unfortunately destroyed by some mischievous persons in my absence. On excavating further, another wall came to light, at right angles to and connected with the first. This also was covered with figures, four of which have at present been brought to light. The whole work is most artistically executed, both in colouring and design, and is undoubtedly of Toltec origin, from the close resemblance of the figures to those of Palenque, Uxmal and other Toltec cities, both in attitude, execution and the style of dress, viz. jewelled and plumed head-dress. Beneath the first layer of stucco are two other separate layers, each bearing traces of colour; and as we know the Toltecs renewed the stucco on their temples at the end of each "lesca age" of fifty-two years, the temple must have been standing for from 104 to 156 years before it was covered by the mound. As to the time it has been buried, it is almost impossible to fix it at all accurately. This is, I believe, the only case in which a Toltec work of art has been brought to light in a similar state of preservation, as those of Palenque, Mitla and other cities present merely traces of colour, as from long exposure to the weather the brightness of the colouring fades, the plaster crumbles; and, unless some means are taken to preserve it, this unique monument of a vanished race will soon be, with its constructors, a thing of the past.

TESSERÆ.

The Symbolism of Gothic.

IT has been said that the Gothic cathedral borrowed much from the arts which preceded its birth. This is true; it is a reproach which it accepts as one glory the more. As theology moulded the ancient philosophies and human sciences to aid in the erection of this its divine monument, so Christian architecture borrowed from the ancient world all its various elements, to transfigure them and penetrate them with a new life. The Indian temple, symbol of the secret working of nature, there divests itself of its shapeless pantheism and appears displayed in all the magnificence of its complete development; the Egyptian tomb there clothes itself in the

mysterious splendours of immortality; the Grecian column breaks the stiff, unbending straightness of its pediments, to mount more freely up to heaven; the Roman arch springs on high more boldly upon the curves of the aspiring ogive; with no less power does Christian architecture assimilate to itself the Byzantine dome and the exuberance of Arabian creations. Of so many differing forms it frames one only form, the innumerable parts of which embrace, invoke and mutually produce each other, blending together in the unity of one living body. Behold the wondrous product of the Christian mind. This it is that breathes in every part and remounts to heaven, its primal source; it draws with it heavenward all the coarsest elements—yea, creation's self. The arches climb aloft on their aerial way, and higher still, and from all points at once the spires shoot upward into boundless space, as symbolising in their flight the sublime extravagance of ecstasy; it is the aspiration, incessant and eternal, of creation towards the Creator.

Westminster Hall.

The roof of Westminster Hall was put up between 1395 and 1399, time of Richard II. It is reported that about the year 1560 and for a century before the English had exported vast quantities of oak from Ireland, and it would appear that Irish oak was appreciated at a still earlier epoch, for "A record in St. Michan's Church, Dublin, which is verified by 'Hammer's Chronicle,' in the library of Trinity College, states that the faire greene or commune, now called Ostomontowne Green (now Oxmorton), was all wood, and hee that diggeth at this day to any depth shall finde the ground full of great rootes. From thence, anno 1098, King William Rufus, by license of Murchard, had that frame which made up the roofes of Westminster Hall, where no English spider webbeth or breedeth to this day." Of course the extract does not allude to the present roof of the Hall, but in support of the probability of its being oak, as now generally asserted, and not chestnut, "Tradition," says Hayes, "gives the Shillela oak (a district in the county Wicklow) the honour of roofing Westminster Hall and other buildings of that age; the timbers which support the leads of the magnificent chapel of King's College, Cambridge, as also the roof of Henry VII.'s Chapel in Westminster Abbey, are said to be of oak brought from these woods, and I think it by no means improbable that the superior density and closeness of grain which is the character of the Irish oak, particularly in high situations and a dry soil, as may appear by comparing its specific gravity with that of other oak, added to the inattention of the Irish at that time to the article of bark, which permitted their oak to be felled in winter, when free from sap, might have induced the English architects to give it the preference in such material works, and it must be allowed that the present unimpaired state of these roofs, after so many centuries, seems very well to warrant this conjecture. It is generally understood that a sale was made of the finest timber of Shillela which remained in Charles II.'s time, into Holland, for the use of the Stadthouse and other buildings, constructed on piles driven close together to the number of several hundred thousand. In 1669 William Earl of Strafford furnished Laurence Wood, of London, with such pipe staves, to a great amount, at 10 $\frac{1}{2}$ per thousand, as are now sold for 50 $\frac{1}{2}$, and are only to be had from America. The year 1692 introduced into Shillela that bane of all our timber, iron forges and furnaces . . . and it is inconceivable what destruction they must have made in the course of twenty years, which was the term of their contract." Another authority for the present roof being of Irish oak is Barclay, who in his "Icon Animorum," published in 1614, and dedicated to Louis XIII. of France, mentions that the timber of Westminster Hall was brought from Ireland. Rees's "Cyclopædia," article "Westminster," contradicts its being of Irish oak, but states it to be of chestnut from Normandy, and Nightingale, in the "Beauties of England and Wales," declares that it is built of chestnut supported by ribs of oak. The Irish oak, however, was employed by Charles V. (who reigned in France as contemporary with our Richard II.) for the roof of the library of the Louvre; and it is so stated by L'Abbé Sallier, in the introduction to the catalogue of the "Bibliothèque du Roi" (of which the Louvre library was the commencement), and this observation has been copied by later writers. Consequently it may be inferred that Irish oak may have been used at Westminster.

Cast-iron Girders.

The first application of cast-iron girders to any extent was in the erection of floors of a fireproof mill constructed by Messrs. Philips & Lee, of Manchester, in 1801. The mills were of very considerable extent, being 142 feet long, 42 feet wide and seven storeys high. The floors were supported by a double row of columns situated 9 feet apart, extending the whole length of the building; resting on these were girders of the parabolic shape by Boulton & Watt, 14 feet long by 13 $\frac{1}{2}$ inches deep, the space between them being spanned by brick arches resting on the bottom flanges of the girders. These

arches were 9 inches deep at the springing, 7 $\frac{1}{2}$ inches for a short distance on each side and half a brick, or 4 $\frac{1}{2}$ inches, at the crown. From 1801 to 1824 very few alterations were introduced either in the section of the girders or in the designs of the floors themselves, and for more than twenty years the mills of Messrs. Philips & Lee were usually taken as a model for structures erected upon similar principles; nevertheless, during the interval just alluded to, the properties of cast-iron were made the subject of many interesting researches by Tredgold, Fairbairn and others, the results of which had considerable influence in increasing the confidence of both engineers and architects in the value of that metal for building purposes. During that period many important improvements were also introduced in the art of casting, and girders of considerable dimensions became of frequent occurrence; among those we may mention the beams used to carry the floors of Buckingham Palace, many of which were from 35 to 36 feet in length. In 1824 Mr. Rastrick recommended to Sir Robert Smirke (then Mr. Robert Smirke) cast-iron girders for supporting the floors of the British Museum, in lieu of the trussed beams previously proposed by that gentleman. These girders, which were subsequently adopted, are 41 feet long, 3 feet 6 inches deep at the centre and cast with an open web. Before being employed they were each tested with a dead weight of from 15 to 20 tons, placed at their centre, and have since proved to be in all respects successful. It was about this period that Mr. Hodgkinson commenced his interesting experiments, among other results of which was the determining of the section combining the greatest strength with a minimum amount of metal. With a view of economising metal by employing beams of equal strength throughout, it is usual to reduce gradually their sectional area from the centre to the extremities; thus in girders employed for carrying floors the strain being in most cases equally distributed, the depth ought to vary in proportion to the ordinates of an ellipse, all the other dimensions remaining constant, and when it is advisable to preserve an equal depth throughout, the same effect can be obtained by increasing the breadth of the flanges in proportion to the ordinates of arcs of parabolas; this latter method has the advantage of economising more metal and also of obtaining greater rigidity. When the sections of the beam at various points are similar, the depth of the beam and the breadth of the flanges are determined by curves of the cubical parabolic form. Theoretically, the variable dimensions would disappear altogether at the extremities of the girder, but in practice it is necessary to provide against the direct shearing strain and also to obtain a firm bedding on the supports; this can be done only by modifying the shape of the girder.

Ozias Humphrey, R.A.

Ozias Humphrey was a charming painter of miniatures; his colour is as brilliant as Petitot's and yet marked by the same exquisite tonality, whilst the labour he bestowed on the finish of the surface almost rivals the result obtained in the kiln of the enameller. He belonged to an old family at Honiton, in Devonshire, that county which has contributed so largely to the brethren of the brush. He first studied with Samuel Collins, an indifferent miniaturist and a very worthless fellow. Collins fled from his creditors and young Humphrey returned to Honiton. Determined to make his way, he borrowed a guinea from his mother and set out on his travels, first to Exeter and then to London, where he entered Shipley's drawing school, at that time the centre which attracted all the men who afterwards became famous. Thence he went to Bath, and lodged with Linley, the musician, whose lovely daughter, afterwards Mrs. Sheridan, then in her ninth year, but already possessing the sweetest of voices, cheered his painting hours by singing to him. After remaining at Bath for some time he returned to London, and being a devoted admirer of Reynolds, boldly showed him some of his miniatures. When Reynolds heard that he was from Devonshire and that his mother was a lace-maker, he exclaimed, "Born in my county, and your mother a lace-maker. Why, Vandyke's mother was a maker of lace!" and immediately took the young painter under his protection. He rented lodgings near his patron at 21 King Street, Covent Garden, and soon got into the full tide of work. In 1773, broken-hearted by the refusal of James Payne, the architect, to accept him as the suitor of his daughter, he determined to travel, and visited Rome with Romney. After an absence of four years he returned to England, and soon after he received by post one morning a letter from Dr. Wolcot (better known as Peter Pindar) dated from Truro, asking him as a personal favour to receive into his house "an uncouth, raw-boned, country lad," about fifteen years of age, with whom he had encumbered himself, and (to use the Doctor's own words) who had "run mad with paint." This youth offered his services to Mr. Humphrey to clean his brushes and palettes and to make himself useful in the common concerns of his house without wages, and all for the pleasure of being with a painter of his knowledge and eminence. The raw-boned lad afterwards became the celebrated John Opie, R.A., and lecturer

on painting to the Royal Academy. In 1785 Humphrey went to India and painted the Rajahs and Begums. In 1788 he returned to England and resumed his profession, and in 1790 was chosen a member of the Royal Academy. He died in March 1810. Romney painted a remarkably fine likeness of him, now at Knowle.

The Freemasons and Mediæval Art.

Architects are apt to forget that by the very fact of copying their predecessors of the Middle Ages, they become most unlike them in that particular circumstance which is the life and soul of all material art, the principle on which it is carried on. The present generation endeavours to recover, like a dead language or a lost science, what the men of old exercised as a living, progressive, self-developing thing. We have, indeed, the body, decayed and worn out as it is, but they had the spirit which quickened it. It is a mistake to suppose that that spirit was identical with, or even the necessary result of, the Mediæval faith. The two things are quite distinct in themselves, as is evident from the fact that we retain the latter, while we had utterly lost and are now only recovering the former. Gothic architecture was immediately and essentially suspended by the dissolution of the Freemasons, in whose hands it was vested like a vast monopoly, rather than by the rupture in the unity of the Christian Church which took place in the sixteenth century. Without such an organised system as that wonderful confraternity supplied, no amount of religious feeling or enthusiastic faith could have achieved the great ecclesiastical works of the Middle Ages, because (as at present) it would have been unable, so to speak, to embody itself in any definite, methodical, scientific way. At the present time few men of genius supply a want and, as it were, a vacuum in the department of ecclesiastical art which was unknown and unfelt in the days of the Freemasons. Our bond of unity, so far as it exists in giving the preference to a particular style, is nothing more than a common consent to admire and copy their works. What, indeed, but a kind of rivalry to be foremost in reviving a lost art could now insure anything like an agreement or uniformity in building and decorating churches? Where each one strives to be the best copyist of an existing model it is obvious that at least a very close approximation to uniformity will be the result. But this uniformity is a totally different thing from that which formerly prevailed through the influence of co-operation and the restrictions of actual rule. It is just as different as the voluntary and independent attempts of five or six fellows of colleges to imitate the old monastic life would be from the working of an actual religious community living under the ancient rule. In the one case monasticism is a thing extinct or at least merely traditional, in the other it is a living reality. So it is with modern church building; the selection of a style is arbitrary, and it is only to a general movement and a kind of fashion (induced no doubt by the best feelings of love and reverence for the mighty past) that we owe the improved character and furniture of the churches which we see rising everywhere around us. Of the history, organisation, rules and craft of the ancient Freemasons next to nothing is known. But we cannot contemplate their works without being filled with amazement at the perfection of a system which for many centuries together could cover the face of Europe with buildings wherein every detail was, for the time being, in the strictest unison, a system under which every advancement and improvement of the art was spread simultaneously and adopted unanimously by the working thousands throughout a wide Continent. Not but that Christian architecture had national developments, or rather, perhaps, took national directions according to climate, material and other external circumstances. For instance, the Early English and the contemporaneous continental Geometric-Decorated, our Perpendicular, and the gorgeous Flamboyant of our neighbours are instances of these diverging tendencies, though all are essentially subordinate to one rule and evidently animated by one spirit.

Cologne Cathedral.

The cathedral is too glorious a work for description. Regular in plan, and almost uniform in detail, it does not afford much for the note-book. The impression that it gives is a whole—one of inexpressible grandeur and beauty. In this respect it is like St. Peter's, that the first glance can in no degree appreciate its scale. The proportions are vast, but most accurate and beautiful, so that at first they only satisfy, and it is long before they begin to astonish. It is curious that one feels as if one had very soon seen the cathedral. Unlike St. Mark's at Venice, for example, where every part and detail seems to detain the visitor, Cologne only impresses with one great effect. Even if a long time be consumed in the church, it is not in the examination of a number of interesting points, but in a contemplation of the whole. The mind expands and soars away in this prodigious temple, forgetful of minute particularities. The eye sees rich details, gilded capitals, coloured imagery, gorgeous windows, but rests on none of them. These are rejected as being sub-

servient to the great idea, or rather they are not rejected, for they are too humble and well ordered to be obtrusive. They are just where and what they ought to be—necessary but quite subsidiary parts of the design, and claiming to be no more. It is just as in the solemn performance of the ritual of the altar, where there are many degrees of ministers, each in his duty and order and dress and local position contributing to make up the whole act of sublime worship. It would be wrong if one knee knelt too many, one taper flashed needlessly, one censer swung too prominently. The rapt worshipper sees all and yet sees none. All he sees and feels is, that in the very beauty of holiness the highest service man can offer is being rendered in the divine liturgy. So the unknown designer of Cologne made every art and even substance minister as it were a rational service in its appointed subordination around the material altar for which he, a true poet, made this material shrine. He has fixed and embodied a heavenly vision. He conceived a not unworthy temple for Him whom the heaven of heavens cannot contain, and we see in wood and stone the expression of his sublime thought. His poem presents to us a master-harmony, in which metal and stone and wood, and every art that moulds them, combine to praise and glorify the Lord; and his work exalts the soul to adoration much in the same way as does the sublimity of an Alpine range. A glorious view of what we call external nature can certainly elevate our souls towards heaven. Much more so can Christian art.

Inlay in Italian Gothic.

Much of the peculiarity of Italian Gothic is produced by the introduction of flat surfaces for the display of mosaic or of painting. Their profusion of marbles has led them to cover whole buildings with slabs disposed in panels, or alternate horizontal stripes of various colours, producing to English eyes the most disagreeable effect, while the limited thickness of this coating excludes the depth and richness of the genuine Gothic mouldings. The cathedral of Florence and its campanile are entirely covered with small panels of coloured marbles intermixed with bands of mosaic work, and reminding one of an elaborate Tunbridge work-box. In the interior of the cathedral of Pisa both piers and walls are constructed in alternate horizontal courses of black and white marble; the same fashion is followed in the front of the Genoese churches, and at Verona the courses are in red and white. A practice more destructive of architectural grandeur can scarcely be conceived; yet the Italians are so enamoured of it that in parts of their buildings where it has been omitted the black stripes have actually been supplied with paint upon whitewash.

William Kent.

The architect of the Horse Guards was one of the most versatile of English artists, and on that account he is often less valued than he deserved. If he came into the world in one of the Italian states instead of in Yorkshire, he would have obtained a name as a survival of the Renaissance spirit. He was born in 1684, and his association with the arts began as a coach painter's apprentice. Following a tendency that was natural with him, he taught himself portrait painting, and his first efforts were considered so remarkable that some gentlemen raised a contribution for the purpose of enabling him to go and study in Italy. Thither he accordingly proceeded in 1710, and remained there several years, till he had the good fortune to become acquainted with the Earl of Burlington in 1716. The noble patron not only brought home his *protégé*, and exerted all his influence and authority in matters of taste to recommend him to others, but took him under his own roof, where he remained till his death, April 12, 1748. How far Kent assisted his patron in his designs, or the latter assisted him, is doubtful; but it is certain that he soon discovered greater capacity for architecture than he had done for painting; and if it be true that the designs for Holkham, the seat of the Earl of Leicester, in Norfolk, emanated principally, if not entirely, from him, that single edifice alone proves him to have possessed very superior talent and taste as an architect, it being a *chef-d'œuvre* in plan, and possessing many graces and beauties of design. As architect and landscape-gardener he was in his proper sphere, and followed both pursuits with the true spirit of an artist. In landscape-gardening, in fact, he forms an epoch, and may justly be considered as the father of the English style of gardening; for, as Walpole, who has not been niggard of praise towards him, observes, he was "painter enough to taste the charms of landscape, bold and opinionative enough to dare and to dictate, and born with a genius to strike out a great system from the twilight of imperfect essays." Shakespeare's monument in Westminster Abbey will preserve his name as a sculptor, without at all adding to his reputation. It is therefore fortunate for it that it will bear such retrenchment without injury to its vital part. There is little doubt that in producing the statue Kent was largely assisted by Scheemakers.

NOTES AND COMMENTS.

BRICKMAKING is an indispensable trade, but there are some places where it seems to create more annoyance for people living in the neighbourhood of the works than elsewhere. A few years ago headaches and other signs of illness prevailed among members of the House of Commons, and the cause was traced to brick-burning at Shepherd's Bush. The metropolitan atmosphere is of such a compound nature, it is not unlikely that the fumes from the brickfields may produce effects which would be imperceptible in another district. The materials used for breeze in London are also of a kind to produce foul smells. The Public Health Act of 1891, if strictly enforced, will however make it difficult to carry on brickmaking within the metropolitan area. A decision which was given on Saturday in the West London Police Court is almost prohibitive of the trade. The Vestry had taken proceedings against three firms of brickmakers at Shepherd's Bush on the requisition of thirty-four of the inhabitants. It was alleged that the smells from the brickfields produced nausea and even blood-poisoning. Mr. CURTIS BENNETT, the magistrate, gave his decision that he must convict the defendants, as he came to the conclusion that the best practical means had not been employed to prevent the nuisance. Fines of 50*l.* and 25*l.* were inflicted, with 300 guineas costs. It was afterwards agreed that the summonses should be adjourned for a fortnight, for the defendants to consider whether they would give an undertaking not to burn bricks except with clean ashes and breeze. In that case the fines might be remitted. The decision must have an important effect on the building trade of London.

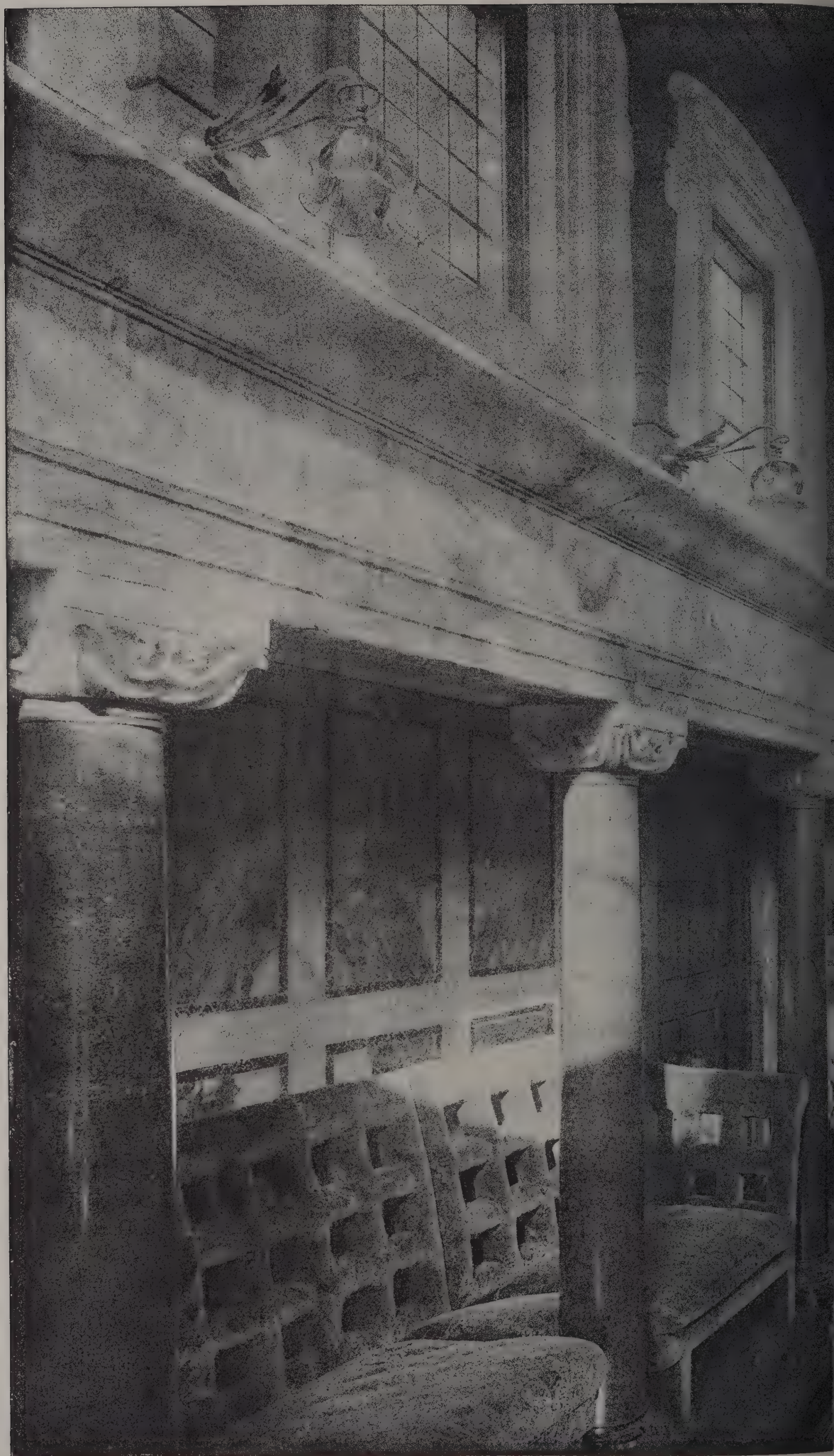
It was only under compulsion that the Royal Scottish Academy agreed to a reform, one of the effects being the election of several architects as associates. Little is gained by attaining full honours or minor honours in the Academy, for its affairs were so mismanaged during many years that identification with it is almost an acknowledgment of old fogeyism. The only use of the Academy is to serve as a survival, in order to demonstrate how many obstacles to the promotion of art can arise from a body of the kind. As long as the Academy possessed a monopoly of the representation of art, people were compelled to endure its defects. The creation of the Society of Scottish Artists enabled people in the North to realise that art could dispense with a fossilised institution. The discovery was gratifying and the new exhibitions became attractive. What was more remarkable, they did not entail a loss which was always inevitable with those of the Academicians. The members of the Academy are annoyed, and they show it in the peevish way which is to be expected with senile hearts. They propose to apply for an amended charter which will enable them "to make rules providing that any member of the Academy who, after the date of this supplementary charter, shall become a member of or exhibit with any other society of artists established in Edinburgh shall forfeit his membership of the Academy, and all the rights and privileges pertaining thereto, provided always that such rules shall not apply to members of the Academy elected prior to the date of this supplementary charter." Privilege is so often abused in the North it is not unlikely that some influential admirers of feudal and other ancient ways may prevail in obtaining a supplementary charter. But there is too much good sense among the people to allow of the approval of so unworthy a way of dealing with rivals. Meanwhile, can the members lately created, who are supposed to represent new ideas, allow themselves to be made the instruments of oppression without a remonstrance?

SOME commotion has been excited in the artistic circles of Berlin by the action of the Emperor in dealing with the prize list of the Artists' Society. This year the Council considered they were justified to put forward in connection with the exhibition the name of Herr PAUL WALLOT, the architect of the new Reichstagsgebäude or Parliament-house, for the large gold medal. In that way the services of an artist who had designed a most important work and spent ten years in carrying it out would be recognised, while painters and sculptors would be doing honour to an

art that is too generally ignored when medals are to be given away. The Emperor did not approve of the selection. Herr WALLOT's name was struck out and for it was substituted that of Frau VILMA PARLAGHY, the portraitist. The interference with the action of the Council was not approved, and endeavour has been made to excuse it on the ground that the architect was not the possessor of a small gold medal, and therefore was ineligible to receive the larger medal. There is no doubt, however, that Herr WALLOT has had to pay the usual penalty of all architects who are entrusted with important public buildings. Every member of the German legislature expected that his special requirements would have been attended to, and when it was found that Herr WALLOT was impartial there was grumbling. The Emperor was not sparing in his criticism of the new building, and he has now shown that he is not forgetful of shortcomings which he has discovered.

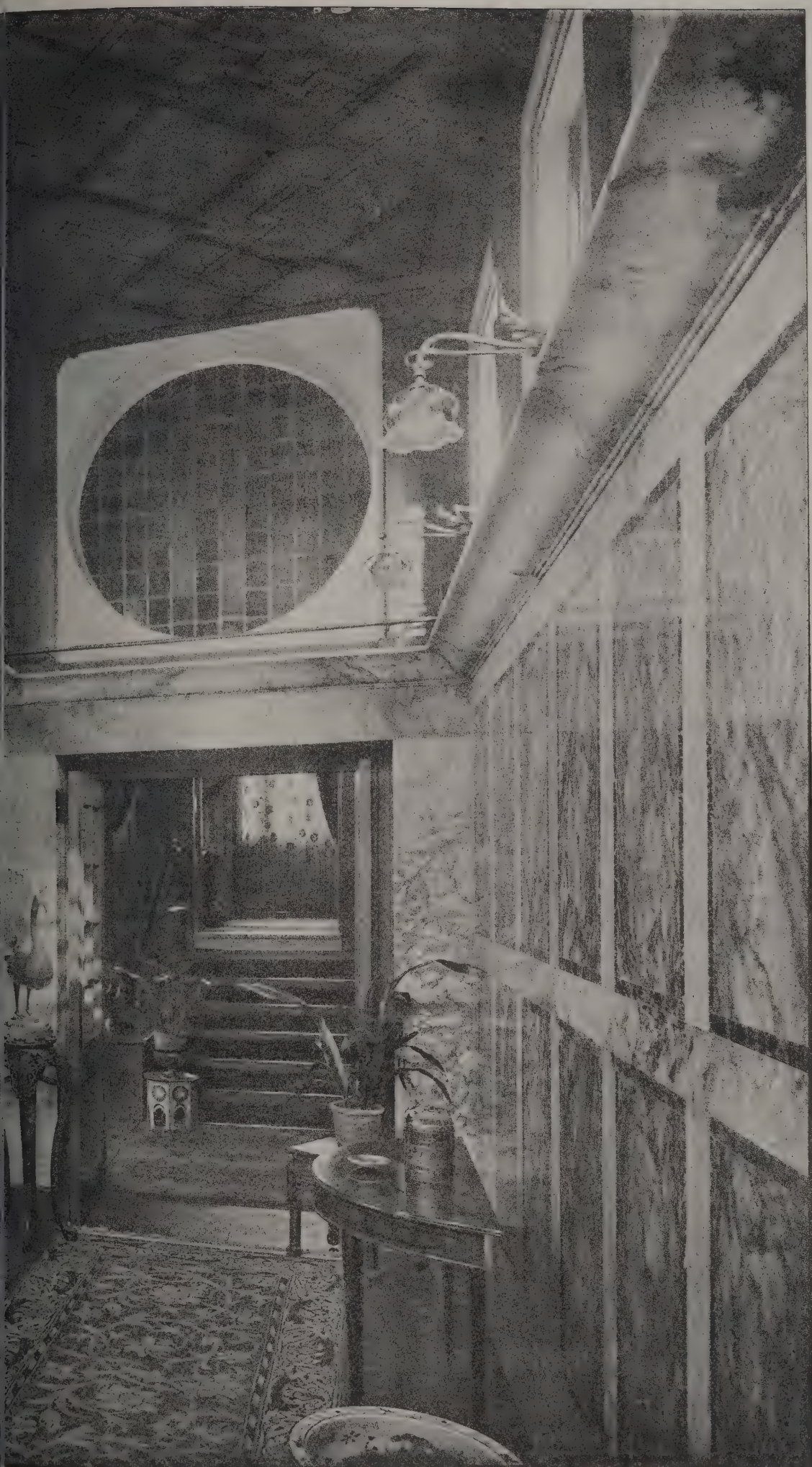
THE traffic in the streets of the Metropolis is so immense and growing, it is no wonder there is a difficulty in regulating the course of vehicles and foot passengers. The death of a physician in Cavendish Square, through collision with a cab with rubber tyres, has of course made doctors and surgeons more anxious about the dangers of the streets. Mr. BALMANNO SQUIRE maintains that the only remedy is a bridge over the roadway at places where this precaution is specially needed, and at other places a more general establishment of mid-road refuges. As to the bridges, he says, "It would be quite impossible that they should be mounted from the pavement. There is not sufficient space in any part of London for that purpose. The only way would be for the County Council to acquire a house on each side of the way and to utilise a comparatively narrow part of each of such houses for the construction of a staircase up as high as the level of the bridge, which need not be at a very high level. The bridge should be thrown from house to house over the roadway and over the two 'side-walks' or 'pavements,' and should have one pier in the centre of the roadway, or, if constructed on the 'girder' principle, need have no pier at all. A large portion of the population are slightly deaf; another large number wear spectacles or pince-nez, and a very considerable proportion are lacking in agility and coolness. Bicycles, hansoms with noiseless tyres, omnibuses, vans, light carts and 'four-wheelers,' all moving at very different rates of speed, have to be dodged, and a selection of the unfittest by a perfectly natural process is the inevitable result." Street bridges would have a most injurious effect upon the architecture; but, apart from that, we doubt whether people would care to make use of them. The Holborn Viaduct is an example. The staircases are an undoubted convenience, but they are not utilised to the extent that would be supposed, and the people who occasionally pass up and down are not of the nervous class.

WE hope the days of adulterated cement are numbered. A meeting of the cement manufacturers was held at the Cannon Street Hotel on Monday last, the 12th inst., when an anti-adulteration Association was formed. By one of the rules it was made a *sine qua non* that a statutory declaration on oath by the managing partner and resident manager of every firm desirous of joining the Association should be sent in. The form of declaration, which was signed at once by Messrs. KNIGHT, BEVAN & STURGE, the Wouldham Company, Messrs. F. C. BARRON & Co., and the Tower Portland Cement Company, Limited, is to the effect that the firm or company have not on any occasion during the last three years, or at any other time, brought to and added to the calcined product of the kiln, in passing through the crushers or mill-stones or grinding machinery or any other subsequent process, a separate supply of raw Kentish rag stone, other stone, furnace or oven ashes, disused or exhausted fire-bricks, or any other material, so that such added material would be ground, sifted or mixed together with the cement and form part of the cement powder, and sent out and sold the cement in this state. It became evident from what passed at the meeting that adulteration on a much larger scale than is supposed is practised at many factories, and one of the most important industries accordingly is seriously affected.



PHOTOGRAPHED BY BEDFORD LEMERE & CO

THE MARBLE ROOM: NO. 1
THE RESIDENCE
PHILADELPHIA



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PARK ROAD, KENSINGTON.
 PRINSEP, R.A.
 ect.

The Architect, Nov. 16th 1894.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

INK-PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

BRICK VAULTING: READING GRAMMAR SCHOOL.
A. WATERHOUSE, R.A., Architect.



PHOTOGRAPHED BY BEDFORD, LEMERE & CO



INK-PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

ILLUSTRATIONS.

BRICK VAULTING, READING GRAMMAR SCHOOL.

THE MARBLE ROOM, NO. 1 HOLLAND PARK ROAD, KENSINGTON.

PARLIAMENT HOUSE, EDINBURGH.

THE great hall shown in the illustration bore some analogy to Westminster Hall before the latter was compelled to be closely guarded to escape destruction. In a country where, as DANDIE DINMONT said, "a man's aye the better thought o' for having been before the Feifteen," the hall became one of the most prized places of assembly. Formerly, according to Sir WALTER SCOTT, it was "divided into two unequal portions by a partition, the inner side of which was consecrated to the use of the courts of justice and the gentlemen of the law, while the outer division was occupied by the stalls of stationers, toymen and the like, as in a modern bazaar."

In his "Memorials of Edinburgh in the Olden Time," Sir DANIEL WILSON gives the following information about the history of the hall:—

The Great Hall measures 122 feet long by 49 broad, and although the windows have been altered, its curious open-timbered oak roof remains, springing from a series of grotesquely sculptured corbels. Long after it had been forsaken by the Scottish Estates it retained the high throne at its southern end, where the sovereign or his commissioner was wont to preside over their deliberations, and on either side a range of benches for the nobles and barons, with lower ones in the centre for the commissioner of burghs, the Scottish Estates having formed to the last only one deliberative assembly. Without this area a pulpit was erected for sermons to the Parliament, the same, we believe, that is now preserved in the Museum of the Society of Antiquaries under the name of "John Knox's pulpit." Along the walls there hung a series of portraits of sovereigns and eminent statesmen, some of them the work of Sir Godfrey Kneller, but these were among the first of its decorations that disappeared, having, it is said, been bestowed by Queen Anne on her secretary, the Earl of Mar. Others, however, of those paintings adorned the walls within the recollection of our older citizens and are now, we believe, at Holyrood House. Portions also of early decorations, including fragments of ancient tapestry, the hangings in all probability that were put up during the Protectorate, were only removed towards the close of last century. Nicoll tells us, "The Preses and the remanent members of the great counsall did caus alter much o' the Parliament Hous, and did caus hing the Over hous with riche hingeris in September 1655, and removit these rounes thairintill appoyntit for passing of the billis and signeting of letters. So wes also the Lower Hous diligitlie hung." Nor should we omit to mention The Creed and Ten Commandments, once so appropriately suspended on the walls and mentioned in a MS. volume of last century as "taken down when the Court was repaired." Those decorations have been replaced by statues of Duncan Forbes of Culloden, Lord President Blair, son of the poet Lord Melville, Lord Chief Baron Dundas, Lord Jeffrey and Lord Cockburn. But superior as those sculptured marbles undoubtedly are as works of art to the paintings and tapestry they replaced, the cold beauty of the marble—even though wrought by the chisels of Roubiliac, Chantrey, Brodie and Steell—very imperfectly supplied the place of the luscious colouring of Kneller, or even the faded antique needlework which helped to harmonise the walls with the grotesque yet rich effect of the old oak roof. But happily since then the portraits of royalty have been not inaptly replaced by those eminent judges and members of the Bar.

To a stranger visiting the Scottish capital few of its public buildings are calculated to excite a more lively interest than the scene of its latest legislative assemblies, for while this shares with the deserted palace and the degraded mansions of the Old Town many grand and stirring associations, it still forms the hall of the College of Justice founded by James V., at once the arena of the leading Scottish nobles and statesmen of the last two centuries, and the scene of action of many of the most eminent men of a later day. Beneath the old roof thus consecrated by historic memories the first great movements of the Civil War took place, and the successive steps in that eventful crisis were debated with a zeal commensurate with the important results involved, and with no less fiery ardour than that which characterised the bloody struggles they heralded. Here Montrose united with Rothes, Lindsay, Loudon and others of the covenanting leaders in maturing the bold measures that formed the basis of our national liberties, and within the same hall only a few years later he sat with the calmness of despair to receive from the lips of his old compatriot, Loudon, the barbarous sentence which was executed with such savage rigour.

Mr. E. Macbeth, A.R.A., has been elected a corresponding member in the section of engraving of the French Academy of Fine Arts, in succession to M. Dangarin. M. Pradilla, of Madrid, has succeeded M. F. Madrazzo as foreign Associate.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary meeting of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

Mr. F. GOLDSMITH, hon. secretary, read the following report of the general committee on the resolution of January 19, 1894, on the education of workmen, which was duly adopted:—The Association on January 19 last referred it to its committee to inquire and report if, and in what manner, the Architectural Association can usefully exert its influence towards the organisation of a more thorough system of education than at present exists for artisans engaged in the London building trades, and its further supervision by architects.

We have carefully considered this reference and have caused numerous inquiries to be made. We are satisfied that there are many questions connected with the education of artisans in the London building trades which are of very considerable importance to the future well-being of architecture and which are needing careful examination. The best course seems to us to be for the Association to invite a conference to meet at an early date to discuss these questions. We have consulted the following bodies, and have been informed that they will gladly appoint representatives to attend the conference:—Architects—The Royal Institute of British Architects, the Architectural Association, the Art-Workers' Guild, Independent London Architects. Master builders—The Institute of Builders, the Master Builders' Association. Workmen—The Building Trades Federation, the Operative Bricklayers' Society, the Amalgamated Society of Carpenters and Joiners, the National Association of Operative Plasterers, the United Operative Plumbers' Association, the Operative Stonemasons' Society. City companies—The Carpenters' Company, the Plumbers' Company, the Bricklayers' Company. Educational bodies—The Technical Education Board, the London School Board. Polytechnics—City and Guilds' Technical Institute, Regent Street Polytechnic, Battersea Polytechnic, Borough Polytechnic, Goldsmiths' Institute, New Cross, and People's Palace, Mile End. We recommend:—"That we be authorised to invite a conference of representative bodies to meet at an early date to discuss the education of artisans engaged in the London building trades, and to take such other steps as we consider desirable in the matter."

E. W. MOUNTFORD,
President, Architectural Association.
F. T. GOLDSMITH, } Hon. Secs.
B. F. FLETCHER, }

The Study of Modern Architecture.

Mr. PITE said:—It is not much good mourning over the times we live in—that we have to deal for the most part with unartistic and parsimonious clients, that we have no native art traditions or instincts to assist us in the craftsmen whom we employ, that where architectural ability exists it is no recommendation or guarantee of professional success to its possessor, and that commissions are obtained by much the same connections as more ordinary business, the family friends or social qualities of the young architect being more certain sources of prosperity than ability or even genius in his art, or that competitions are generally an effective premium upon subservience to vulgar (not using the word offensively) ideals. We, indeed, as architects reading the glorious past of empires and nations in their architecture might well weep aloud for the blindness and ignorance of the rest of our race were public weeping of any avail.

And as young architects, having much of the frank discrimination of childhood still left to us, might we not lament that many, very many, perhaps the great majority of our professional elder and younger brethren, are sadly deficient in true architectural perception or power, and that the sum of all our labours is a national architecture which, in comparison only with contemporaneous work abroad, is quite unworthy of our idea of Great Britain's international position? And leaving out our elders from the purview, can we be at all happy about ourselves; is the "Architectural" element of our present "Association" worthy of its name? Does not the suggestion of a critical review of the aggregate architecture evolved by its members chill us with searchings of conscience that our self-satisfaction would be unable to survive? But all this mourning and pessimism is not very much to our present purpose. Let us at the outset assume all that it can do for us by accepting the conviction that there is much scope for improving by what means we can our modern architecture, and taking the common "A. A. man" as we find him, and the ordinary circumstances of present-day practice, let us consider what the study of latter-day architecture can do for our present discontent.

Mr. Fergusson comes to this conclusion in his "History of Modern Architecture," without unhappily helping us forward.

"On reviewing the history of architecture during the past three or four centuries, the retrospect, it must be confessed, is sufficiently melancholy and discouraging. For the first time in history the most civilised nations of the world have agreed to forsake the only path that could lead to progress or perfection in the 'master art,' and have been wandering after shadows that constantly elude their grasp. When we consider the extent to which building operations have been carried during that period, the amount of wealth lavished on architectural decoration, and the amount of skill and knowledge available for its direction, it is very sad to think that all should have been comparatively wasted in consequence of the system upon which these have been employed. Few will dispute the assertion that there is no Renaissance example equal as a work of art to any Gothic or Saracenic building, or that ever attained to the picturesque appropriateness of these styles. Nor has any modern design ever reached the intellectual elegance of the Greek or Roman, or the sublimity of the Egyptian; and all this simply because of the mistaken idea that success could be achieved without thought, and that the past could be reproduced in the present."

But Mr. Eastlake is more hopeful, and cheerily points out a road to an architectural paradise which, unhappily, but a few short years have sufficed to make us forget. The conclusion of his "History of the Gothic Revival" is as follows:—"Architects must learn to sacrifice something of their antiquarian tendencies; the public must learn to sacrifice something of their conventional taste. By dint of earnest study and endless experiments, by help of theory and precept, by means of comparison and criticism, the grammar of an ancient art has been mastered. Shall we ever be able to pronounce its language—not in the measured accents of a scholastic exercise, but fluently and familiarly as our mother tongue? Will a time ever arrive when, freed from the idle prejudices, the pedantry, the false sentiment and the vulgarisms which have hampered its utterance and confounded its phraseology, this noble and expressive language shall be used throughout the land, retaining here and there provincial idioms—rising to eloquence in our towns and majestic emphasis in our public buildings, telling of rural beauty in the village homestead and exciting to devotion in every church, proclaiming comfort in every home and stability in every warehouse? Then, and not till then, shall we possess—if it be worth possessing—a really national architecture. Then, and not till then, will the Gothic revival be complete."

The study of architecture hitherto has consisted of the review of the works of antiquity, all the resources of which have been laid under contribution to our knowledge of what we have mistakenly called the "styles." Travel and research during the past hundred years have made this possible, and, attracted in the first place by beauty of form and detail, then by the interest of history and developments, architectural students have glowed with enthusiasm over Greek, Egyptian, Roman and almost every "style" as it became available for observation. A somewhat wider range of view more recently has led to a consideration of the methods and motives of ancient design and construction, and enthusiasm has grown into wonder as the science displayed by Greeks or Goths has been discovered where little else than native genius was suspected to have been at work. The æsthetic and accidental charms of all the "styles" have not been wasted upon desert air, as sketch-books and photographs have noted and secured their effects for further publication or use. None of this enthusiastic study has really been wasted; its fuel has obtained for us a warmth and touch of imaginative colour that has been invaluable to all our conceptions of the past in art and literature, and has been especially manifest in the work of the historians, with which our own generation has been so richly endowed; but as the architectural student in becoming a practising architect has been overmastered by his love of the forms and principles of "the antiquary times," the result upon our current modern architecture has been the occasion and cause of our melancholy and discontent.

It will be a hopeless and thankless task to set before architectural students the foolishness of this enthusiasm, and the unwisdom of a thorough concentration of energy upon the mastery of the secrets of the success of ancient work. Without this kindling of interest and awakening to the artistic life of architecture we shall be worse than mere pedants, and be mere measurers of buildings, construction tailors, drudges of mechanics and soulless men of business. Enthusiasm and a lofty ideal of beauty are all and everything to true architectural success, and at all costs the flame must be kept burning, and speaking to students the pre-eminent need of a devouring zeal for their art must be insisted upon. If you have not yet experienced the unmistakable joy of discovering a deep pleasure and delight in the attainment of an architectural design, a pleasure that lights up all the study that otherwise might appear dry and uninteresting, that creates a living interest in fine buildings leading cheerfully to laborious measurement and study, and to be very practical indeed, if all your spare time is not claimed after other pre-eminent

duties and calls to its pursuit—an old-fashioned but well-chosen word—by almost irresistible impulse, you may well have serious misgivings as to your future in a profession which is full of most anxious responsibilities, which has an unusual proportion of disappointments and difficulties, and which is by no means remunerated in proportion to the care and study required to attain success in each single exercise of the architect's duties. It is a matter of deep conviction that a young architect's path, except in very rare and fortuitous instances, is one that above all requires the stimulation of a genuine and spontaneous enthusiasm for his art.

Our position is therefore, that the marvellous enthusiasm for varied phases of the architecture of antiquity to which this century has been witness cannot be any longer beneficial to the modern architect, and further, that without some equally potent force as living and instinct as the ardour of the past, the modern architect, and with him modern architecture, is in a pitiable condition.

We are not altogether without sources of information as to effect upon architectural art of different conditions than those which have operated upon ourselves. In spite of our native phlegmatic tendencies our more volatile continental neighbours have been no competitors with us in the race for novel fashions and styles. The mysterious rabies of our Gothic enthusiasts has scarcely infected the warmer blood of the French and other nations of southern Europe, and we can discover in their architecture little or none of the frenzy of our own.

In company with Belgium, Austria, Italy and Germany, France has pursued a regular academical development of the traditional architecture of the immediate past, and with patient studiosness the "European style" of the nineteenth century has been developed. No warmth of feeling has evolved in its generation, and while claiming respect for all the qualities of appropriate and characteristic civility, we fear that until the loving and progressing hands of Time with her handmaid History intervene, no warmth of enthusiasm can be excited within us towards the continental architecture of our own times.

We cannot stay to discuss fully now the causes of the want of freedom and adaptability, the liberty and fraternity of design that seem the inevitable result of the academical system of complete architectural training as adopted abroad. It must be sufficient to say that mere enthusiasm for training or study and education cannot of itself supply the needed fire, and that we must not mistake professional equipment and qualification for architectural efficiency and power. There is some considerable danger of this at present among ourselves, as we are all conscious of the slackening interest in old work and its study, as the failure of competitions for medals and prizes offered for measured drawings testifies, and it is to be feared that the progressing pressure of examinations is already impinging upon the tender growth of that enthusiasm which architectural educators seem strangely incapable of assisting. Until we get a new enthusiasm, let us take care not to strangle the old one. Enthusiasm may be foolish, but she is a goose that has laid golden architectural eggs.

Our position, however, will soon become ridiculous. We are waiting for an afflatus—for some now unknown, but ardently-desired guide—some cherub or "mahatma" to hoax us into vigour and reveal the new laws of the unseen beautiful of Goethe. Where is the romancer to conjure us, as Walter Scott did our grandfathers, into the Gothic revival and the Houses of Parliament into existence; or the philosopher who, as Ruskin, can make us, like our fathers, weep with joy over the stones of Venice and conjure the Oxford Museum and the Law Courts into being; or an architect even like the cunning charmer who has led all his followers into the softly-fatal toils of that Circe of architecture Queen Anne, and has left them there transmogrified into lower beings? The strings of our artistic being wait for some Æolian breeze from Parnassus to awake fresh chords and harmonies, and, while we wait and sigh, the examination and qualification screw is being applied and the soft impressionable artist is being strung up into an instrument that must be struck artificially and smartly before any sound can be obtained from him—the piano-organ of the streets, in fact, being only an Æolian harp progressively strung up and tuned to qualifying pitch, assisted by applied mechanics in the production of music, so as to be independent of the gentle zephyrs of heaven.

Speculation as to the future is almost as unprofitable as lament over the past, but the suggestiveness of the idea that architectural students two centuries hence will be like ourselves, enthusiasts as to the works of their own ancestors, may have something to teach us. Why not apply our own treatment of the past to our present? Why not be as enthusiastic about the work of the nineteenth as about that of the seventeenth century? Why not sketch it, study it, measure it? It may be every bit as good and much better, as Queen Victoria is than Queen Anne, or even Queen Elizabeth. All that goes for the making of good architecture has been much more

abundant in our era than in the past, and, perhaps, if we gave up looking at distant objects with telescopes and looked naturally at what is around us we should find as much to interest and delight our eyes. Surely the historian will feel an enthusiasm for the nineteenth century that will be shared alike by the man of science and the artist and man of letters. Why should the architect stand aside and be unmoved? Is he not already qualified by his recent revival of the whole gamut of the styles from Egyptian down to the Batty Langleys of the eighteenth century, to proceed into the nineteenth and study modern architecture with some of the enthusiasm that he has lavished upon the others at such expense of reputation to himself? There are marvels enough of construction, economical as well as extravagant, of applied science, differing from that of Greek temple or Gothic cathedral, but definitely architectural in the equipment of our buildings and their adaptation either for machinery, public uses, or domestic comfort. And within the limits of a century have we not erected a series of buildings the æsthetic qualities of which are varied and beautiful in a very high degree and more so than those achieved by any other race, the wide world over, in a similar span of years? In construction, in scientific equipment and in æsthetics, surely the architecture of the nineteenth century will be as worthy of enthusiastic admiration, we do not say imitation, as any of its predecessors that now excite our envy. The inbred and underlying general maxim of our education, that ancient work is good and worthy of study and modern bad and unworthy, is illogical and untrue, and without attempting to invert it and prove the opposite we may safely admit modern architecture to the students' course and commend it to his heart, without offering the smallest slight to his ancient ideals, or destroying the value of a single result obtained from his enthusiastic devotion to the past. Study and enjoy ancient art as much as ever will be the best advice to give, but also study modern and enjoy modern architecture, if only for its modernness, and derive your enthusiasm from the wonderfulness of modern life and invention and display your delight in it in your architecture by your frank acceptance of the present, by your heartiest endeavours to make the best use of the materials, inventions and science of the time, and let your trained and instinctive sense of beauty express in proportions, composition, features and decorations that you are not guided by a blind subservience to archaeological ideals, but rejoice in living in an age of privilege and advantage, with all the knowledge of the past ready to your hand and the products of commerce and science at your disposal.

It was the use of advantages and qualities such as these that made all characteristic architecture in the past, and that cannot fail to do the same for us and you, and a little patience and common sense will soon reveal to us, and to the world at large, perhaps to them before to us, that an enthusiasm for modernness in architecture results in more direct and simple beauty than some of us expect.

From day to day, in ordinary practice, we are, of course, face to face with all the essentials of modern architecture, in whatever branch and for whatever purpose we have to design, and putting aside the uncomfortable yoke of archaeological style will be no difficulty in itself—greater freedom for imagination will be the result, and the resources of all beautiful buildings are at our disposal for material as before, and a free hand for their artistic and eclectic use, when we perceive that we can use them to realise our ideal of what architecture should do for our time and age. Nothing can be evolved out of nothing, and we are far from suggesting that the architect should lay all his present materials of design aside and figuratively make bricks without straw. All this material, however, does not lay, as the Royal Institute of British Architects' examination scheme in its art section syllabus seems to imply, in a knowledge of the forms and features of ancient architecture. The beauty of ancient buildings cannot be transferred by imitation to modern ones, for you may measure and photograph and reproduce in actual building, and find that you only have a stupid copy without life or interest.

As this has been a century of revivals, examination of some of its typical buildings cannot but be instructive. Try to discriminate between the beauty that is merely borrowed from antiquity and the living elements of architectural art that compose it. Ascertain how much is interesting and attractive merely because it is reminiscent to the student of bygone art, and how much is beautiful because it is expressive of the architect's delight in his problem and its elucidation, and manifests his appreciation of justice in proportion of ornamentation and form. Analytical study of this kind is essential to a proper grasp of the architecture of any period, though the dry-as-dust pundits of the day are not awake to it. It is indeed a wonderful education in itself to behold a great building as the Parthenon, simple in all its parts and clearly readable in its plain construction, to recognise an awful grace and a fascinating dignity in its picturesque grandeur, and cherishing the fact of its unmistakable beauty seek to ascertain the anatomy of its expression. It is, indeed, not a fruitless task for a modern

architect; the secret of its beauty is not only in the subtle mathematical ratios that underlie its design, not in the forms of its detail and not only in the unrivalled dignity of its Acropolis site. Surely it is not in its antiquity, for it must have been more truly and perfectly beautiful when it was first revealed as a work of the most modern architecture of its glorious era than even now in its picturesque and suggestive but sad ruin.

Its charm is independent of archaeological descent or antique traditions, and lies in a manifested power to support and carry, to shelter and shade, and to endure with firmness. The mind without effort is assured that the first necessities of all building are satisfied. The simplicity of the expression of these great facts is its first claim upon the mind, just as is the sense of the immovable, and, so far as time is concerned, eternal solidity and vastness of the Great Pyramid. But this serene majesty of conscious power is secured and expressed with every evidence of perfect finish and completeness; the same strength of support might have been barbaric and over strong, the sense of shelter might have amounted to gloom, and the sense of firmness and footing might have been inelastic and dead, but everything has been accomplished with art as well as with power; the columns are perfectly shaped for their load, and are decorated to emphasise the direction of their expression; they are shaped to completely satisfy the eye as to stability, and their abaci crown them only to receive their load aright. Their bulk is regulated by the superincumbent load, weighed with regard to the possible length of connecting beam, and adjusted to satisfy the eye as to the due proportion of void and solid. The ample entablature is the essential element of the design, affording shelter and binding with simple horizontal masses and lines the supporting columns into covered and shady colonnades, and in carrying the roof makes it a building. The entablature is emphasised and decorated, as a rest, with sufficient beautiful forms in the metopes, the undecorated triglyphs with their vertical flutings sufficing to convey the expression of the downward bearing of the roof upon the columns. The cella walls are equally expressive of the required enclosure, without unnecessary architecture, yet magnificently decorated with the unbroken line of frieze, still remaining in part in the western walls. In all, the simplest lines and the most direct expression governing the whole, permitting in the decoration the required element of freedom and play of lines to afford balance and contrast to the eye.

Every one of these elements and methods can be transmitted into modern architecture, and all the architectural materials of the design be handled and disposed by the skill and judgment of the architect rather than the mere reiteration of its forms and details. It is, however, indeed singular that you may have a reproduction not only of the forms and details, but of the exact proportions and size of the original, and miss its mysterious and complete beauty. The Walhalla near Ratisbon, built by Klenze as a Bavarian temple of fame, is a complete archaeological effort to reproduce the Parthenon. The building occupies a fine site on the slope of the hills that border the Danube, that would lend itself to any really fine building if suitably designed. No expense has been spared upon it or its sculptures, but apart from the inevitable differences of material and site the whole is uninteresting except as a failure, and miserably unimpressive as architecture. Looking upon the Parthenon, some years later it is true, not a thought or recollection of the vaunted Walhalla crossed my mind, and were it not a fact that the latter is an express reproduction of the other, even as to size, nothing would connect the modern commonplace with its real original in any way. It must be something more than even ignorance of the curvature of the horizontal lines that makes the difference. And Klenze could do very satisfactory modern work himself when less trammelled with archaeology, as witness the new Pinacothèque at Munich, which is a really fine and simple Classic building, admirably adapted for and expressive of its purpose as a picture-gallery and distinctively modern and reasonable.

The application of an analytical examination to a modern building of the revived Greek "style" will be equally valuable to the student. Admit as an archaeologist the interest and charm of reviving pure Greek mouldings, features and proportions; but having admitted so much, carefully strip the modern edifice of all this adventitious unarchitectural quality and see then what of permanent and modern architectural value remains. This does not mean that you are to regard the building as a carcase without the forms and details requisite to its beauty, but as having each of them, on account of their express suitability and appropriateness to the purpose in hand, not merely as necessary adjuncts to the design, because it is pseudo-Greek in style, and are demanded by antiquarian rather than architectural instinct. But this analysis of the archaeological motive in design ought to go deeper still into the principles that regulate a use of features, and should decline to admit the use of the order or pediment decoratively, apart from the interpretation of the natural constructive elements of the building. A concrete case, in such a work as St. Pancras Church in the Euston Road, which we all know, will illustrate

the process and enable us to ascertain how much of it is ancient and how much modern architecture, and how far the ancient principles of design have been preserved in the re-use of its elements.

This particular example is the more interesting as it was erected by Inwood, who, after its completion, designed the neighbouring church of St. Mary's, in Seymour Street, Somers Town, in the Gothic "taste." In the design of the latter church archaeological zeal and accuracy play no part and exercise no charm, as Inwood was in darkness as to the new light that was about to dawn from the lamps of Mediæval art, and having but the barest acquaintance with its forms and details, he had to fall back upon his perception of the ordinary and common properties of all architecture. This work, therefore, unfortunately proved to be lacking in any pleasing quality whatever, its proportions being ugly and the whole thoroughly uninteresting internally and externally, in arrangement and impression, and the greatest charity could only regret its removal or its "restoration," as destroying an instance of the real poverty and barrenness of the field of modern architecture early in the nineteenth century, apart from an enriching fertiliser compounded of the dry bones of defunct ages. St. Pancras is, on the other hand, a building that suggests in every form and detail enthusiastic archaeological study. I well remember being taken to the church, as an unsophisticated child, and wondering why the sides of the windows, instead of being upright, inclined towards each other at the top and widened outwards below, and the somewhat later discovery in a picture-book of Egyptian doorways that did the same, and the appreciation that ensued of the architect's motive, which I may have supposed had been to make a church as much as possible harmonise with the pictures in the Scripture history-books of the period. Another early impression, however, was of the very solemn and awful effect of the row of heathen goddesses that kept watch on either side of the church over the large tea-caddies outside the vestries. Parenthetically, too, of the curious ecclesiastical position of the preacher, standing within a wondrous pulpit, made out of the Royal Oak in which King Charles II. had been ensconced, though not for the purpose of preaching. The antiquarian thoroughness of the design is, in its way, most remarkable, and is, perhaps, of a sounder type than that of Klenze's Walhalla. The prototype or fountain is in the Temple of Minerva Polias, which forms part of the Erechtheum on the Acropolis at Athens, the lovely eastern portico of which supplied the order of St. Pancras—how different the result can scarcely be described. The original seems to be a very offering to the Graces of architecture; a refined and delicate elegance of proportion, a sense of style in its true meaning, of virile beauty and quiet power characterises it, which loses nothing by its position upon the platform of the Parthenon, in mathematical comparison with which it is almost diminutive in scale, though in interest and varied charm holding its own completely. The portico of St. Pancras is just double the size of that of the Temple of Minerva Polias, and though the utmost care has been bestowed upon the detail of the order, the real appreciation of the subtle grace of the original being lacking, its charm has not been grasped. There is (sadly enough for our consciences, if profitably for our present purpose) one of the columns from the eastern portico of the Erechtheum in the British Museum, and even as a limb torn apart from its body it is a wonderfully beautiful object, which each of you should take an opportunity of examining, and one day on your way to the "artists'" shooting-gallery behind St. Pancras Church of comparing its effect with that of one of its overgrown imitations. The portico and order of St. Pancras, however, fails for other reasons than want of charm in proportion. There is no simple and easily-perceived motive prompting its existence or design. The hard and unpleasant truth will out that it is but a sort of antependium to the steeple composition, with which it is connected by an attic which acts as pseudo-peribolus to the octagon temples above, and which disconnects the roof of the church most effectively from the pediment of the portico.

The design of the steeple may roughly be described as two choragic monuments placed upon each other, surmounted by a tower of the winds and crowned by a large acroterium and a Latin cross, with the exception of this last item all the detail being Athenian, though the composition is borrowed from Sir Christopher Wren. Setting aside antiquarian considerations, the interest vanishes, though the subtle conceit of applying a choragic monument for the accommodation and celebration of campanological music and a tower of the winds as the site for a weathercock might be cherished as sufficiently sentimental to be respected, though by the way the appropriateness that might have been gained by affixing the clock face to the horologium or tower of the winds has not been taken advantage of, the clock having been wisely brought lower down the steeple into view.

Apart from being nakedly uninteresting, the proportions of the composition of the western front are satisfactory, and will preserve for the building and its architect more esteem than

the effort to be Greek. The eastern end of the church is necessarily more original and consequently satisfactory, the apse and transept-like vestries having some scale, grouping and expression of their own. The infatuated architect—is the description too strong?—however, with infinite pains and much expense has conceived and executed the wonderful caryatid adjuncts, with cecropian sarcophagi, one supposes for the purpose of typifying that, modern Acts of Parliament to the contrary, the enclosure around the new St. Pancras Church was meant to be a graveyard. All this we admit to be sheer excess of antiquarian zeal, wasted upon architecture and unworthy of the good sense of our time. Not that architectural poetic effort is senseless, but that the reproduction of antiquarian beauties for this purpose is not architecture at all. The wondrous beauty of the single caryatid portico of the Erechtheum, however, can only be travestied and wasted upon London. Its effect and freshness belong to the living and permanent efforts of architecture. The south elevation of the Erechtheum, which looks upon the north side of the Parthenon, presents no other features than these majestic sisters, sculptured in dignified awe of the building they front. With masterly consideration and self-respect the architect presents no peristyle or portico to flank the Parthenon, though every other front of his building is so treated, the strikingly original and unique composition that he designed preserved the dignity of the Erechtheum in according its homage to the Parthenon. Of the figures we do not dare to speak. They are, perhaps, the most striking combination of the finest architecture and supremest sculpture that the world possesses. They cannot be claimed separately by either art; they are at once architecture and sculpture, differing in their essential combination from the partnership of service that each of the sister arts agreed to render in perfecting the Parthenon. Sir Frederic Leighton has paid an eloquent and discriminating tribute to the sculpture of the caryatides in one of his addresses, remarking on the subtle variations of line in the different figures. Five of the six sisters are *in situ*, the sixth is in the British Museum, miserably divorced from domestic happiness in a chilly and unhappy exile, losing instead of gaining by its solitariness. A reproduction cast in cement most ineffectively takes its place on the Acropolis, and as a good cast would be satisfactory enough for purposes of study at home, it does seem desirable that the integrity of the Cecropium of the Erechtheum should be, by an act of our Government, satisfactorily restored by the replacing of the original where it will be of immense value to the wonderful building of which it is an integral part. I am indebted for this suggestion to a conversation with Mr. Arthur Cates, whose friendship with Dr. Schliemann and knowledge of Athens qualify him to speak, and as questions which would arise and difficulties which would lie in the path of the return of the Elgin marbles to the Acropolis would not arise in this case, and as the result must give much gratification to the whole world of art and letters, it is to be hoped that steps may be taken to give effect to the suggested restoration of this exiled caryatid figure.

The present Prime Minister, being a member of the Society of Dilettanti, we can certainly invite the Institute of Architects, with their great Athenian president, to seize their opportunity. The caryatides of St. Pancras are of clay and iron mixed. The interior, however, being less trammelled, is more satisfactory, and indeed its large and spacious effect of a fine hall with an impressive apse is to be preferred as more suitably modern than many Gothic interiors, having dividing arcades and walls with narrow and unscientific ceilings and roofs.

There are lessons enough for an observant student as to the permanent and effective qualities of modern architecture, even after skinning off all that the architect himself would have called the architecture of such a building as St. Pancras Church. What is true of works of the Greek revival is equally so of the Gothic, though the degree of interest may vary, and as the sources lie ready to the hand of the architect, as well to the eye of the world at large, it is more difficult perhaps to separate the elements of design. But the test may be applied in the crudest way to the most recent and perfect examples of modern ecclesiastical architecture. Deprive a modern thorough Perpendicular church of its archaeological robe, and of its studied interest in correctness of style and purity of period, and what is there left to indicate that the world has moved on since its primal age of Mediæval beauty and innocence, and that we are in the age of England's greatest prosperity and glory? What is left indeed to indicate any life or movement, or that it was built in the nineteenth instead of in the fifteenth century, except, perhaps, the existence in the building of a heating apparatus, a gas supply and some limited sanitary arrangements? Consummate archaeological and artistic skill are required to accomplish such a result as against natural tendencies and laws. And in our time such efforts have fairly maintained the unreasonable conflict with modern progress, but to no good effect, for when the disintegrating intellect of time pronounces verdict upon such works, it will be without

recollection of the fiery enthusiasm for Mediæval antiquity that produced and governed them, and they as buildings of modern times will be judged by the light of the nineteenth century.

There are a large number of buildings, however, of the Gothic revival that have qualities well calculated to survive the ebbing of the tide of Mediævalism—buildings the interest and charm of which rest upon surer artistic grounds than are common to all the ages.

We are gradually drifting away with the tide from sympathy with the feeling which prescribed a peculiarly national style, such as Elizabethan or Perpendicular, for the Houses of Parliament, while Pugin's accuracy of feeling for Gothic detail is perhaps somewhat palling upon our jaded and corrupted palates. But there remains in the group of buildings by the riverside at Westminster a beauty that is more lasting than a passing taste, and reveals the fact that the greater architectural qualities of majestic symmetry and grandeur of grouping are permanent and essential to success. A celebrated Munich artist, Mr. Rosenthal, who had rather derided English architects as "Gothic eaters," said to me that of all the buildings he had seen in England this was the most lovely, and he was in little doubt as to its being the most charming group in Europe. The effect from the river or from either Embankment is one of graceful ease and restful picturesqueness, illustrating the overlooked truth that a proper appreciation of symmetry in architecture produces picturesqueness in a natural and unforced manner that is much more satisfactory than the artificial grouping that only looks well from a fixed point. The interest of the whole building is sustained by its parts in spite of its detail. The variety of design in the general forms of the towers and pavilions is pleasing, though the forms themselves are doubtless open to proper criticism from trained Mediævalists, and this variety is wisely used in a building of so regular a plan. The Mediævalism indeed is only skin-deep, the corpus of the whole being of sound architecture, so that our friendly and useful fogs and river mists assisting in the obliteration of its archaeological epidermis, we are enabled to admire in it a fine work of modern architecture.

The Law Courts will come rather differently out of the test, as the marvellous Gothic life which invests its every detail and feature may be chiselled away and the building will still be rampantly Gothic. Reclothe it with Classic or Renaissance detail, and the vigour will still be powerful enough to assert its vitality and claim the building, so long as it has any articulation left, as the *ne plus ultra* of the Gothic revival. The design flings aside almost contemptuously the common properties of the modern architect, claims to be independent of symmetry or repetition, no mere grandeur being aimed at, and repose being despised. Relying on the apparently mistaken supposition that a complete Gothic building must be as broken up in outline as one that is a growth of generations, and upon originality in the design of features and detail alone, success is sought. The wonder is that the building is even as successful, as we must confess that it is, in arousing wonder for the extraordinary capacity of the designer, who almost superhumanly set aside all laws of composition and balance, and fought against the very elements that would have assisted him to an easier success. The building as a whole gives little or no pleasure to anyone who cannot appreciate its motive power of Procrustean Mediævalism, that insists on forcing everything into its ideal mould.

Pull it down; break up its arcades and columns, its pinnacles and staircases and scatter it far and wide, for there is enough of it to give a large store of masonry to the museums of every civilised nation of the globe, and you will doubtless find that the fragments of archivolts and strings and plinths, of corbels, caps and bases, of all the multitudinous variety of interesting detail, will then begin to arouse genuine enthusiasm for their wonderful beauty, originality and vigour, and that the fame of the designer will become a world-wide reputation as a master indeed of all the arts of design. But—and it is a significant "but"—who of us would have much doubt if the most ingenious restorer, whether of Mediæval or prehistoric antiquities, would ever be able, even with all the fragments before him, to reconstruct a reasonable and rational pile of nineteenth-century architecture out of them?

We have buildings, however, enough, of a much more typical class and likely to be much more useful to us in our own careers, in which the really modern elements of fine architecture stand clearly out. Do not fear to be modern. Study and sketch every example that faces a modern requirement and subdues it artistically and renders it beautiful without sacrificing aught upon the shrine of antiquity. A warehouse front, even if stipulated to be wholly of windows with only iron-girder construction besides and a few brick panels, can and should be made as beautiful and interesting a work as a half-timbered front, of which there are many examples, with its continuous and unbroken ranges of windows. And have we not for such classes of buildings resources in new materials that sensibly used would soon be recognised as artistic, such

as glazed brickwork and terra-cotta, only when not used and designed as stonework? Why should concrete and cement building be left to the tender mercies of cheap speculative builders, when we have plenty of need to be taught the value of broad unbroken surfaces in design and long for economical methods for smaller country buildings, where the use of different textures in the finishings of a cemented or concrete wall will give plenty of variety and scope in new directions?

Above all, learn to discriminate, practise upon yourself, examine and try to note down the impressions made upon you by a building, say, of known beauty, and then of one that you see for the first time. Why do you like one? Why are you doubtful about another? Not what features please you merely, but what qualities create the pleasant impression. Train yourself to like and dislike reasonably on good grounds, instead of unreasonably like the amateurish and ignorant world.

The reason why I cannot tell,
But I do not like thee, Dr. Fell,

may do for an excuse for any amount of ignorance in anyone whose business and profession it is to discriminate between good and evil in design, and to bend the whole of his efforts and to marshal all the factors of each building of his hand into harmonious and therefore reasonable beauty.

A hearty vote of thanks was passed to Mr. Pite for his paper.

ARTISTS AND THE PUBLIC.

THE following address was delivered by Mr. Hall Caine at the dinner which was held in Edinburgh to celebrate the opening of the Scottish Arts Club:—

I understand that the great change that the Scottish Arts Club has lately undergone is that of extending its membership by the admission of lay members. This is, I think, a change entirely for the better. Besides the material advantages which a larger membership will secure for the good of all, there is an artistic advantage which artists of all classes may be expected to reap from this effort towards breaking down the barrier which always tries to stand between the man of art and the man of the world. That unnatural barrier shall be my text in the short speech which you have given me the honour to address to you to-night. I have lived much among artists all my life, and one thing I have observed above others is this—that the besetting danger of the artist is the tendency to cut himself off from the work-a-day world, to regard himself as belonging to another race, to draw further and further apart the art world and the world of ordinary life, to keep the general public at arm's length—in a word, to become narrow and self-centred. I know there are always two schools of artists, two creeds of art in this matter. George Sand has cleverly described them. The one disdains the public, thinks meanly of the public intelligence, and regards as vulgar and inartistic all art that is specially designed to meet the slow and dull intelligence of the masses. The other school thinks that artists ought to make themselves intelligible to all, this is what art was meant for, and without it art robs itself of its highest conquest—the power of putting itself into communication with men's hearts and consciences. Well, if I may say so at this festive board, my experience of some artists is, that though they object to being mistaken for preachers, they can be as self-centred as some preachers themselves. When I've heard a certain painter, as famous for his "gentle art of making enemies" as for his pictures, great as they are, inveigh against the art ignorance of the masses, I have been reminded of the German divine who was so proud of his own doctrine that he would not believe that anybody else in the world could so much as comprehend it. "There's only one man in Germany who understands my doctrine," he said, "and he doesn't understand it." But artists of the brush are not the only people liable to become self-wise and stubborn. I have known men of my own craft so set in their own opinion, so settled in their contempt of the opinion of the public, that no failure, no downfall has been enough to disturb their pride. They have resembled the drunken man who, coming to the head of a flight of stairs tumbled down to the bottom, and then, when some one rushed to his assistance, said, "Go away. I don't want any help; that's the way I allus come downstairs." But, gentlemen, there is a great public of limited intelligence and inferior education which it is no degradation to the artist to reckon with. At the Manchester exhibition two factory girls from Bolton stood before Millais's *Huguenots*. They knew nothing of the Massacre of St. Bartholomew and they didn't know what the picture was about. But the expression of pain on the face of the lady affected them to tears and they were wiping their eyes. It puzzled them, however, that the lady should look so sad, being evidently on such excellent terms with her sweetheart. And then there was the handkerchief. What did it mean? At length one of

the girls hit on a bright idea. "I know what's up," she said. "They've been having a stolen meeting in the garden, so as the old folks wouldn't know, and the garden gate has blown to unexpected and clipped the young woman's hand." Fellow-artists, I ask you whether it is not worth while to make your reckoning even with intelligence like that? Remember, the higher your public, the higher will be your art. Lift up your public and your art will be lifted up. This is so of art of all kinds. The better the public for the theatre, the better the drama will be; the better the public for the picture-gallery, the better the pictures will be; the better the public for books, the better the books will be. And artists can contribute to lift up the public by which they are themselves to be judged. I was in Poland two years ago, and saw several of the technical schools which have been established in Krakau and elsewhere by the munificence of Baron Hirsch for the art education of Jewish boys. They are doing a great work, and in another generation they will have wiped out the reproach constantly urged against the Polish Jew that he is a pedlar and a middleman, not a mechanic and producer. They are also doing a great service to the art education of Europe, for they are preparing the way for great artists. Can we not have something of the sort in England and Scotland? Since I came into this room our chairman has told me, to my great delight, that something of the kind exists in Edinburgh. I do not know the Heriot Hospital or the Heriot-Watt College, where there are, I understand, fully equipped workshops for the applied arts and sciences, but all I can say is that as artists, whether painters, musicians or literary men, it is a matter of the highest consequence that we should lift up the art education of the people for our own sakes as artists, if not for the sake of the people themselves. One of my friends, a literary artist of real power, has lately been brave enough to tell the public how stupid the public can be, how many blunders it can make, ranging from the championship of Martin Tupper of "Proverbial Philosophy" in literature to that of John Martin of the *Plains of Heaven* in painting, and in short that neither the public intellect nor what is called the "great heart of the public" is of the least value as a guide in art. Well, I am willing to believe that the public can make mistakes in art matters, but when we see how great are the mistakes of artists themselves, we realise how pardonable are the mistakes of the public after all. Every artist has sooner or later to choose between the two schools George Sand describes, and I confess that my choice was made early. I thought to myself, "I have never met any man yet who could not tell me something I did not know, and the men who can tell me most are (like the sailors who go to foreign countries) the men who live in other worlds than my world." I said to myself, "There may be danger in a too ready submission to the public taste, but if I have anything to say let me not despise the people to whom alone I have to say it; let me make myself intelligible to them, let me speak in their language, even if I have to sacrifice some of the quality of my own; and if I have any good and noble feeling in my soul let me pass it on to other souls, to as many other souls as I can reach and touch." But, gentlemen, the service of the public has its dangers also where the artist is in question. One of these lies in the quest of fame. It is so natural for the artist to desire to be famous. Half the great art works of the world may be said to have been produced by love of the praise of achievement. And it is so natural to conclude that where fame has been won already fame may be won again. Hence there is a danger of running in grooves. But nature does not often repeat herself. It does not often give us the same thing twice. As Emerson says, two really great men of one stamp are hardly to be found in the history of the world. Two really great works closely resembling each other have hardly ever been produced. Nature varies the type. The public is constantly varying in its taste, its want, its circumstance. This is a good thing for some of us. Where should we be if all the world were of the same mind in all the ages? Most of us would be left out in the cold. Then there is always the danger that where art depends largely on the public approval it should seek unfair means of obtaining it. We have heard a good deal about "log-rolling" in recent years, and I dare say fictitious reputations are sometimes rigged up for a while; but that sort of unfair trading is pretty sure to over-reach itself in the end. There is an old story (perhaps none the worse for being old) of a political meeting in America. Whenever a speaker rose to address the audience he was received with cries of "Henry! Mr. Henry! Let us hear Mr. Henry!" always proceeding from one side of the hall. At length, in the midst of these cries and the tumult they occasioned, a little man was lifted on to the platform, and he was invited to speak. But no sooner had he begun than the same cry was repeated. "Henry! Mr. Henry! Let us hear Mr. Henry!" The chairman then said, "I wish that gentleman would keep quiet; Mr. Henry is now addressing the meeting." At that the gentleman who had been making all the disturbance cried, "What? You don't mean to say that's Mr. Henry!

Why, that's the little fellow that's been telling me to holler!" There is another danger in the service of the public, the danger that fame will spoil the artist. We see and hear a good deal of the few men who are killed by adverse criticism, but we do not learn much of the many men who are ruined by fame—ruined to art by the stopping of all artistic growth, ruined to themselves by the world's cruel kindness. It seems as if the moment a man makes a success in the world, the world determines that he shall never make another. If an artist who has suddenly become famous has the temperament of the good fellow, he stands a good chance of being wrecked for life. It seems as if there were a conspiracy of admiration and affection to make him give up to society what was meant for the study. We have all known the wrecks of society—men of genius who ought to have gone higher and higher, but have gone lower and lower because they have served the world too well. Let us never forget that though the ordinary world may broaden our sympathies, enlarge our ideas, feed our imagination, it is in solitude, in the study, in the studio alone that any real art work is ever done. The artist who succeeds must have his head square and level on his shoulders, and indeed all artists in every walk ought to be prepared for whatever fate may befall. I should be sorry to think that great work can ever entirely fail of success. It has not so failed in the history of great artists in any age or country. Shakespeare did not fail, and neither did Raphael. But it is possible for the success that the world allows to artists to be various in kind and quality. It may be wealth and honour and troops of friends with one man, and poverty and unpopularity and the sadness of neglect with another. In the closing incidents of the lives of two great authors, the greatest perhaps of this century—Victor Hugo and Walter Scott—there is a contrast so striking, so pathetic, and I think so thrilling, that I will attempt to describe it as the last words I have to say on this subject. You will remember that after the *coup d'état* of the third Napoleon, Victor Hugo had to fly from France to the Channel Islands. He lived many years in exile, but when Napoleon fell at Sedan, Hugo felt free to return home. M. Claretie tells the story of the home-coming of the great Frenchman on that day, in September 1870. Wearing a soft felt hat and carrying a small travelling bag across his shoulders, Victor Hugo took his ticket for Paris. In the train from Brussels he sat watching with wet eyes for the first glimpse of his old loved country. On the way they passed some of the poor defeated French soldiers, and, thinking to cheer them up, he pushed his head out of the window and cried, "Long live France!" Then night began to come down. It was ten o'clock before they reached Paris. On the platform the poet's friends were waiting for him. They raised a shout, "Long live Victor Hugo!" but there were wounded men in the train, and the shout was silenced. A carriage was in readiness, and Victor Hugo drove out of the station. And there thousands were waiting to welcome him, the great shout was taken up again, and it rolled like thunder over a sea of heads. The poet stood up and bowed and bowed, and the carriage was literally borne along by the multitude. Thus Victor Hugo came back to his country, not a young man as he had left it, but an old man, the idol of the people whom he loved. Now for the closing incident in the life of Scott. Some time after the great failure which wrecked all his fortunes, and nearly robbed him of the house which was his greatest pride, Scott went abroad. In Florence his personality was unknown. One day—I think it was in Florence—he stepped into a printseller's shop and the shopkeeper offered him a print, saying, "This is a picture of the house of the great Scottish novelist." It was a picture of Abbotsford. Choking with emotion Scott turned and went out. Returning to Scotland weak and ill on that home-coming which was to be his last, he could not sit quiet in the coach for his eagerness to catch sight of the beloved house. At length he saw its turrets in the distance, and he could restrain himself no longer. Struggling up, he cried, "There it is, there it is!" and then dropped back weeping. One word more. We hear a good deal about the want of great artists in these days. We are told that there have been no landscape-painters since Turner, no musicians since Wagner, no architects since Pugin, no novelists since Thackeray. Well, it does not become us to say that this is untrue, but if it is so, what is the cause? Is it want of natural genius? Don't believe it. Don't believe that all the genius of the world has suddenly been quenched. My own theory is that, whatever shortcomings our age shows in contrast with other ages is due rather to want of the spirit that inspired our fathers. I believe that it is character that makes the great difference between men. The men of achievement are nearly always the men of character. Napoleon used to say that there was a moment in every battle when the bravest troops felt a desire to fly. That was the moment for the general. He had to step in then and give the word of command, or the battle was lost. Now I believe the difference between the men who succeed and the men who fail is usually that the men who succeed have the voice in their ears which at the right moment when the fight is hardest cries "Forward."

ART IN ABERDEEN.

THE first of a series of popular Saturday evening lectures, arranged by the Aberdeen Artists' Society with a view to popularising the art exhibition and bringing it under the notice of the working classes, was delivered in the exhibition on Saturday evening by Professor Hamilton. Mr. John Keir, president of the Trades Council, presided over a large audience, and in introducing Professor Hamilton said he was sure the lectures could not fail to accomplish the object the Society had in view. He could not introduce Professor Hamilton without making a reference to Mr. Murray, of Glenburnie Park, to whom the Artists' Society, and the working classes in particular, were indebted for his indefatigable efforts and great energy and enthusiasm in this matter. He admitted that the working classes in Aberdeen were indifferent to exhibitions of this kind, but he did not think they were more indifferent in Aberdeen than in other places. He thought also that the reason of the indifference was not far to seek. It was very well known that the workers had too little time at their disposal for mental culture and the development of the finer faculties, but he was not without hope that when more leisure was placed at the disposal of the workers, they would take more advantage of institutions like the Aberdeen Artists' Society, and go in more for art and literature.

Professor Hamilton then delivered his lecture, "A Layman's Impressions of the Exhibition." After a few introductory remarks the lecturer proceeded, the *Aberdeen Free Press* says, to deal with the artist's conception of nature, pointing out that while laymen were constantly looking at objects in nature without seeing them the artist made it his business to observe. But the artist had to do more than this. Were he a mere copyist the result of his labours would be little better than photographic. If he had the true artistic sense within him every line of his brush, every stroke of his chisel ought to idealise, beautify and humanise what was presented to his view. Just as good acting was not a slavish copy of nature so good painting or sculpture limning of any kind was not merely nature but nature subordinated to art. But the quality to do this was rare and should therefore be valued all the more highly, for all professing artists were not geniuses. They had that fact driven forcibly in upon them when they found one of our national heroes represented by a railway sign-post erected upon the most unstable of unstable rocky foundations, our greatest Scottish bard converted into a dancing jackanapes, and our venerable churches, chapels and cathedrals mauled and maltreated by an ignorant architect or decked out in the tawdry splendour of a London gin-palace. The perpetration of such enormities day by day in the streets reminded them that art was a subject requiring to be learnt like any other branch of knowledge. There was, however, no royal road to this education. No man could impart it. All that the best of art instructors could do was to lay down certain guiding principles. The perceptive understanding was a something which springs up after long personal effort. He would, therefore, have every person become his own art critic, for instead of comparisons in art being odious, they were the very means by which a student would come to learn what was meant by art. Let them compare what they saw around them with their own ideal, but of all things let nature be the mirror in which they verified their conclusions. Let them think of what the artist had been endeavouring to teach, and when they began to recognise that what the artist had been trying to teach them was right they were on the high road to improvement. Proceeding, Professor Hamilton said:—We come now to consider what the qualities of a good picture really are, and here we are met with difficulties on all sides. Instead of endeavouring to define to you what a good picture or a bad picture is, I would much rather that you asked me what the legitimate uses are to which a picture may be put. Let me emphasise, however, that there is one style of picture which is unfortunately popular, but which without doubt is radically bad. I cannot better describe it than by saying that you see its counterpart on the backs of Christmas boxes and painted coal-scuttles. And yet how many of our most fashionable artists at the present day, some of them boasting the title of Royal Academicians, are turning out nothing more nor less than this coal-scuttle kind of article. There is the demand for it by the public, and the public gets it. The true test of a good picture is to hang it on your walls and see whether you love it more and more every day of your life, whether every morning when you look at it it breathes to you a message of peace and goodwill towards mankind, whether it elevates you and makes you a nobler and a better man or woman than you were before you became possessed of it. If gorgeousness then is not art what are the legitimate elements which should enter into the composition of a picture?

Well, let me remind you that beauty in nature is a mystery whose influence we all see and feel. Any hard-and-fast line of definition of what it is remains as yet undiscovered; so much so that the artist in painting a picture admittedly beauti-

ful, or in fashioning an ideal in marble, may be regarded as giving expression to the inexpressible. There are, however, certain qualities which, either singly or in combination, enter largely into the construction of a good picture and among these I may mention (1) form, (2) colour and (3) story. There are many others, but these and particularly one of them—namely, colour—stand out prominently. Colour prevails everywhere around us; hence, unless duly represented in the picture, one of its greatest charms will be lost. As to form, just as there is no limitation or rule of beauty in art generally, just as beauty does not reside in the thing recorded, but in the mind of the artist, so there is no canon or standard by which beauty or form can be appraised. Yet, with it all, to him who has reflected upon the subject, there can be only one opinion. The work handed down to us from the ancient Greeks is acknowledged on all hands to be the most beautiful expression of form which we possess, but whether its inherent beauty is solely a matter of lines having a particular curve, or whether it is the perfect adaptation of the various parts to the greatest utilitarian purpose, remains undecided. Grace of form can be given effect to through no better medium than white marble. When we come to use it, however, for mere portraiture, are we putting it to a legitimate purpose? When we perpetuate the memory of a London alderman, an Aberdeen bailie, or, for the matter of that, a University professor, in an actual likeness in marble—a realistic affair in a substance so bland and pure—are we using the proper means to the end in view? What could be more ghastly than a row of busts of the departed executed from a realistic basis. They want only the white sheet around them to make them good-looking stage property. When shall we come to recognise that an ideal subject—a thing of beauty—is a far more pleasing tribute to the memory of the departed than these monstrosities? Give the sculptor a chance. If you have money to spend on marble, put yourself in the sculptor's hands and let him work out his own fancy. But I suppose people will be sculptured and painted in spite of anything which can be said to the contrary, and verily they have their reward. Then as to colour, the colour sense and the sense of colour are, be it remembered, two different things. The colour sense is inborn with most of us—that is to say, we are not actually colour-blind—but the sense of colour is a quality which requires to be cultivated and fostered before it can be enjoyed. We are all constantly looking at colour in natural objects, but very few of us take the trouble to consider how colour effects are occasioned. What, then, is this colour which the artist sees, and which we, the uninitiated, do not see? How can we come to an understanding of it? In attempting to guide you in the matter, let us pull a number of red roses and arrange them in one of those wreath-like clusters which ladies love to paint. You have all seen the article I refer to in our shop windows and on the walls of our drawing-rooms. Paint your roses faithfully as you see them, and examine your work; you will find it is utterly wanting in colour. Undo your bunch of roses and replace them on the bushes from which you pulled them, with leaf, stem, soil, and possibly an old brick garden wall behind them, with a glimpse of blue sky in one corner of the picture, and paint faithfully again what you see. The picture will now be found to be full of colour, and the roses will occupy their right place in the colour scheme. You will see the same thing in what is termed our cold, grey Union Street. Look at the houses as you pass down the street on a sunny day after a shower of rain and notice the intricate interweaving of colours in the granite, more especially in the older houses. Dull grey, pale brown running up actually to crimson, olive green and indigo are the colours which in combination are interpreted by the ordinary observer as grey. Finally, as to story, every picture ought to tell its story, but remember that this story ought to be the artist's own; it ought not to be borrowed. Whenever the artist's craft is employed for illustrating literature or history in a realistic manner it becomes degraded. The story capable of being written in ink is one thing, that which can be recorded in paint or marble is another. Anything of a sensational character or of the melodramatic type serves to lower the picture as a true work of art. The same thing may be said of the ghastly and the horrible. The introduction of an outside story is in reality a confession of weakness on the part of the artist, and when he resorts to it he is dragging his craft through the mire. A picture should essentially be a thing of beauty for its own sake. Its tendency ought to be to enhance the highest flights of the imagination of the ordinary mind by its inherent properties, and the light it lets into our intellects should not be borrowed from extraneous sources. Its beauty should be a thing of colour, form, atmosphere, and all the other qualities which a picture of recognised merit exhibits. For, be it remembered, if we have to go out of our way for its story, if it depicts something which runs counter to what the artist wants to show us, in looking at it our attention is divided between two things, and a sense of confusion and alloyed pleasure is the result. There is a jarring of the two stories, as in listening

to a couple of bands of music simultaneously. The story of a picture ought to be a mystery. It ought to be a thing which we require to seek for, and which ought to grow upon us the more we pursue it. In illustration of what I mean, I think I cannot do better than ask you to stand before Mr. Austen Brown's *Roadside Pasture*. Do you not see humanity shining through the rays of the figure in front and rising superior to the life of hardship which the figure evidently emphasises? Do you not see in the pose of that figure a story of dignity and nobility which no words could express, but which we feel borne in upon us the more we gaze upon it. And yet all this has been told us by the representation of a gipsy out-cast clothed in rags, with an inanimate cow in the background. This is true story-telling in art. We do not require to go back to history in order to understand its meaning. The story is the artist's own, and he has given us a treasure to look upon in recording it.

Mr. Keir proposed a vote of thanks to Professor Hamilton, and Mr. James Murray moved a vote of thanks to the Chairman. The usual evening concert was then proceeded with, while the large company present made an inspection of the pictures.

LEEDS ARCHITECTURAL SOCIETY.

THE first ordinary meeting of the session of this Society took place at the Mechanics' Institute, Cookbridge Street. The president, Mr. E. J. Dodgshun, F.R.I.B.A., delivered the opening address. He first drew attention to the syllabus, which he hoped would prove of great interest. The number of members on the roll was about the same as last session and he thought they might congratulate themselves on their present position. Strength lay in unity. Could they truthfully say they were honestly united in the wish for the welfare of the profession, or were they more anxious about individual success as business men? If not the latter, why was it that so comparatively few of the architects in the district were attached to that Society? The only reason he could give was that they were not sufficiently interested to join. They were not so strong as they should be, consequently their efforts were constantly crippled. If they were united their endeavours would have more weight and they would most undeniably advance their interests. There was a matter which might be made more agreeable to them as a body if they only had unity. He referred to the building by-laws committee of the Corporation and their methods of passing plans, &c. It was positively degrading to be supervised by a set of men—the sub-inspectors—who could not possibly have the experience they, as architects, were supposed to possess, and to have to explain to such how they proposed to carry a wall, ventilate a room or lay a drain. If they really must go on submitting to that state of things, they should at least try to induce the committee to send their inspector to them instead of their having to wait, and often for a very long time, to see him. Why should there exist a building by-laws committee at all? The committee, with one or two exceptions, was composed of gentlemen who had no special knowledge of building, and there was reason to object to those who had, because they were interested in building, either as architects or builders, and by virtue of their office had frequently the opportunity of obtaining information which it was unfair (to the architects sending in plans) that they should have. Would it not be preferable to dispense with the committee and appoint district surveyors, whose duty it should be to see that the laws were not violated or infringed? The inspector had sent into him far more sets of plans than it was possible for him to digest, with the result that sometimes plans had to be deferred, which caused vexatious delay, and was unjust to those anxious to proceed with their work. He need hardly mention, too, the difference between the letter and spirit of the law, but they sometimes had a good deal of trouble in that respect. In London ordinary building plans had not to be submitted to any authority. All that was necessary was to give a couple of days' notice to the district surveyor of intention to build, and he came from time to time to inspect the work and see that the Building Act was not being contravened. Probably the builder might show the plans to the district surveyor at the outset, but they had not to be deposited with him, nor was he furnished with tracings. The Act was so clear and complete that there really was no need for the plans to be approved. They were either right or wrong, and it was therefore not a matter of opinion at all. The plan of the drains had to be submitted to the vestry and approved by their surveyor before they could be put down, but that could be done at any time during the progress of the work, and they had merely to give seven days' notice beforehand. If they wished to do something not provided for in the Building Act, they must see the district surveyor about it, and if he could not deal with the matter the plans had to go before the Building Act committee of the Council. That rule applied, so far as the district surveyor was concerned, to all public buildings,

schools, churches, libraries, &c., but in the case of theatres the plans must be submitted to the Council. Referring to another matter, the President said he thought the city engineer went beyond what should be required of him when he undertook the designing of buildings of an architectural character, such as lodges, park gates, laying out parks and so forth. The city engineer had quite enough to do in his own legitimate line without being expected to make designs for architectural works, and it would be to the city's advantage to appoint an architect for work of that description. The new fish market was ample proof of what he had stated. The year that had just passed had seen some important new buildings completed in Leeds, and much praise was due to the architects. He alluded to the new buildings at the Yorkshire College, the new Medical School, the new Yorkshire Penny Bank, St. Aidan's Church schools erected by the School Board and the new buildings for the Co-operative Society in Albion Street.

A vote of thanks to the President for his address concluded the meeting.

GENERAL.

Mr. Alfred Waterhouse, R.A., is preparing plans for buildings for the Prudential Assurance Company in St. Andrew Square, Edinburgh, the company having purchased the London Hotel for a site.

Mr. J. Oldrid Scott writes to say that a man is calling on various architects and builders representing himself to be a son of the late Sir Gilbert Scott, and asking for assistance. As Mr. Scott adds, "I need hardly say that he is an impostor."

All Saints Church, Norfolk Square, which was destroyed by fire in June last, is to be rebuilt immediately. Mr. Ralph Nevill is the architect. To complete the church according to his designs, the vicar and churchwardens are asking for 2,500*l.* beyond what is at present in hand. It is hoped that the church will be completed soon after Easter, 1895.

The Maire of Ruffey, near Dijon, has insisted on having the *fliche* of the parish church painted in the national colours, the stripes of red, white and blue being arranged longitudinally.

A New Roman Catholic Church is about to be erected in Dunfermline, from the designs of Dr. R. Rowand Anderson, of Edinburgh, which when completed will cost about 30,000*l.*

The Treasury has authorised the payment of 10,000*l.* towards the Aberdeen University Extension Fund for the year 1894-95.

A Site has been purchased in the north-eastern part of Halifax for the erection of a Roman Catholic Church and Presbytery.

Dr. Wm. Taylor presided at the meeting of the Royal Scottish Society of Arts on Monday, when a paper was read by Mr. Ferranti on "Electrical developments of the future and their effect upon everyday life."

The Government it is understood will expedite the scheme for the dock extension at Devonport, on which a sum of 4,000,000*l.* will be expended.

The Death is announced of Mr. C. H. Thornton, architect, of Leeds, at the age of forty-eight years. He had served as secretary and vice-president of the Leeds Architectural Society.

Major-General Sir J. Donnelly, K.C.B., will on Wednesday, the 21st inst., deliver the opening address at the first ordinary meeting of the Society of Arts.

Mr. J. E. Hunter gave a lecture at the meeting of the Glasgow Architectural Association entitled "On Tramp," being a description of tours in Northamptonshire, from Kettering as a centre, undertaken in September of this year.

Mr. Percy Brown, of the Municipal School, Birmingham, has been appointed as draughtsman to the Egypt Exploration Fund.

Mr. E. Stannus gave a lecture on Tuesday before the Sheffield Society of Architects on "The Three Greek Orders—Doric, Ionic and Corinthian."

Mr. J. Oswald, president of the Northern Architectural Association, delivered the opening address of the winter session on Wednesday, the 14th inst.

Mr. Alexander M'Gibbon gave a lecture in the Glasgow Corporation Art Galleries on "Gothic Architecture: its Place and Power."

Mr. T. L. Watson presided at the conversazione of the architectural section of the Glasgow Philosophical Society, and was supported by Mr. John Honeyman, past president.

Mr. C. O'Neill, the author of "The Textile Colourist," and other works relating to Lancashire industries, died at Sale on Monday last.

Mr. J. M. Gray, the late curator of the Scottish National Portrait Gallery, has bequeathed over a hundred volumes relating to heraldry to the Lion Office, Edinburgh.

The Architect.

THE WEEK.

ALTHOUGH Mr. SILVANUS TREVAIL, the architect, is not a member of the Corporation, he was elected Mayor of Truro on the 14th inst. A local paper says that since his advent to Truro, in 1880, Mr. TREVAIL has taken a very prominent part in municipal and county matters, having rendered good service to the citizens of Truro as one of their representatives on both the Town Council and the County Council. As chairman of the sanitary committee of the County Council, he has during the last two or three years done more than anyone else probably to improve the sanitary condition of Cornwall, and for his work in this respect the county owes him a deep debt of gratitude. It is further indebted to him for the part which he played in "The Battle of the Railways" last year. By his prompt and resolute action in acquainting Parliament with the real state of public feeling in Cornwall in regard to the question of railway development, he accomplished an unprecedented feat in inducing the House of Commons to reject the Truro and Newquay Junction Bill, after it had been passed by the Select Committee. By his action in the matter he won the thanks of the whole county, and the feeling of gratitude will shortly find tangible expression in the presentation to Mr. TREVAIL of a testimonial of over 300*l.* value.

At the present time the name of THOMAS CARLYLE is not a strong one to conjure guineas, although a reaction is inevitable. But if the modest house in Cheyne Row, Chelsea, where he lived for nearly fifty years, is not secured, it is certain to be transformed, and hereafter, when CARLYLE'S powers are once more prized, it will not be worth acquirement by his admirers. Another appeal has been made by the committee for subscriptions towards the purchase money and expenses. The cost of the house will be 3,760*l.*, but it is proposed to raise 4,000*l.* When purchased, the property will be invested in trustees; and it is intended that a collection of CARLYLE'S memorials should be gradually accumulated in the house, with a view to its being opened as a kind of museum. Mrs. ALEXANDER CARLYLE, of Edinburgh (CARLYLE'S niece), has offered to place in the house sufficient of the old furnishings to form a substantial nucleus for the collection. Of the numbers that annually visit the house no record has been kept. Last year between six and seven hundred people visited the birthplace at Ecclefechan, and, considering the relative accessibility of the two places, it may be taken as certain that the visitors to Chelsea would be much more numerous. The option of purchase expires on December 31.

THERE is no more effectual way of entombing knowledge than by printing it in a blue-book. Although from time to time there are references to the reports of the Royal Commission on the Fine Arts, that is to say, on the employment of fresco in the Houses of Parliament, yet it is evident that the public as well as many amateurs have only vague notions about the peculiarities of fresco painting. Mr. CAVE THOMAS (who in any other country would have gained eminence in mural painting) is therefore opportune in pointing out that "there is only one proper or *buon fresco*—that in which the painting is made on wet mortar composed of pure lime and clean river sand. Paintings in this method, when properly executed, will stand. The mortar so constituted and used by the Romans has stood in this climate through the centuries and is now as hard as stone. The occasional use of pozzuolana or marble dust in fresco grounds dates from very far back, as may be gathered from the reports referred to. Art critics old enough to recollect the Westminster Hall competitions may be able to call to mind specimens of several methods of mural painting in fresco, in encaustic, on patent cements, &c. Since then KAULBACH in the New Museum at Berlin, and MACLISE in the Houses of Parliament, have used the Waterglass process. In discussing the degrees of durability of various

methods of mural painting, it is too frequently forgotten that the durability of fresco was not the only virtue that recommended it to the great masters; there was before all else its pre-eminence as an architectonic method of decoration. In all attempts to tamper with *buon fresco*, with the object of increasing its permanence, that pre-eminence is more or less sacrificed. All the transcendent mural works of the great Italian masters were executed in *buon fresco*." If the painters had been left to themselves the Westminster paintings might have been more successful, but the chemists were able to persuade the Royal Commission about discoveries of means to overcome time itself, and in consequence the scientifically prepared frescoes have either vanished or become invisible.

THE facilities for reproducing old etchings will keep ALBERT DÜRER'S reputation undiminished. The copies which are seen in Mr. LIONEL CUST'S "Portfolio" monograph, "The Engravings of ALBRECHT DÜRER," are almost as valuable for the purposes of study as the costly originals. The selection does justice to the various characteristics of the German artist. Mr. CUST'S memoir is learned and judicious. The subject is fascinating, for DÜRER suffered in silence throughout his life, but whether the cause was hypochondria or domestic broils can never be determined. If he were happier his work would have assumed a different sort of character, and DÜRER'S misery may have benefited the world.

ON Tuesday the Lord Provost of Edinburgh introduced the subject of the Municipal Buildings. He said, "If we are to do the city's work properly we must have suitable rooms in which to do it. The accommodation in the City Chambers at present is far too limited, and we shall require to face the extension of the present buildings in the near future. Under the able superintendence of the Dean of Guild, who is taking a deep interest in the matter, and of the city architect, Mr. MORHAM, I have no doubt a plan will be produced which can be carried out at as small a cost as possible." It may be granted that it is possible to make arrangements which will not impose a heavy tax on the citizens. But is economy to be the only consideration? The people of Edinburgh to a large extent are enabled to live in prosperity by the attractiveness of the city. If every building in it had been "carried out at as small a cost as possible," the citizens would be as poor as their predecessors in the last century.

JUDGMENT has been given by Sheriff HENDERSON in the Greenock Court in a case where Messrs. M'ARTHUR & ORKNEY, factory architects, sought to recover 45*l.* 4*s.* 6*d.* for professional services. They were asked by the manager of the Brewers' Sugar Company, Limited, to prepare two designs. The plea put in by the company was that the employment was gratuitous. There was no doubt that more extensive premises were arranged for than were originally proposed, and the plaintiffs therefore offered their services at very low rates. The Sheriff, in giving judgment for 37*l.* 6*s.* 6*d.*, said he did not think the company dealt fairly with the account, by admitting the fee of 2*l.* 2*s.* and maintaining that 20*l.* was an excessive charge for a mere preliminary design. A few shillings would be sufficient for the draughtsmanship of the designs, but what the plaintiffs chiefly required to charge for was the time and labour expended previous to putting pen or pencil to them. The plaintiffs had, however, in his opinion failed to prove that the design referred to was adopted by the company. Instead of erecting a sugar store at the estimated cost of 2,680*l.* as originally proposed, the company had erected a factory costing 6,000*l.* The designs were prepared by Mr. HOUSTON, who had never seen the plans prepared by plaintiffs. There were undoubtedly some features in common between the two designs, and the Sheriff thought these were probably suggested by the manager, to whom the plaintiffs' designs had been previously submitted. This might entitle plaintiffs to a higher fee than they could have reasonably claimed if their designs had been absolutely useless to the company, but it was not sufficient in his opinion to justify so high a fee as that charged on the assumption that the complainers' designs had been adopted by the defendants.

JEAN BOULONGNE.

TO be a "model man," an example of all the proprieties, is not always an advantage for an artist who aspires to fame. It is natural to suppose that the most legitimate way to insure immortality is by works. There is no certainty, however, that works of art will be preserved, and it often needs only the operation of a short period of time to deprive them of interest. An artist who has taken part in dramatic scenes can aspire to be remembered, although his productions are unknown.

■ The contrast between the fate of BENVENUTO CELLINI and his contemporary, JEAN BOULONGNE, JEAN BOULOGNE, JEAN DE BOLOGNE, GIOVANNI DA BOLOGNA, and JOHN OF BOLOGNA, is an example of our meaning. There are very few examples of sculpture or jewellery which can be accepted with certainty as CELLINI's, and they are not all masterpieces. Yet it may be assumed that, in spite of the deficiency, his hold on posterity will remain as long as MICHEL ANGELO's or RAPHAEL's. To the majority of people his adventures are of as much importance as the works in the Capella Sistina or the Camera della Segnatura. Almost all of the works of JEAN BOULONGNE, on the contrary, have been preserved, and yet his name is nearly effaced from the historic scrolls. His sculpture is far superior to CELLINI's, and MICHEL ANGELO would be likely to have allowed that JEAN was the best of all his imitators. But his life was devoted to his art; he was not known to be the hero of the simplest sort of drama, he discharged all his obligations, and was never known to have defrauded or killed a man, and in consequence the world has become indifferent about him, if not about his works.

JEAN was one of the very few foreign artists who were able to obtain commissions in Italy, for although the Italians considered they possessed a right to employment in all lands where art was esteemed, they were not disposed to admit that they required the aid of strangers. In their conduct the artists imitated the Churchmen. That an exception was made in BOULONGNE cannot be doubted, and from what is said by VASARI it would seem that there was not much jealousy about the patronage he obtained:—

The Flemish sculptor, Giovanni Bologna, of Douai, is also of our Academy, and his remarkable ability has caused him to be much in the favour of our princes. He is, indeed, a young man of singular talent, and it is by him that the new fountain on the Piazza of San Petronio, opposite to the Palace of the Signori at Bologna, has been constructed. Among other ornaments there are four syrens at the angles, which are exceedingly beautiful, as are also the children and fanciful masks by which it is surrounded. But the most remarkable part of this work is a figure of *Neptune*, six braccia high, placed over the centre of the fountain, and which is a most beautiful casting, the figure being studied and executed to perfection. And, not to speak now of what this artist has produced in clay, terra-cotta, wax and other materials, he has executed a beautiful *Venus* in marble, and almost completed a *Samson*, the size of life, in combat with two Philistines, for the Prince. He has likewise made the figure of *Bacchus*, in bronze, larger than life, and in full relief, with a *Mercury* in the act of flight, which is very ingenious, the whole figure resting on the point of the foot. This has been sent to the Emperor Maximilian, as the extraordinary work that it certainly is. But if Giovanni Bologna has hitherto produced fine works, still finer may we expect from him in the future, seeing that the Prince, after giving him rooms in the palace, has lately commissioned him to execute a statue of five braccia high, representing the Goddess of Victory with a captive, and this work, which is to be placed in the hall opposite to one by Michel Angelo being accomplished, Giovanni will be employed on many other great and important undertakings for the same Prince, thus obtaining a wide field for the display of his powers.

It is remarkable to find so genial a notice of a young foreigner coming from VASARI. He was prepossessed not only by the ability of JEAN BOULONGNE, but also from the connection of the sculptor with a builder who carried out works designed by VASARI, and it may be from the admiration of MICHEL ANGELO, which the Fleming and the architect held in common.

The number of works credited to the young Fleming by VASARI must appear incredible. It should be remembered that he was an efficient sculptor at an early age and when commissions were given to him he completed them quickly. His energy was as dominating as MICHEL ANGELO's, and whatever may be their shortcomings in other ways his figures appear to be first thoughts. In productiveness there is a resemblance between BOULONGNE and RUBENS. Both can express movement and vigour in a marvellous way, and consequently scenes in which brute

strength overcomes resistance have an attraction for them; but RUBENS's animalism is compensated by his colouring, while in the case of BOULONGNE we must be satisfied with the flexibility which marble and bronze appear to have assumed under his hands. The Flemish sculptor apparently was eager to produce figures which the crowds in a public place could understand at the first glance; he therefore avoided subtleties of all kinds and, as a consequence, there is no revelation of a hidden meaning, however long we may study his works. It is by that absence of an occult significance the works of the imitators of MICHEL ANGELO's muscularity can be always separated from those of the great Florentine. But with BOULONGNE there is at least the satisfaction of feeling that he was not vain of his anatomical knowledge, and therefore we do not see from his hand such distorted figures as were common with his contemporaries. Whatever he attempted he executed in a workmanlike style, and as within the limitations adopted his groups are generally successful, it is difficult to resist the conviction that BOULONGNE was competent to produce many figures that would bear comparison with his *Mercury* if he cared to free his powers from restraint.

The story which is introduced by Sir JOSHUA REYNOLDS in his tenth discourse is by itself enough to suggest, that BOULONGNE and his friends invented subjects without much trouble to themselves, and the President accepts it as an indication of the true province of sculpture, which was confined to attitude and action:—

Take from Apollo his lyre, from Bacchus his thyrsus and vine leaves and from Meleager the boar's head, and there will remain little or no difference in their characters. In a Juno, Minerva or Flora the idea of the artist seems to have gone no further than representing perfect beauty, and afterwards adding the proper attributes, with a total indifference to which they gave them. Thus, John de Bologna, after he had finished a group of a young man holding up a young woman in his arms, with an old man at his feet, called his friends together to tell him what name he should give it, and it was agreed to call it the *Rape of the Sabines*, and this is the celebrated group which now stands before the Old Palace at Florence. The figures have the same general expression which is to be found in most of the antique sculpture; and yet it would be no wonder if future critics should find out delicacy of expression which was never intended, and go so far as to see in the old man's countenance the exact relation which he bore to the woman who appears to be taken from him.

There is little doubt about the error of REYNOLDS when he assumed that figures by Greek sculptors are only to be differentiated by means of certain symbols and attributes. The characterisation was expressed in other ways. But what he says reveals that in the eighteenth century a want of definiteness in intention when undertaking a sculptured figure was not considered a disadvantage. Assuming that REYNOLDS expressed a tradition of the studios, there is consequently some excuse for BOULONGNE when he thought far more about the effect of the contours of his groups on the multitude ("his groups," says FLAXMAN, "are harmoniously incatenated") than about the meanings which a few meditative men might infer from them. Neither BOULONGNE nor REYNOLDS cared much for the refined critics who please themselves in discovering "delicacy of expression which was never intended," and they resembled TURNER, who was not grateful to Mr. RUSKIN for efforts which had a similar tendency.

BOULONGNE it should not be forgotten was a Fleming, and retained to the end of his life many of the qualities of his countrymen. He was born at Douai, about 1524. If he accepted the destination prepared for him by his parents he would have been a village notary, but when he was sixteen he went to Antwerp and became a pupil of JACQUES DUBROECK, one of the Flemings who had studied in Italy. That master used to recommend all his pupils to seek instruction in Rome, but owing to his poverty, JEAN BOULONGNE was unable to set out on the journey until after a period of ten years had elapsed. His two companions were CORNILLE, who was an architect and sculptor, and who is said to have designed the Antwerp town hall, and FRANC, a painter. At that period it was the ambition of all young sculptors to become acquainted with MICHEL ANGELO. The Fleming modelled a wax figure with all the care he possessed and submitted it to him. MICHEL ANGELO transformed it and advised JEAN BOULONGNE to learn to sketch in the first place, and the power to finish would follow. Apparently that was JEAN's only encounter with the sculptor, but it was sufficient to confer prestige upon

him, and some modern writers on the strength of it do not hesitate to say that JEAN BOULONGNE was among the very few pupils of the master.

The Romans were not disposed to patronise foreigners, and JEAN BOULONGNE resolved to return to Antwerp. As he passed through Florence he met BERNARDO VECCHIETTI, one of the influential amateurs of that city. By his advice BOULONGNE rested in Florence, and was received in VECCHIETTI'S house. He endeavoured to become useful, and was glad to carve balusters and consoles until the opportunity to produce statues arrived. For an example of the latter it was necessary to possess a block of marble, which in those days was costly in Florence, owing to the difficulty of carriage. Every one remembers the story of the partly used block for which so many contended, and which eventually MICHEL ANGELO obtained and converted into his *David*. The disposal of the block out of which AMMANNATO carved the *Neptune* gave rise to as many intrigues in the Florentine Court as if it were the viceroyship of a kingdom. BOULONGNE was more fortunate than greater men, for his patron presented him with a block for his *Venus*, his first work of importance, which at once secured the interest of FRANCIS DE MEDICIS. The Fleming was offered quarters in the palace and a salary of thirteen gold crowns (afterwards increased to twenty-five crowns) was assigned to him. That commissions at once came in abundance is evident from VASARI'S list, which, as we have seen, comprises not only the *Samson and Philistines*, the *Bacchus* and the *Mercury*, but the fountain in Bologna; the last, however, was designed by TOMMASO LAURETI, the painter. At the time of their completion BOULONGNE was described by VASARI as a young man.

He was, however, thirty-five when he produced his *Samson* group and may have reached his fortieth year when he completed his masterpiece, the *Mercury*—a figure which, it is supposed, inspired SHAKESPEARE'S lines about the feathered god alighting on a heaven-kissing hill, although the sculptor substituted a head of one of the wind spirits for a hill. It was an age when mythology was in fashion as well as a liking for the colossal, and JEAN BOULONGNE was ready to produce works of both sorts at an hour's notice. His groups have also the advantage of effectiveness when seen in the open air. The Ocean and river goddesses in the Boboli Gardens form a combination that offers an acceptable contrast to the prim lines of the Italian gardeners, and the *Sabine Group* would appear far more satisfactory if it could be taken out of the Loggia and set up in a public place. The *Victory*, or, as it is sometimes called, the *Virtue and Vice*, suffers from its proximity to MICHEL ANGELO'S group in the Palazzo Vecchio, and would we believe gain more admiration in a position out-of-doors where it did not provoke a contrast. BOULONGNE was so addicted to mythological representation, he was not at his ease either with portraits or ecclesiastical figures. His *St. Luke* is about the worst of the series in Orsanmichele. The equestrian statues of *Cosmo I.* and of *Ferdinand I.* are barely tolerable. His statue of *Henri IV.*, which stood on the old Pont Neuf, is only to be judged from the slight indication of it in views of Paris. His ornament, nondescript figures for fountains, torch-holders, &c., are among the most interesting of the Renaissance examples.

As BOULONGNE rarely executed figures on a small scale, examples of his works are almost unknown out of Italy. An *Esculapius* by him was said to have found its way to Meudon and a *Cupid and Psyche* to Versailles. He received offers of commissions from France, Spain and Germany, but the Grand Duke would not allow him to accept them unless he had received official approval. It was therefore necessary to negotiate with the MEDICI for a figure by the sculptor, and diplomatists may not have cared for the duty. BOULONGNE did not suffer. In a communication to a Duke of URBINO he is described as having a thousand things in hand, and as being unable to satisfy all the demands for his work, although he never lost an hour by day or night, for he could undergo excessive fatigue without repose. In spite of his excessive labours, he lived to the age of eighty-four. He gained a large income, but he lived as a grand seigneur, and he took care to be buried as one, for he expended over six thousand golden crowns on a monument in the Nunziata. His property he bequeathed to a nephew from Flanders, whom he treated as a son.

BOULONGNE'S life was singularly free from the excitement which arose out of the competition between other artists of his time. His name is associated with only one competition, and he took part in that on the understanding that he was not to be recognised or rewarded. It arose out of the immense block of marble which BACCIO BANDINELLI arranged for in the expectation of using it for a group of *Neptune* drawn by six horses. When afterwards it was purchased by the Duke of FLORENCE, several sculptors endeavoured to oust BACCIO from his lien on it. After his death a competition was arranged, in which JEAN BOULONGNE took part. But the Duke declined to look at his model, although it was said to be superior to the others, because the Fleming had not at that time undertaken a work in marble. Through the influence of VASARI the commission was secured by AMMANNATO.

The passionate rivalry between artists appears to have subsided towards the close of the sixteenth century. It was, we suppose, perceived that an industrious and quiet man like the Fleming was more likely to carry off a succession of prizes than belligerents of the CELLINI type. Whatever was the cause, when after the fire of 1595 it became necessary to construct bronze gates for the cathedral of Pisa, to take the place of those which had lasted for four centuries, it was decided to leave the whole work in the hands of JEAN BOULONGNE. That course was different from what took place in the case of the Florentine Baptistery, for although there were great sculptors in the city, all the masters in Italy were invited to compete. The Fleming employed numerous assistants, who made models in wax from his sketches, and he entrusted the casting to DOMENICO PORTEGIANI, a monk who had before co-operated with him. The gates have not the charm of Ghiberti's, and in several of the reliefs there is a lack of repose, for he cared only for movement; but they form a most worthy crowning work for the career of the sculptor, who if not the greatest was the most fortunate of all those who laboured in Italy during the sixteenth century, and their production without any hitch or dispute suggests the organising power which was one of the causes of his unexampled success.

NOTES ON THE GREAT RAILWAY STATIONS OF LONDON.—IV.

[BY A CORRESPONDENT.]

(Concluded.)

THE modest-looking red brick façade of the St. Paul's Station of the London, Chatham and Dover Railway stands rather at a disadvantage, owing to directly abutting a high viaduct which dwarfs the small towers built at each end. As regards the exterior, this is certainly the least vulgar of any of the London examples, and possesses some real architectural claims. Moreover, it looks like what it is, viz. a booking-office on the ground floor with clerks' offices above, being only a two-storeyed building. The name of the station is tastefully shown by gilded projecting letters, and those of the various towns, &c., to which passengers can be booked are arranged in incised gilt rows on the two pilasters, thus forming a decorative feature. Now all this shows much better taste—the incorporation of names of places as a part of the construction, instead of the far more common "railway-station style" of big painted boards, though the exact mode of doing this might have been improved upon. The way in which the width of the large semicircular headed windows to the booking-hall is broken up by divisions into ornamental panels separated by delicate wood bars is happy. This also tends to bring these windows more into scale with the rest of the building. As Queen Victoria Street is of good width and the front of the station is no great height, a good view can be thus obtained. The booking-hall is fairly lofty, and the bressumers carrying the rooms above have panelled soffits, with timber trusses of ornamental character under. The ticket-offices are of better appearance than in most stations, but when the passenger has ascended the first broad flight of stairs, he comes to a moderately wide gallery about the whole width of the station, though of insufficient height. Here he will find numbers of people waiting till the wicket-gates of the several smaller staircases leading up to the platforms are unlocked

by the guard. This waiting-space certainly looks inconveniently crowded, though the writer saw it about four o'clock on a Saturday afternoon after the great rush of City men homewards. The station proper calls for no particular remark.

The great terminus of the Midland Railway at St. Pancras is without doubt the finest one in London, though the next and last to be commented upon runs it very hard. The St. Pancras example, too, is less disfigured by those sordid though strictly necessary accessories, commercially speaking, for the dividends, than is the case in other stations. For instance, the advertisements are far less obtrusive. The magnificent Hotel must not be commented upon, for this article is about *stations*. Sir GILBERT SCOTT was much hampered in having to provide ample carriage entrances through the Hotel, of sufficient height and dignity, while still carrying a continuous corridor through the upper floor. On the whole the treatment of this unwelcome intruder has been well managed, though the ironwork supporting it is designed in the ultra-Gothic fashion which would at the present day be called "Philistine." But the composition of the covered glass carriage-roof in front of the booking-hall is a distinct advance over those in other stations, showing how the artistic perceptions of the architect have been employed. This is also shown by the handling of the spandrels to the brackets supporting the roof, the construction of which is simple and unadorned enough, the span being small and no engineering difficulties existing. About this station it may be said that beyond the Hotel frontage and general approach there is really no exterior to speak of. The fine booking-hall with its open-timbered roof and beams of that ample scantling of which Sir GILBERT SCOTT was so fond is very effective, and the ticket-offices instead of looking like ugly shed excrescences rather err in the other direction, being somewhat overdone in ornamentation, all too executed in that costly material—wainscot oak. The stop-chamfering, after the French manner, so ably illustrated in VIOLLET-LE-DUC'S "Dictionnaire," was a prevalent weakness with English architects at the time this station was built and can be smiled at now. But of course this foible does not affect the general conception of this noble structure. It was and will be a very rare occurrence for an architect to have such a "fling" and the *carte blanche* as in this instance—to design not only the principal but the smallest fittings of an enormous railway terminus, such as the oak frames to the time-bills and even the framing to the luggage label collection—also the "sentry-box" in which the official jots down his memoranda as the cabs are driven through the exit archway. There was an awkward point to be dealt with in the management of the screen at the upper part of the south end of the station, only the lower portion of the Hotel being open to it. Herein lies an essential difference as compared with the Charing Cross and Cannon Street stations. There had to be sufficient space between to light the upper rooms of the back part of the Hotel, and this interval has a span roof with axis east to west. The engineer had consequently to provide visible girders of enormous strength to carry this immense screen. The writer believes the treatment of this was a great crux to Sir GILBERT SCOTT, so that it might harmonise with the architecture, and it was well got over too. In the construction of the station roof the engineer has dispensed with tie-rods, and relies on great lattice iron girder trusses at intervals, with trussed purlins and long diagonal ties stretching across the surface of the roof, the latter glazed on the narrow ridge and furrow principle in a very effective manner. The mode adopted here, with an uninterrupted central area of glass, is much the most pleasing, a treatment in other stations which has been previously alluded to. When the handsome tile frieze to the roof was being fixed all flush, it was found the effect was poor, and some of the tiles were therefore set back a little, which was a great improvement. Yet looked at from below, it is difficult to realise all are not in the same plane. All this shows the minute attention to detail paid by the talented architect. The east side of the station is practically all roof, as the inferior offices are too low to "tell," and the chimneys with the huge mass behind them ought by rule to smoke. The west side is masked externally partly by the wing of the Hotel and also by the great goods station, with a road between, only used for access to the

latter. Taking it altogether it is most refreshing to observe the care and study bestowed on this beautiful building as compared with some of the other examples previously touched upon.

The Great Eastern Railway terminus at Liverpool Street is on the whole, in the opinion of the writer, the most interesting one in London, and probably has the largest amount of local daily passenger traffic. It has been indeed no easy matter to quietly study its architectural peculiarities, for "star-gazing" in its precincts puts a man rather out of touch with the busy, hurrying throng around, while the porters, with their modern ejaculation of "By your leave," oblige one to attend to mundane matters, or the penalty is to have one's toes run over. This is of course more or less the case in other stations, but the one in question bears the palm of being the most bustling of all. The plan of this great building, with its very important eastern extension, barely complete, is somewhat intricate—very different to that at St. Pancras, for the booking-offices of the main line are on the low level, and those of the suburban and local traffic on the high level. Hence the great number of gallery passages, foot-bridges and staircases at all angles and in various directions. But the worst of it, artistically, both in this and other big stations is that all seem like after-thoughts, put up regardless of appearance—utilitarian to the last degree. Therefore the lattice girder principle, as at King's Cross Station, has been adopted, with the footway hung on stirrups. The connection of the old station with the very large supplementary one on the east side, owing to the exigencies of the site, must have been no easy matter, and has involved unusually long, tortuous bridges for passengers. The adaptation of the thirteenth-century style to the Hotel, station and offices is of course now not fashionable, but the ornamentation is not overdone, which is more than can be said of much of contemporary architecture. The buildings in general certainly form a somewhat imposing pile, as viewed from Liverpool Street, which is helped by the clock tower, though that is rather in the background. It is superfluous to say that in point of grandeur and architectural merit this structure is inferior to the rather overdone terminus at St. Pancras, but is quiet and modest in its character, not to say mediocre. The plan of the older station may be said to consist of two wide span-roofed "naves," with narrower north and south aisles, the latter having span roofs to each bay at right angles to the main roof, opening partly into it. At the south end, next the west local station, is the "transept" roof intersecting that of the "nave," the diagonal trussed ribs of which give somewhat the suggestion of groining. The effect of the two columns (with axis east to west) dividing the two "naves" and placed some way apart has a bold appearance. This intermediate space is roofed, bay by bay, at right angles to the main roof. The design of the ironwork is rather more ornamental than in the generality of stations, but in other respects is of the usual type. The treatment of the (unglazed) lancet "windows," with the graduated quintet in the upper part of the transeptal west gable and the triplets to the sides of the "aisles," is somewhat ecclesiastical looking; moreover, too, much suggesting the presence of non-existent vaulting. The manner in which the easternmost "nave" roof is carried on, *per se*, past the main line booking and other offices, &c., on the east side into the north end, which is on a splay plan, must have been schemed with some amount of skill. Everything works in very well and the continuity of the roof is maintained, the south "aisle" being curtailed in width part of the way. The booking-hall of the main line is a fine lofty apartment, though purists might say it was wrong in principle to have three tiers of windows in it. But under the uppermost tier runs a gallery, carried on cantilevers, which gives some reason for the treatment adopted. The front of the Hotel at the end of the platforms scarcely attracts any attention, owing to the plan of the station and the presence of the footbridge just in front of it. The north end of the older station is not glazed at the springing line of the roof, like most other examples, but is quite open. The spandrels here externally have poorly designed panels in them. But for all practical purposes this end of the building is invisible from the outside. The west side of the station proper is next to a long goods yard adjoining the

North London Railway Terminus, so is scarcely seen. The semicircular arches and wall over, dividing the older and the new station, are treated in a pleasing as well as bold and substantial manner, likewise the effective blind-storey, or kind of arcade just under the roof. The extension is constructed on the more practical view of lesser spans and consequently less height up to the wall-plate, and consists of four "aisles" of equal width with a non-intersecting transeptal roof next the entrances, running independently of the other roofs the whole width of the station. So there are thus four arches to see opening out of the transept. As the booking-offices are on the high level there are no less than three staircases down to the platforms, the central one T-shaped at the lower part in order to diminish its projection into what is an unusually wide and ample space in front of the platform wickets. The two end staircases are in one flight. A new departure in railway station arrangements has been made in this instance, for instead of the usual wooden structures to serve for lavatories, &c., there are here four substantial little buildings of brick and stone, with one or more staircases leading down to a basement, lighted from the pavement. The space thus gained on the ground-floor level is advantageous, as has been remarked, avoiding crowding. But it is questioned whether the majority of passengers, who are generally in a hurry, will like having to rush up and down these certainly well-lighted steps, and run the risk of tripping or jostling against each other on a staircase, which is very different to a level pavement. The ends of the "transept" are treated in an ornamental way, in, say, the Neo-Renaissance style. That next Bishopsgate Street has window-like openings with very elegant wrought-iron grilles in them, the remainder of this façade being unpierced. It is to be regretted that offices had to be built over the north end of the station, as this has a deadening and depressing effect. But "Necessity knows no law." Externally the east elevation of the transept is handsome, flat at the top to some extent, but still suggestive of a roof behind. "The East Side Suburban Station," to use the official title, has a front of good appearance, red brick with freestone dressings, and looks what it really is. One enters a noble booking-hall (barely yet finished) with ticket-offices and walls of wainscot, handsomely though quietly panelled, one on either side of the principal doorway, arranged somewhat on the principle of a splayed bay-window, but the cornice, &c., is continued over this entrance with a panelled soffit. Moreover, the inner doors open back like shutters on the bevel. The jambs of the doorway are on a bold rounded plan, as if to withstand the expected rush and crush of the numerous daily and other passengers. The booking-hall is wainscotted all round to a good height, and is not overdone with ornament, while the proportions are very pleasing. Altogether it is the most successful feature of its kind in London.

What a vast change has been effected in a dingy part of Bishopsgate Street by the extensive range of handsome, well-designed, red brick and freestone buildings in connection with this terminus, instead of the poor-looking tenements that used to be there! The ground storey, except at the north and south ends, is devoted to shops, and the upper portion, it is to be presumed, for station offices. There are two fine carriage arched entrances at the north end of this great block, and a goods booking-office with picturesque turret. It may be added that some really good perspective effects can be obtained from the interior of the new station, looking towards the older one.

The writer had intended to have made some general suggestions at the end of this article, but has rather exceeded his limit already. Moreover, while describing the various railway stations, he has endeavoured to draw some conclusions from each. It ought to be remembered that there are a considerable proportion of people who for various reasons have to wait about, so that care bestowed on architectural details is not thrown away, because many are unobservant and hurried. Also the division of a large terminus into several aisles is preferable to the huge one-span roof, both for practical and artistic reasons, while it is less costly, too.

The Surveyors' Institution meet on Monday, the 26th inst., when Mr. A. Dudley Clarke will read a paper entitled "The Incidence of Taxation on Land."

THE ROYAL SCOTTISH ACADEMY.

AT the annual meeting of the Royal Scottish Academy the following report was adopted:—

The Council for the year ending November 14 have to report to the annual assembly of Academicians as follows:—The sixty-eighth exhibition was opened on Saturday, February 17, and was closed on Saturday, June 9. It contained 447 paintings in oil and water-colour, 38 works in sculpture, 33 architectural drawings and a number of etchings. At a statutory assembly of Academicians held on March 7, it was unanimously resolved that no addition be made to the number of Associates this year.

The following is the report of the librarian and the curators of the library:—The following works, besides art periodicals and the Arundel Society publications have been added to the library:—"Kuskin on Music," edited by A. M. Wakefield, 1894, 4to; "Verona and other Lectures," by John Ruskin, D.L., LL.D., with illustrations from drawings by the author, 1894, 4to; "Letters addressed to a College Friend during the years 1840-45," by John Ruskin, 1894, 8vo. The following works have been presented to the library:—"Rembrandt: His life, his work and his time," by Emile Michel, member of the Institute of France. From the French by Florence Simmonds. Edited by Frederick Wedmore. With 67 full-page plates and 250 text illustrations. In two volumes. 1890. Imp. 4to. Presented by Sir George Reid, P.R.S.A.—"Illustrated Catalogue. Victorian Art Gallery." Edition de luxe. No. 123. 1894. Presented by the Trustees of the Public Library, Museums and National Gallery of Victoria per Vice-President.—"Umrisse zu Goethe's Faust," gezeichnet von Retsch. Demy 4to. n.d. Presented by Alexander Fraser, R.S.A.—"Die Malerei in Schottland." Von Cornelius Gurlitt. Illustrated. 1893. 8vo.—"Japanese Sketch-book," containing 66 coloured plates, in three volumes. 8vo. Presented by Otto Leyde, R.S.A.

The visitors of the Life School report as follows:—"The session of 1893-94 commenced on November 13, 1893, and ended on June 29, 1894, having had 120 morning and 122 evening meetings. The aggregate morning attendance was 953 and the aggregate evening attendance 952. The number of students on the roll at the end of the session was nineteen. It is gratifying to report that the students have worked with industry and enthusiasm during the session. The visitors desire to allude to one who for many years was intimately connected with the school, the late Clark Stanton, its esteemed curator. They are sure the students feel with them that his death is a loss to be deplored.—(Signed) HUGH CAMERON, ROBERT ALEXANDER, WM. HOLE, ROBERT M'GREGOR, Visitors." After a careful examination of the students' work done during the past session, the Council, who have pleasure in testifying to the general excellence of the work, especially of the studies in black and white, awarded the prizes as follows:—

The Chalmers Bursary—C. S. Brown and George Gibb—equal; the Chalmers-Jervis Prize for the best drawing from the life—J. T. Murray; MacLaine Watters Medal—C. S. Brown; the Keith Prize—George Smith; the Stuart Prize—George Cruickshank.

The Council regret having to record the death during the past year of two Academicians, an honorary member and an Associate of the Academy, viz.:—Mr. Clark Stanton, R.S.A. (January 8); Mr. Gourlay Steel, R.S.A. (January 31). Mr. William Calder Marshall, R.A., one of the honorary members of the Academy, died in London on June 16; and Mr. Charles G. H. Kinnear, A.R.S.A. (November 5). Mr. Kinnear, it was stated, was present at a meeting of the Alexander Nasmyth Fund Assembly held in the library on the afternoon of November 5 (the day he died), and spoke in support of a resolution.

The Academy have petitioned the Queen in Council to grant a supplementary charter instituting an order of honorary retired Academicians and Associates, and on conferring certain other powers for the better government of the Academy. This petition was lodged with the Privy Council in July, and the Academy respectfully waits Her Majesty's gracious pleasure in its consideration.

The Council have to report that, in accordance with the terms of the will of the late James Nasmyth, engineer, of Hammersfield, Penshurst, Kent, the second and final share to the Academy of the residue of his estate, consequent on the death of his widow in October 1893, has now been paid to the Academy as part of his munificent bequest for decayed Scottish artists.

Office-bearers were elected, and the Council were declared for the ensuing year as follows:—Council, Sir George Reid, president; Hugh Cameron, Otto T. Leyde, W. F. Vallance, Robert Alexander, Robert Gibb, William Hole; George Hay, secretary; John Hutchison, treasurer; William Hole and Robert Gibb, auditors; Otto T. Leyde, librarian; Hugh Cameron and W. F. Vallance, curators of library; J. L. Wingate, Robert Gibb, T. Austen Brown and C. Martin Hardie visitors of the life.

EDINBURGH ARCHITECTURAL ASSOCIATION.

THE session of the Edinburgh Architectural Association was inaugurated on the 16th inst. by a conversazione held in the Royal Institution. There was a large attendance of ladies and gentlemen, who were received by Mr. W. W. Robertson, president of the Association. The President afterwards delivered an inaugural address. He called attention to an exhibition of fine old engravings of Edinburgh, and especially Edinburgh Castle, which had been made by the late Mr. William Nelson. Passing on, he said his attention had been drawn to the recent addition to the Advocates' Library of the manuscript journal of James Playfair, extending over the period from 1783 to 1793. He had read the journal, and found it to be a plain business record of journeys taken, work done and accounts rendered. A good deal was disclosed that was interesting, glimpses of the habits, the life and the work of the time, but not, on the surface at least, very much of the man. He explained that James Playfair was the father of their William Henry Playfair, and the brother of that Playfair who had been Professor of Natural Philosophy in the University of Edinburgh. To them he was interesting as the father of the distinguished architect of Donaldson's Hospital, of the building in which they were then assembled, and of many others which ornamented the city. He was a Scotsman who had migrated to London and established himself as an architect in Russell Square. Mr. Robertson then quoted freely from the journal, beginning with business entries. Perhaps to them the most interesting part of the journal was the mention of Playfair's journeys to Scotland every year. The names in the record had a pleasant and familiar sound, the 1783-84 visit being explained by the note:—"Was sent for by Lady Glasgow, and likewise went to Raith with Mr. Ferguson on his business and spent a week on his affairs." In successive visits the same names appeared and reappeared—Dalkeith Palace, Melville Castle, Bothwell Castle and others. Evidence of the great industry of the author of the journal and the diversity and prosperity of his work were then cited, the narration being listened to with much interest. At the close of his address Mr. Robertson was, on the motion of Mr. Balfour Paul, accorded a vote of thanks. Afterwards there was an exhibition of lantern pictures, illustrating examples of the Mediæval architecture of France and Britain.

TESSERÆ.

Sculptured Decoration.

ONE can learn a great deal from the Greeks on the subject of decoration, but not by slavish copying. If our work is to be to us as important an element as their sculptural decoration was to them, we must first of all study our own national conditions and needs. One essential difference between Greece and Britain is climate, and consequently light. Our sky is usually grey, and our atmosphere in towns, where important buildings are needed, is often heavily charged with smoke, especially in some of our large manufacturing districts. Therefore the distinctness that is the first essential of all work must be arrived at by different means to those employed in sunnier climes. The fineness of the line in the pediments of the Parthenon, clearly seen perhaps in Greece at a height of 40 feet, but that only by means of colour, could not be seen at all in our climate at the same altitude, unless under exceptional conditions of brightness. As a rule, our work has to be simpler, bigger and bolder, and if, when brought down from the height for which it was designed, it does not bear the close inspection as do the pedimental fragments now in the British Museum, this must be sacrificed for the right effects when seen from below, for this is the one thing requisite. A sculptor in the loving execution of his work is apt, if left alone, to somewhat ignore the required effect dependent upon the position for which the work is destined. Even in some of the Parthenon figures alluded to it is doubtful whether at the altitude of 40 feet, at which they were placed, much must not have been lost. Some of the sitting figures are so modelled that seen from below the knees would cut off the body up to the chest. The Roman work, though not certainly so delicate as the Greek, is considered to have been more designed for a set purpose, and this would be in keeping with the more practical nature of the people.

The Architect as Artist.

The architect is first and last a pictorial artist on a large scale. Indeed, none of the arts, except music and poetry, have the same chances of prolonged effect in design as architecture. The sculptor and painter nowadays are content with their brief but brilliant swallow flights, but the architect's art reveals him to us as the stimulator of men's imaginations by means of large effects extended over a large area. He is a picturesque manipulator of vast forms, he deals with proportional lines, outlines, contrasts, mouldings, masses, bulk, broad sunshine and

deep shade. He is a subtle harmonist of the contending motives of his structure; a colourist who employs colour-artifice in material or pigment, or gets it by glints of light upon delicate tracery and broken wall surface; to say nothing of his employment of the best colouring-matter of all—the essence of his own unique genius. In his capacity of pictorial artist on a large scale he not only uses his own best faculties, but the best faculties of others, much as the musical composer secures the best soloists and the best chorus he can get to form the orchestra that renders his oratorio. And he takes occasion by the hand in using to the best advantage every adventitious circumstance of site or material or natural resource. The best architects of the past have been men in whom the shaping faculty has been highly developed, and though their names may have perished, the loftier masters of design come before us in history as giant forces. The technical power and originality of their design, the beauty of their details, the range of their imaginative flight, all proclaim their work as the finest expression of human intelligence. "Many are the mighty things," says Sophocles, "and nought is more mighty than man." But it is a mistake to suppose that a building is bound to be adorned with sculpture to have imaginative expression. A building is capable of high interest and expression with no aid from sculpture and scarcely any ornament, yet whether severe and naked or never so richly adorned, it is from the architect that it gets its expression. Whether only the skilled mason and carpenter have helped him, or whether he have enlisted the highest instincts of the finest natures, his mind will have anticipated every stroke that is there—the depth of frieze for the painting or sculpture, the niche or pediment for the figure; architecture and decoration will have been sketched by him on his drawings; all will have been seen by the architect before ever the sculptor or painter is called in to exercise his genius.

Raphael's Cartoons.

The associations connected with the original destination of works of art often add to their interest, or at least explain their intention; and it must be admitted that the associations in this case are peculiarly important and striking; it is indeed but doing justice to the painter to be alive to them. The subject of the "Calling of Peter" was immediately next the altar in the Papal Chapel; whoever recollects in the cartoon the deep humility and devotion in the expression and attitude of Peter kneeling in the boat of Christ may now also call to mind that, at the distance of a few paces, the "Head of the Church" contemplated this scene from the highest of earthly thrones. These associations may be easily pursued by comparing the situation and import of the various subjects. The authority, the miraculous powers, the duties and the sacrifices of the Church, the propagation of the faith, persecution, martyrdom—such were the warning and inspiring themes which Raphael selected as objects of contemplation for "the successor of St. Peter." These associations and allusions would only be strikingly apparent when the works were in their original situations; yet among the merits or recommendations of the cartoons may be reckoned their being interesting in all places, and to all classes of Christians. But for this circumstance, perhaps, we should not now possess them, for when the treasures of art collected by Charles I. were sold, and such pictures as were deemed "superstitious" even ordered to be "forthwith burnt" (*Journal of the Commons*, July 23, 1645), the cartoons would hardly have been repurchased by Cromwell, to whom we are indebted for preserving them to the nation, if they could have been considered to come within the proscribed class. With regard to the execution of these works, it is known that Francisco Penni was Raphael's chief assistant. The co-operation of other scholars is also to be recognised, yet in almost all the cartoons the hand of the master is apparent, most perhaps in the "Calling of Peter" (the tapestry from which was to occupy so important a place), and least in the "Paul Preaching at Athens" and "Christ's Charge to Peter." As designs they are universally considered the finest inventions of Raphael. At the time he was commissioned to prepare them, the fame of Michel Angelo's ceiling, in the same chapel they were destined to adorn, was at its height; and Raphael, inspired with a noble emulation, his practice matured by the execution of several frescoes in the Vatican, treated these new subjects with an elevation of style not perhaps equalled in his former efforts. The highest qualities of these works are undoubtedly addressed to the mind, as vivid interpretations of the spirit and letter of Scripture; but, as examples of art, they are the most perfect expression of that general grandeur of treatment in form, composition and drapery which the Italian masters contemplated from the first, as suited to the purposes of religion and the size of the temples destined to receive such works. In the cartoons this greatness of style, not without a due regard to variety of character, pervades every figure, and is so striking in some of the Apostles as to place them on a level with the Prophets of Michel Angelo.

The Gnostics and Christian Arts.

The artistic tendencies of the early Christians were not entirely confined to the dim chambers of the Catacombs. Beyond the limits of the stricter society which adhered to the simple faith and practice of the apostles, there existed in the second century a numerous class of persons who united with profound veneration for the person of Christ, and strong admiration of his teachings, an equal attachment to the speculative doctrines of some pagan school and an unwillingness to renounce the fashionable tastes and pursuits of their time. These were the philosophical believers—Gnostics, as they were then called—whose influence, shading off the abrupt line of separation between pure Christianity and gross heathenism, was far wider and deeper and left more lasting traces on the Church than has been yet perhaps sufficiently acknowledged. These men imported from the lecture-rooms of the popular sophists a great love of art, and especially the reigning passion for collecting the likenesses of eminent sages and philosophers, which admiring students hung up in their chambers and sometimes had embossed on their cups and their seal-rings. Hence, it has been remarked by Heyne, among the remains of ancient art we have so many busts of the chiefs and founders of different philosophical schools. It is not surprising, in the wide prevalence of the syncretistic spirit, that the head of Christ should find a place among those of Orpheus, Homer and Pythagoras. Every one who has read the history of the second century is aware that the Emperor Alexander Severus set up the busts of these eminent personages in his Lararium or private chapel, where he duly offered them mystic rites. The Carpocratians are the first Gnostic sect who are mentioned as having busts or portraits of Christ, which they pretended were derived from an original once possessed by Pilate. The authenticity of the other likenesses associated with it probably rested on no better foundation. Augustine speaks of one Marcellina, a follower of the Carpocratians and a great collector of the images of distinguished men, heathen and Jewish, to whom he ascribes the general introduction of them among Christians.

Mediæval Treatises on Art.

Muratori in his great work on the Middle Ages in Italy has printed a very curious manuscript of the eighth century, the recipes in which give a tolerable picture of the nature of art manufacture among the Greeks at that epoch. It treats principally of the production of glass and contains directions for dyeing skins and making many colours, varnishes, &c. The next manuscript in order of time which has come down to our days is that of Eraclius, "De Artibus Romanorum," written probably previous to the year 1000, and particularly interesting is exhibiting some Byzantine characteristics, mingling with the ghosts of the old arts of the Romans still haunting the site of their old labours and glories. This treatise first proves the existence of the art of mixing colours with oil and of the preparation of canvases, skins or panels, with colours ground in linseed oil for the purpose of the reception of paintings, which were afterwards to be executed in colours ground in the same oil. As the mantle shrank away from the shoulders of the Greeks, it was transferred to those of the Arabs and Saracens, and from the ninth century to the thirteenth their learning in the details of decorative processes in chemistry, geometry and the arts of design generally was perhaps superior to that of any other nation in Europe. It is not, however, to be inferred that because Byzantium and the Mohammedan school bore away the palm, that Italy and the northern countries had been altogether indolent. The arts of ivory-carving, glass-painting and enamelling were introduced at a very early period into France; Ireland and England were celebrated in the seventh and eighth centuries for their goldsmith's work and illuminated books, the former of the two having been then perhaps more venerated and respected than it has ever been since. With the dawning of the eleventh century new life seemed breathed into the world of European art. At that epoch such men as Dunstan, Aldred and Lanfranc in England, Robert in France and Hildebrand at Rome, were encouraging the arts and raising and decorating churches which the reverence for relics caused to be ornamented by sumptuous shrines and costly gates of bronze or silver. The manuscript of Theophilus is the authority for the state of the arts about that time. Who this artist-monk was no one knows, and considerable differences have arisen even among the most learned as to his nationality and the period at which he wrote. Lessing, Leist, Raspe and Emeric David have ascribed to the treatise as early a date as the tenth century; while Guichard, Didron and the Abbé Texier have fixed the twelfth or thirteenth century as the epoch at which he flourished. The work of Theophilus contains a summary of almost all the knowledge of Europe pertaining to the arts of design as far probably as the year 1200. The first book contains in forty "capitula" as many recipes for the preparation and execution of all things necessary for painting in oil, fresco and distemper on wood, tin, mortar and parchment, including the preparation of the colours, varnishes, &c. The second book furnishes us with thirty-one "capitula," giving full and working directions

for the manufacture of white and coloured glasses into cups, vases, windows, &c., and it details the art of painting with enamel colours on glass most elaborately, including the formation of the gold-grounded mosaic, which formed so important an embellishment of all the Italian designs of the period. The third and last division of the *Schedula* introduces us to the whole art of working the precious metals and forming them into all the vessels fit and proper for the service of the church; it treats partially also of the manufacture of iron and gives particulars for the execution of ornaments in niello and enamel; it gives full instructions for the construction of the organ, bells and musical cymbals.

The Lagunes and Venetian Prosperity.

Venice owed the commencement of her prosperity, it may be said her very existence, to the preparation of salt in the surrounding Lagunes, and which her situation at the mouths of the Po, the Brenta and the Adige, enabled her to supply to Milan, Ferrara and the whole of North Italy. In process of time the Venetians seized upon the salt works of their neighbours. Thus the works of Cervia belonged to the city of Bologna, but by a treaty the whole of the salt made there was monopolised by the Venetians, who regulated the quantity to be produced, and even had officers for that purpose upon the spot. In the thirteenth and fourteenth centuries they either possessed or farmed all the salt works on both sides of the Adriatic, at Trapani in Sicily, in the Ionian Islands, Greece, the Levant and the coasts of Africa, and were the sole importers of the salt of the Black Sea and of the Caspian, and even of that collected in the Asiatic steppes. They also succeeded in obtaining the privilege of carrying all the rock salt raised in South Germany, Croatia, Styria, &c., and once forced a king of Hungary to shut up his salt mines. The maritime and fluvial populations of the Adriatic were deprived of the right to export their salt, and those of the north of Italy to use any other; in a word, five-sixths of all the trade in salt of the southern half of Europe was in the hands of the Venetians, whilst that of Northern Europe was monopolised by princes and feudal barons, who charged the most exorbitant price for it—an objection which did not certainly apply to the Venetians, who sold excellent salt at a very moderate price. The sale of foreign salt by any subject of the Republic was punished as a crime against the State; his house was razed, and himself condemned to perpetual banishment. But the Venetian salt monopoly did not end there, for the commerce was carried on by companies, each of which had the privilege of supplying a particular country or district, and none other. We believe it may be asserted with truth that, for fourteen centuries, one-half of the wealth which flowed into that remarkable city was derived from salt.

Concrete.

The discovery of the use of concrete is curious. In excavating for one of the piers of Waterloo Bridge the workmen had a good deal of difficulty, owing to the very compact state of the gravel forming the bed of the river, which everywhere else they had found perfectly loose. This effect had been produced by the accidental sinking of a barge-load of lime over that spot some time before, which had cemented the loose gravel into a solid mass, resembling the calcareous conglomerates of nature which are gradually formed by a similar process. Mr. Rennie having mentioned this circumstance to Sir Robert (then Mr.) Smirke, the latter with great judgment availed himself of the hint and subsequently used it in all his foundations, none of which have ever been known to fail. Part of the Penitentiary at Millbank, begun by another architect in a different manner before Sir Robert Smirke was employed there, was evidently giving way. The superior efficiency of concrete was also proved in a remarkable manner at the new Custom House, where the floor of the large apartment called the Long Room actually fell in and the whole building was in danger, owing to the insufficient manner in which the piling had been originally executed in a very difficult situation. At this period Sir Robert Smirke was consulted, who found it necessary to pull down a small part of the building, but saved the rest of it by undersetting all the walls with concrete, to the average width of 12 feet and to the depth of from 12 feet to 15 feet—that is, until he found a natural bed of gravel, including one course of Yorkshire landing stones and twelve courses of bricks laid in cement, having three offsets or footings between the Yorkshire landings, resting on the concrete and the base of the original walls. No other expedient could possibly have saved this fine edifice from entire demolition. It must be allowed that not only the ancient Romans and after them the Moors, but even the Norman barons of England in their feudal castles used concrete, of which Kendal Castle is one of the most striking examples; and more recently Belidor, in his "Architecture Hydraulique," treats of Béton mortar, which is much the same; so that is not absolutely new. In fact, according to the old proverb there is scarcely anything new under the sun; but the merit of introducing this immense improvement systematically and generally into the modern practice of architecture is undoubtedly due to Sir Robert Smirke.

NOTES AND COMMENTS.

PEOPLE have so long believed that mechanical engineering could be taught only in workshops, it is no wonder there are so few books on the subject. The creation of technical schools has therefore made it necessary that students of practical mechanics should possess manuals in order to be on an equality with students in other departments. The "Text-book of Mechanical Engineering," by Mr. W. T. LINEHAM, of the Goldsmiths' Company's Institute (CHAPMAN & HALL, Limited), exemplifies an effort to make up a deficiency which every day becomes more apparent. It is just such a book as a manager of engineering works would produce, and the moderate price will enable humble apprentices to possess it without sacrifice. It begins with workshop practice rather than with theories of dynamics, and the processes of casting and moulding, pattern-making, smithing and forging, fitting, erecting, &c., are described at length. The second part treats of the principles of machinery. The explanations are clear and exhaustive, and as there are over 700 thoroughly practical illustrations the student must be dense who is unable to comprehend what is said in the pages. The author evidently writes from experience, and he has been enabled to introduce drawings of the latest types of tools and machines belonging to firms of repute. Students who are occupied with building construction will find in the volume information about works in cast-iron and wrought-iron which will be useful to them, and for architects who have sometimes to prepare buildings for machinery it will also be of service. Like all good books, the manual does not appeal to a single class of readers, and it cannot be too widely circulated.

EVERY visitor to Rome is ready to testify that there is marble enough in the buildings to justify the claim which was set up on behalf of AUGUSTUS by his friends. But even students of geology are not acquainted with the varieties which are to be found in the city. To add to the general knowledge on the subject is the object of the handy "History and description of all ancient columns and surface marbles still existing in Rome, with a list of the buildings in which they are found," by the Rev. H. W. PULLEN, M.A., which we hope is the forerunner of many special guides with JOHN MURRAY on the title-page. The labour which the little book needed will be manifest to everyone who has tried to scrutinise the shafts and slabs. The character of the marble is not perceptible at a glance, and it is no wonder that the guide books are so often at variance on the subject. A visitor to Rome with the assistance of Mr. PULLEN'S book can either begin with a consideration of the marbles and goes in quest of them in the places pointed out, or if he prefers to make his itinerary in the way that will be most convenient he will be informed about the marbles in all the buildings he visits. It is only when we are acquainted with the character of the marbles that we can realise the enormous expense which was undergone in conveying many of them from remote regions to embellish Rome. And yet "no one single book on the subject exists in England, and it is just half a century since any such work was published in Italian." Mr. PULLEN'S handbook will enable tourists to find additional interest in the Eternal City.

THE following recommendations of a special committee on the conduct of competitions have been approved at the Convention of the American Institute of Architects:—
 "1. Architects of reputation and experience will not enter competitions unless they are paid for their services. 2. No architect should accept an invitation to enter a competition unless it is distinctly agreed in advance that the author of the best design shall be employed to erect the building, and that he shall be paid for his services at the rates established by the schedule of charges of the profession published by the American Institute of Architects. 3. It is the belief of your committee that the best ends will always be secured by the selection of an architect without a competition, for a better judgment may be formed of the probable result from the past work of an architect than from preliminary studies made in competition. 4. If impossible to appoint an architect directly, and a competition is necessary, we respectfully advise that in making the award it is best to select the man who by his competition

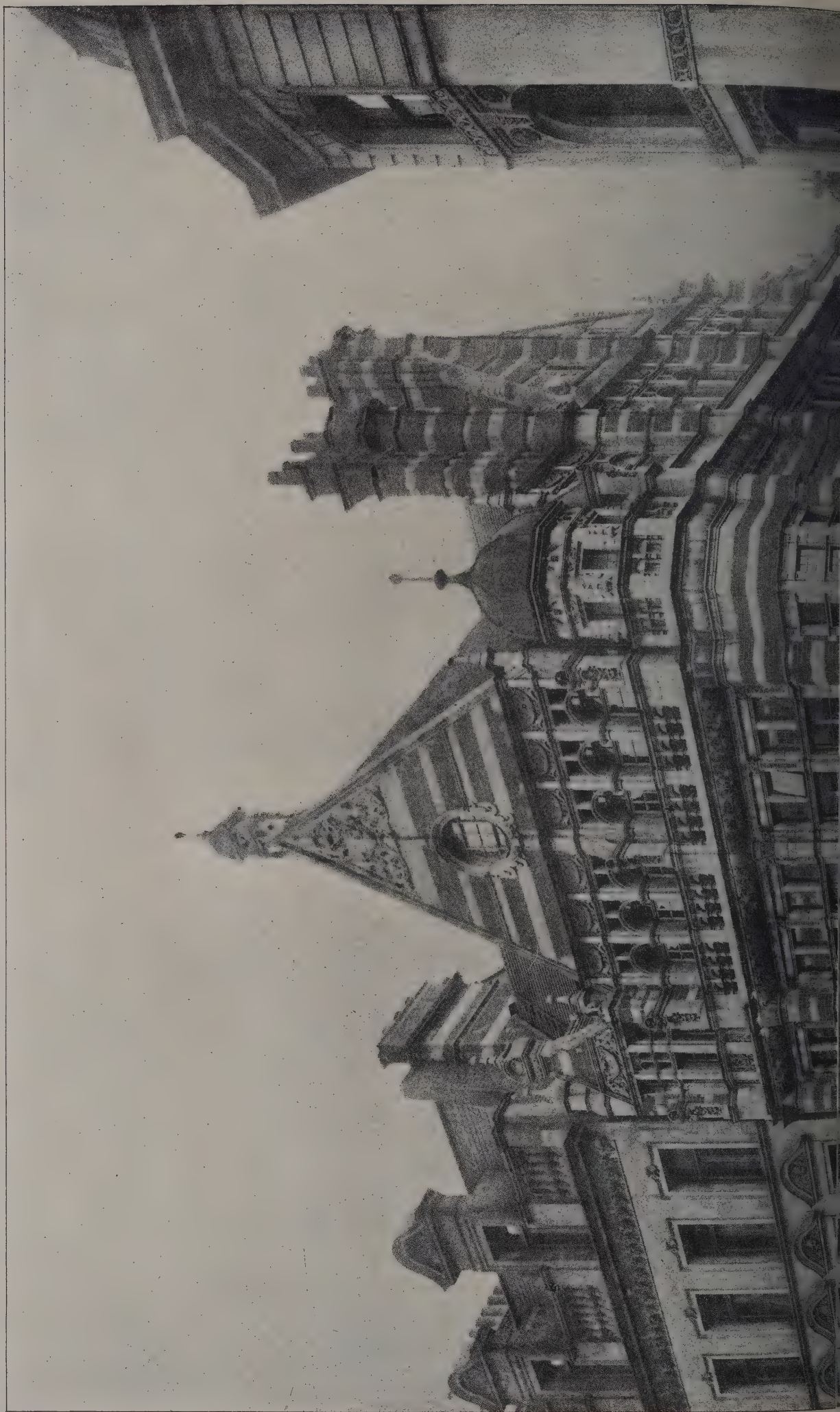
design has given promise of ability to develop his studies into the best solution of the problem, rather than the man who has guessed nearest to the preconceived solution of the problem of the party instituting the competition (thus eliminating as much as possible all elements of chance). 5. It should be clearly understood that a competition can only serve to furnish the general scheme for the arrangement and design, and that much after-study will be necessary to perfect details both of plan, elevations and sections. 6. The number and scale of the drawings required should under all circumstances, be definitely stated, and for any variation from the stipulations the author of the design should be thrown out of the competition. As few drawings as possible should be required, and they should consist only of floor plans, sections and elevations, the latter with carefully constructed shadows. The openings and shadows to be rendered in line, monotone or colour, at the discretion of the competitor, for to the competent expert the plan well studied from an artistic point of view embodies the perspective. The latter tends to discourage serious study, to deceive the jury and to entail a more than useless expense upon the architect, and should be excluded from competitions. 7. Inasmuch as a special technical education is necessary to judge from drawings of the effect in execution of an architectural design, it is indispensable that the party proposing to institute an architectural competition should appoint a professional adviser of standing and experience. 8. It should be the duty of the professional adviser to assist the party proposing to build to prepare a definite and explicit schedule of requirements and to state the exact limit of cost. To fix a definite time and place for the receipt of designs. 9. In the case of competition for work of magnitude, it is recommended that the plan formerly proposed by the Western Association of Architects should be adopted, viz. that a jury of award of three experts should be formed, to consist of the professional adviser of the committee, an architect nominated by the competitors, and a third architect appointed by the two thus selected. 10. It should be the duty of the professional adviser (if no jury is appointed) or of the jury to examine all plans and to place out of competition, by returning his drawings without compensation, any architect who has sent plans not corresponding exactly in number, quality or character with those required by the scheme of competition, or who submits directly or indirectly plans, sketches or models not called for by the scheme of competition. 11. The adviser or jury should study the plans carefully, and should definitely recommend one scheme as giving promise of the best result, and should recommend the appointment of its author as architect for the proposed work."

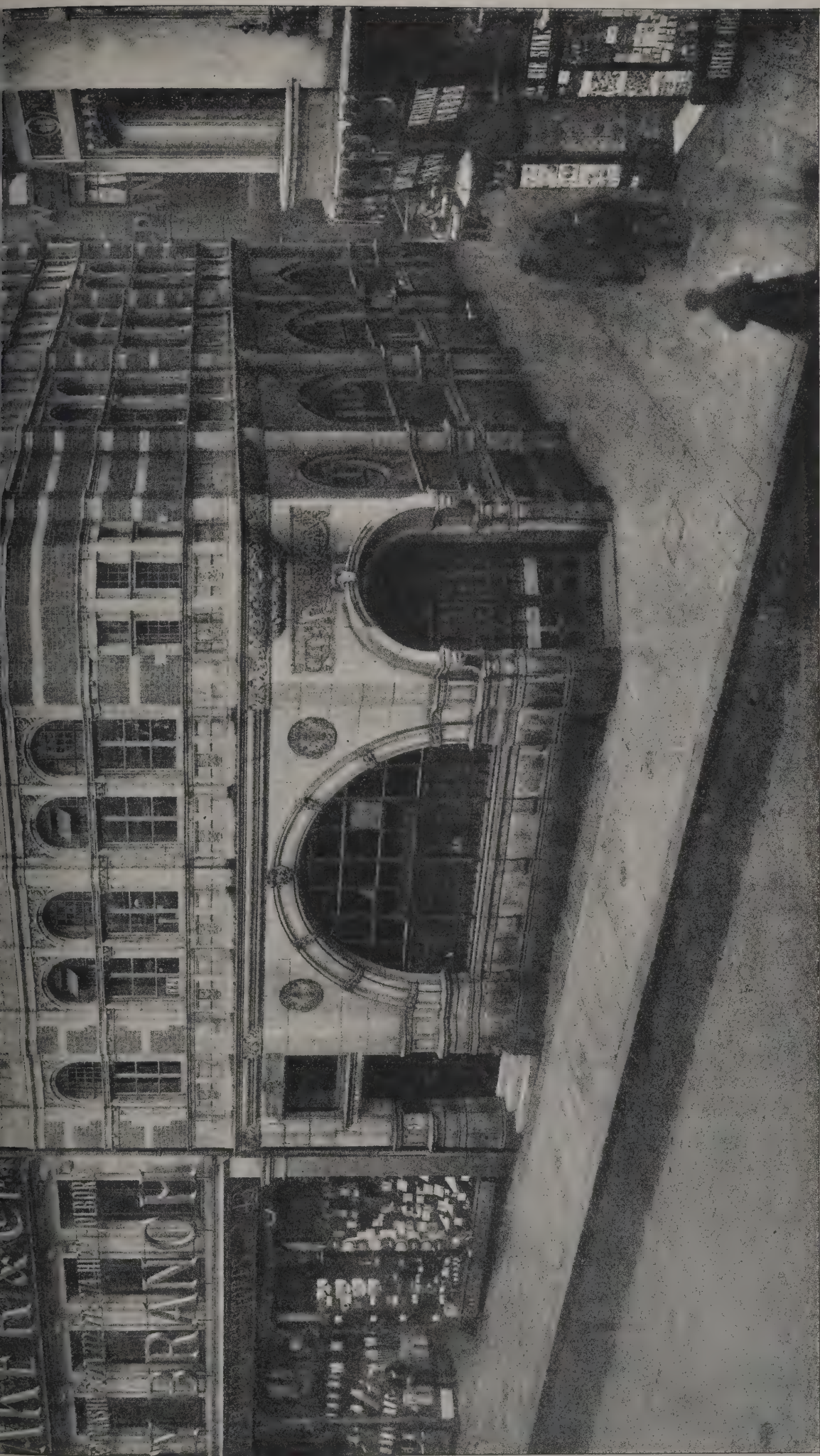
IT is not surprising that in France the high officials under the Republic should be dissatisfied with the arrangements of their predecessors of the Empire. An opportunity for an expression of that sort was given by the inauguration of the bust of FELIX DUBAN in the Ecole des Beaux-Arts. The architect was about 1849 entrusted with the charge of the Louvre and he carried out some restorations of the buildings. In 1853 he submitted plans for the completion of the palace and the uniting of it with FONTAINE and PERCIER'S work, by which the Louvre and Tuileries would become one great group. As a design by VISCONTI was preferred DUBAN resigned his office. VISCONTI died before the year had elapsed, and the carrying out of his design was entrusted to LEFUEL. At the inauguration of DUBAN'S bust M. JULES COMTE, "directeur des bâtiments civils," was one of the orators. He referred to the resignation of DUBAN as one of those melancholy souvenirs which everybody would like to forget. A Government which could not respect the liberty of an artist was to be pitied, as well as the officials who had the pretension to command a master whose superiority they ought to have revered. The Minister of that time who was incapable to appreciate DUBAN was forgotten, while the architect's name was renowned. French officials are remarkable for the elasticity of their taste, and the question may without offence be asked whether M. JULES COMTE, if he held office in 1853, would not have discovered that by a remarkable coincidence his judgment corresponded with the Emperor's in perceiving the superiority of the Italian's project?





H. W. ...



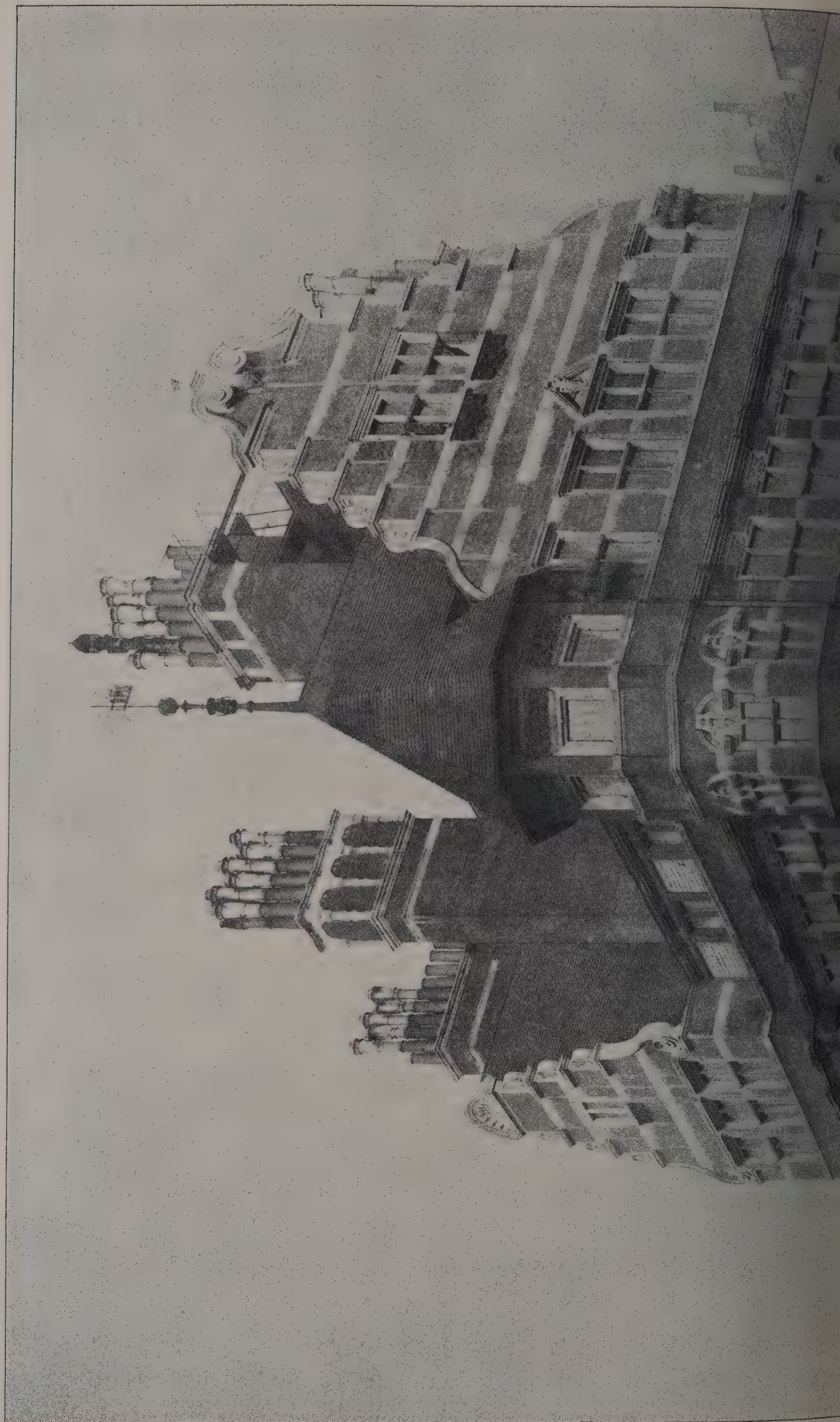


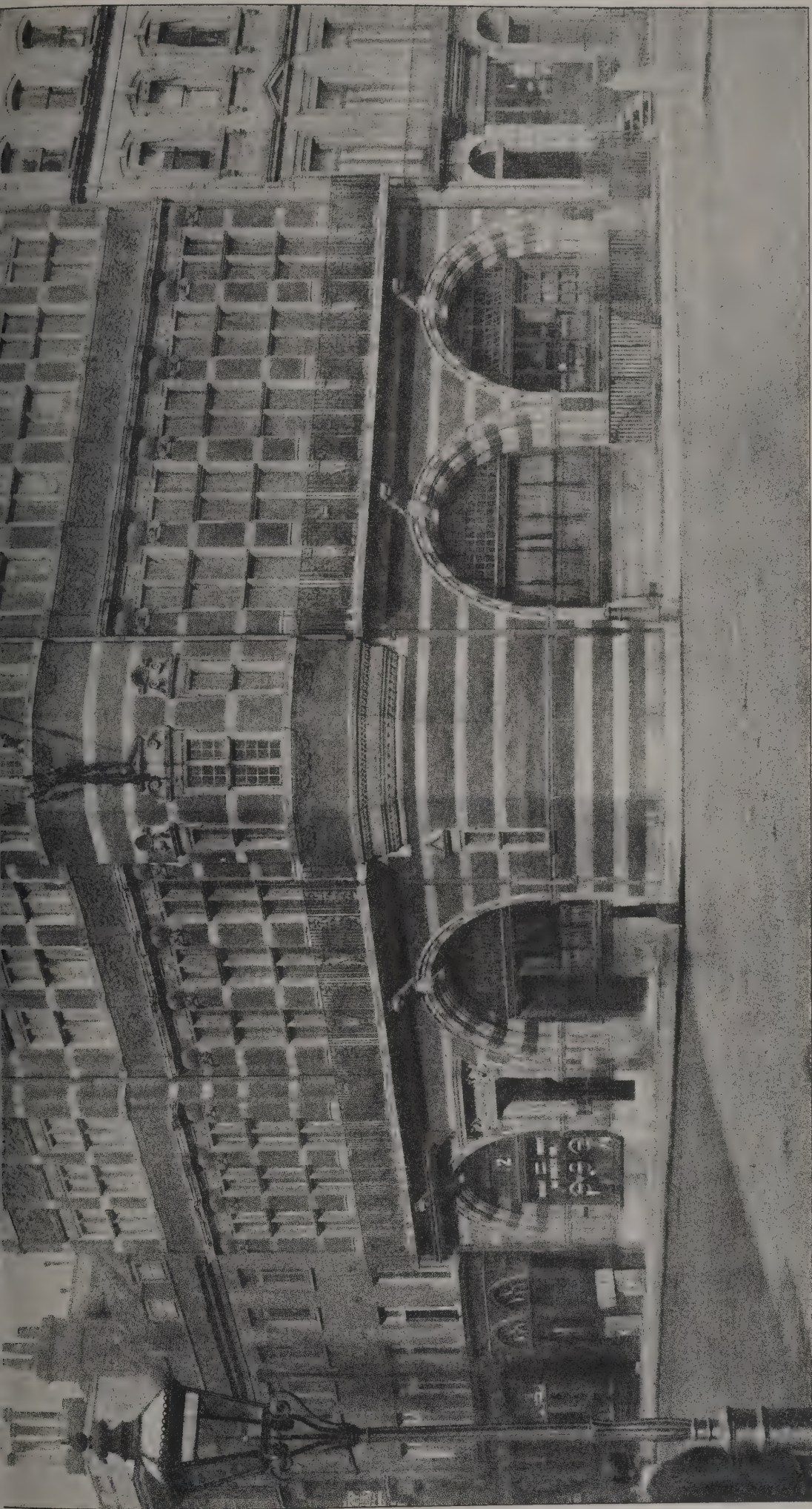
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PHOTOGRAPHED BY BEDFORD LEMERE & CO.

CITY BANK, LUDGATE HILL.
T. E. COLLCUTT, Architect.

Die Architektur. Nov. 23^{re} 1894.





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ALLIANCE ASSURANCE OFFICES, PALL MALL.
R. NORMAN SHAW, R.A., Architect.

ILLUSTRATIONS.

THE EDUCATION OF BACCHUS.

CITY BANK, LUDGATE HILL.

ALLIANCE ASSURANCE OFFICES, Pall Mall.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening. Mr. A. Graham, in the absence of the president, Mr. Penrose, took the chair.

Notes on the Architecture of China.

A paper on this subject by Mr. Gratton, then *en route* for China, was read by Mr. Kidner, who, from his knowledge of China, was able to interpolate interesting and explanatory remarks. It has been often said that China had no architecture, as so few examples of what had existed now remained. Much that had been written about Japan would apply to China, descriptions of feasts and festivals, ceremonies, &c., and casual references to temples. Quaintness and adaptability were the chief charm of architecture in China. Their decorative productions, including carving and sculpture, could hardly be surpassed. Temples of various descriptions abounded everywhere; they were an instance that the minds of the Chinese were saturated with faith with a decided bent towards worship. The amount of money spent for religious buildings and purposes was second to no other country or empire. Their prayers were addressed to an unseen Deity. Side by side with their temples those responsible for imported creeds had erected their places of worship, but the temples erected by these various sectarians could not be called types of national architecture. The Chinese temples were some of them erected in honour of the unseen spirits above, while many were consecrated to agricultural and industrial pursuits. The inability of China to point to architectural remains was accounted for by their destruction by the Moguls, the English, and finally to earthquakes. In the invasion by the Moguls over 100 cities were destroyed. Palaces and temples were destroyed by the English, which work of destruction was helped on by later disturbances. Afterwards no less than 300,000 persons lost their lives by the earthquakes, and, in a similar visitation a few years later, 180,000 persons perished. Among other cities that of Hangchow was alluded to. In the ninth century the city was extended, and 200,000 workmen were engaged on the work and repair of the walls. Timber, owing to the forests, had, and still formed a very general building material. The subject of timber construction, from simple to the most elaborately ornamental forms, would be quite worthy of discussion if time would have allowed them to indulge in it. A geometrical figure to symbolise male and female was described, which had apparently influenced the forms of arches. It was symbolic; but in regard of bridges it involved a considerable height, and necessitated often approaches formed by steps. The Great Wall, winding over hills and mountains for some 1,500 miles, was alluded to, with its square towers, at intervals, some of them two storeys in height. The cities were of four classes. Over 1,000 had embrasured walls, and were frequently flanked with towers. Some have simpler kinds of walling; some had earth or mud walls; others were moated, and had water-gates at the main entrance. The walls of Pekin and two other cities were described as 50 feet high and 40 feet wide; also the concentric walls of Nankin and Canton and Shanghai. Another feature in connection with the cities was the amount of land enclosed within the walls. Whether the large amount of unoccupied space was provided for probable increase of population, or for agricultural purposes for provision of food, or for military purposes, Mr. Gratton did not know. Many of the Taeping cities, with their temples, were now only heaps of ruins; other temples, so-called, were places of business or pleasure resorts. Generally they consisted of three halls, entered one from the other, the third being the largest of all. The most magnificent temples were those in the imperial cities. The roof construction and timber work of these temples was curious. Among the altars was found an altar to the Queen of Heaven. The tilework, the decorations, the stone carvings, including representations of birds, beasts and men, were often marvels of beauty. The celebrated hall of ten thousand ages, once an imperial temple, still retained colour decoration. Bells came in for notice. One 17 feet high, 15 feet in diameter, having 4 inches thickness of metal. A larger one weighed 50,000 lbs., the thickness of metal being 7 inches. The boom of these large bells was some-

thing to be remembered. The writer spoke of images in contradistinction to idols. He had seen no idolatry. In the Buddhist temples there were images innumerable, but in case of fire the images were left to burn, while the costly tables they were placed on were rescued. Of palaces few remained, they had either been looted or destroyed by fire. Pekin Palace was a gem of art, covering an immense area. The hall was 125 feet long and nearly 50 feet wide, the ornamentation most elaborate, and furniture and fittings of the most luxurious kind up to the highest ideal that an eastern mind could conceive. The many charitable institutions for the poor and for orphans, asylums, schools, &c., were referred to, the keeping up of which represented large sums of money from voluntary sources in addition to State aid. Guilds also existed on practical lines, as they used to do in this country. The guilds, however, differed in being amalgamated, all handicrafts of a like kind in one, while those craftsmen who had strayed from their native towns, if strong enough in numbers, formed a separate guild and erected halls for their own use. Allusion was made to the pagodas, towers, pavilions and summer-houses, and some objectionable matters in regard of Chinese infanticide referred to. Canals and rivers form some of the principal highways in China, and the bridges, they were legion. The marble bridge near Pekin had seventeen arches and a handsome marble balustrade. The bridges included also drawbridges and suspension bridges. Generalising, the writer intimated that comfort was unknown in China. If there were fires it was only for purposes of cooking. Chimneys were the exception, and as a rule the fumes of wood or charcoal must escape as best they could. Winter, however, was short, so the absence of fires was not so much felt. In addition, the houses were usually fronted towards the sun, the other three sides of the house being well closed up. The heavy clothing worn by the Chinese was a preservative. They wore clothing layer upon layer till they could not get their arms to their sides. As to windows, glass they scarcely employed it—oiled paper was more usual. Laminæ of oyster shells produced a somewhat subdued but beautiful effect in the way of light. Though a national style might not be now distinctly apparent, what remained showed a beauty in wood, stone and metal work, to which was added a beauty of design in details, mouldings, forms, &c., with also a distinct style in colour decoration, and this was further distinguished by curious neutral but beautiful tints.

Mr. GEORGE AITCHISON, A.R.A., said that, though he knew absolutely nothing about China, he rose to propose a vote of thanks for the paper. He certainly envied Mr. Kidner his opportunities of seeing the beautiful colour decoration in China.

Sir HENRY HOWORTH expressed the interest with which he had listened to descriptions of districts so long familiar to him. He had only lately said, while presiding over a meeting of the Archaeological Institute, that something could often be learnt from what they might call uncounted buildings. Bamboo architecture in tropical regions was very suitable; deep shade and plenty of draught was obtained, and white ants would have nothing to do with bamboo. Architecture in its changes was influenced by contact with other civilisations, and the East had not failed to take inspiration from the West. He also instanced how the Chinese had valued the superior knowledge in astronomical science, imparted to them by the Jesuit Fathers. He traced the introduction of the manufacture of the beautiful coloured porcelain in China to the Persians. The Chinese, with their wonderful aptitude, had at once set out to work out the capabilities set before them. He was quite of opinion that Chinese art had come from the West, and in their pagodas the construction was exactly Babylonian.

Mr. R. PHENÉ SPIERS said he had been struck with the resemblance of the Chinese work to Chaldean and Babylonian architecture. The area of the city of Babylon was so immense that it was natural to imagine much land had been reserved for agricultural purposes in case of siege. He doubted whether the Chinese could claim to have a style, properly so-called. Their architecture showed no knowledge of furnishing capitals for their columns. In constructing arches they had followed the Babylonians.

Mr. ASHBEE said that the marvellous architecture of China—a most remarkable country—would admit of much explanation that they probably had not time that evening to enter on. Speaking of Pekin, he said it contained four cities; the inner contained the imperial palace and gardens, the second the villas of the nobility, a third zone was devoted to the military, and the fourth and outer zone made the Chinese city.

A hearty vote of thanks was passed for the paper and the proceedings terminated.

Mr. Riley, of Halifax, has been appointed surveyor by the Gainsborough Local Board, a post vacated by Mr. MacDonald, who has received an appointment at Rugby. There were 133 applicants.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE opening meeting of the Northern Architectural Association was held on the 14th inst., when an address was delivered by the president, Mr. Joseph Oswald. Among the local topics treated were the following:—

The architectural aspect of our city must always be a matter of prime concern to us, and so I cannot refrain from referring to a matter which my predecessor touched upon last year. I mean the way in which our streets and buildings are defaced by advertisements, enormous letters and signs attached to or surrounding the façades of our buildings, with entire disregard to their structural lines. To my mind, nothing more vulgar can be conceived than the mania for advertising running riot in such shapes. They are a standing menace, too, to public safety, for, in course of time, the probable neglect of these features, accompanied by inevitable corrosion and decay, may result in serious accidents. I am far from advocating too much interference by public authorities with the liberty of the subject, or with the ownership of private property, but I do think these authorities occasionally strain at gnats and swallow camels in a remarkably inconsistent way. Not only in towns is this disfacement going on, but the traveller by rail or road must needs have his sensibilities shocked by "execrable shapes" which rear their "miscreated fronts athwart his way." I allude to the boards stuck up by the advertising fiend in quiet country lanes and fields, extolling the merits of this, that, and the other condiment, medicine, or substance obtained by the action of caustic alkalies upon fats. Cleanliness may be next to godliness. Soap is, no doubt, an important factor towards that result; but if its use has to be secured at the expense of our landscapes, so much the worse for our age and generation. And not only by day are these things forced upon us, but even when night has fallen our buildings, no matter how sacred or stately, are threatened by a new development of the craze. By means of limelights and lenses, the praises of anybody's manufactures can be projected across the dome of St. Paul's, and I believe actually have been upon the buildings surrounding Trafalgar Square.

As architects, we might do something to curb the use of objectionable signs, by providing upon our elevations panels or spaces where letters and the like can be inserted or attached. The architect too often overlooks the fact that such things are necessary, and in their proper place legitimate; and if he covers every superficial foot of his building, that is not plate-glass, with architectural detail, he tempts the owner or tenant (as a rule, a modern Gallio who cares for none of these things) to eclipse the mouldings and the carving however refined with things never contemplated by the architect's academic rules. This leads me on to a word or two upon restraint in design.

Axwell Park is not a very remarkable building (its architect was Mr. Payne, of London, who enjoyed a considerable practice in the North of England, for he also designed Belford, North Gosforth and Bywell Halls), but it exemplifies what I call restraint. "It stands four-square to all the winds that blow," and possesses dignity due to simplicity of form, which we lose if we fritter away our resources on small scale details, or by constructing picturesqueness. Such faults are not confined to one city or neighbourhood. It is general. Ever since the days when Barry overlaid his greatest work with an exuberance of surface ornament, it has been the fashion to follow in that track. Now, I am glad to see signs that the tide is setting in another direction, and that the value of plain wall surfaces is being more and more appreciated. The success of one work of the past few years is clearly due to this. "New Scotland Yard," on the Thames Embankment, by Mr. Norman Shaw, appears to me a brilliant example of genuine architectural effect, legitimately obtained. Of course, we in the provinces rarely have free scope. We can do little else than reflect the public taste of our respective localities. Lead it we may so far, but so far only, for if we get too much in front we lose our following.

Every owner, I presume, of every little twenty-foot frontage in a business street wants to make the most of it, something quite different from, and always taller (if he can manage it) than his neighbour on either side. So the architecture of our modern streets becomes a heterogeneous mixture of narrow vertical slices; whereas one has but to look at Grey Street, and the old part of Grainger Street, to see that horizontal combinations only can give real dignity to the whole. And yet, the streets I have named are free from monotony. If we go into the suburbs we will see row upon row of houses, as like to each other as peas in a pod.

I never saw a town of the size and wealth of Newcastle with so little beauty in its suburban streets. Of course architects are not to blame for this, or at any rate, very remotely. These houses are run up, half a dozen at a time, by speculators, who build to sell. But if we cannot practise we may, at any rate, preach. One of the great difficulties in securing a more lovely state of things lies in the system of back streets, which obtains in this city. Why should these be omnipresent or so un-

pleasantly obtrusive? In many towns you may look far to find them. Instead, you will see semi-detached villas, with gardens where our back streets would be. Each block being separate from its neighbours, there is scope for individual treatment architecturally, and sanitarily there is better circulation of air. The cost need not be greater, for although more frontage is called for, and more external walling, there is no back street to swallow up land, to pave, to flag, to sewer, to scavenge, to watch, to light. Let us hope that in some of the building estates about to be laid out in the neighbourhood an attempt will be made to get out of the groove into which we, in the north, have fallen, and to provide modest but attractive detached or semi-detached dwellings, not too large or expensive for the average family. Years ago (and from time to time since) correspondence on this subject took place in the local newspapers, but as yet its ventilation has brought no tangible result. A word, too, in condemnation of the dog-in-the-manger like way in which some people hem in their grounds and gardens by high walls, converting semi-rural roads or lanes into avenues of brick and stone, instead of verdure.

Newcastle is not rich in architectural interiors. A year or two ago we lost the Central Exchange, a very noble apartment. This year we have, to a large extent, lost the interior of the Central Station. Our first President's great work, with its subtle charm arising from the harmonious blending of curved plan with curved roof-lines, and the archivolts of its openings, has been irreparably marred as a work of art. There has been a gain in accommodation (and, therefore, possibly in convenience); but I confess that I cannot look without depression upon the low sheds that have been tacked on to the east end of the station, and upon some other features that have been introduced into it. Another railway work now nearly completed we may, on the other hand, be grateful for. I mean the Dean Street arch. "It might have been" a girder bridge; but, "greatly to its credit," the railway company has built a granite one, the curve of which, though not concentric with the older arch alongside (which was impossible), still harmonises with it, and one of the most striking "street-scapes" in Newcastle is thus preserved.

A short time ago the news came with a shock to most citizens that the lantern of the tower of our cathedral church of St. Nicholas was in a dangerous condition. Its restoration, under Sir Gilbert Scott, a quarter of a century ago, was deemed to be effectual for a much longer period than has actually proved to be the case. Our smoke and acid-laden atmosphere, combined with want of attention to ironwork and pointing, has brought about a state of things which all must deplore. It is to be hoped that no time will be lost in making this world-famed structure again sound and substantial beyond the risk of accident, and that no considerations of precedence or parsimony will restrain our City Fathers from doing what is necessary. No question of churchwardenship *versus* municipality should be allowed to arise now. The treasure the city possesses in this steeple is unique. It has been imitated, but never copied. Even the greatest English architect of the last 200 years, who rivalled Michel Angelo's dome, never raised aloft another lantern like ours. There is a tradition that Wren, when the centering was removed from his church of St. Dunstan in the East, watched the operation from London Bridge, apprehensive of the safety of that weak aftertype of the lantern which here, in Newcastle, has for centuries upreared its stately crown, and which we are bound to preserve for the admiration of the centuries that follow.

I well remember when, in 1867, the dome over the south-east corner of the Central Exchange was destroyed by fire, the owner, when rebuilding, proposed to omit it altogether. The importance of the dome to the *tout ensemble* of Grey Street was felt to be such that a public subscription was instituted by the late Alderman Dodds (chairman at that time of the town improvement committee) to defray the cost, and so the integrity of the design was preserved. How still more important to the architectural repute of the city is the tower of St. Nicholas?

It has been publicly announced that the Theatre Royal, one of the city's finest buildings, designed by Benjamin Green, the exterior after the Pantheon at Rome, is so far as the auditorium is concerned to be reconstructed within the next twelve months. Whether such internal reconstruction will be architecturally an improvement remains to be seen; but, so far as I know, it has not transpired to what extent, if any, the façade in Grey Street will be interfered with. I may, however, express the hope that the proprietors will regard themselves as trustees of a noble work of art, and, as such, guard it from any injury.

Another work of Green's has undergone internal reconstruction lately. I mean the library of the Literary and Philosophic Society. The ceiling, as Green left it, was a piece of good design, unpierced, cambered and coffered, and its removal a few years ago, when top light became a necessity, was a distinct loss; but this year much has been retrieved in carrying out the design of our past president, Mr. Rich.

It must be a matter of congratulation to all British architects and archaeologists, and to us in Northumberland especially, that the ownership of one of our most precious relics of antiquity, in changing hands this year, has become vested in a nobleman who is not only able to appreciate, but able and willing, substantially, to prove his appreciation of all that is beautiful and interesting in his latest acquisition. Lord Armstrong and his architect have before them a delightful task in enhancing the natural and artificial beauties of Bamburgh Castle, in the removal of what is base and unworthy of its age and grandeur, and the replacement of much that less erudite workers have, in their ignorance, destroyed.

The building trades in this district during the past year have been and promise to remain fairly brisk; perhaps because they have not for some time past been disturbed, like some other trades on Tyneside, by disastrous strikes. Long may they continue to be free from them. I was informed a few weeks ago that, in connection with one important branch, a Conciliation Board had lately been formed in this district and was working so far harmoniously. If such boards were generally established they would go far to allay the jealousies and distrust which lie at the root of all trades disputes; and if decisions arrived at by them were always loyally acquiesced in by those concerned we should be appreciably nearer the millennium.

The relationship between the local master-builders and our profession continues satisfactory; a pleasing contrast to the condition of affairs in one other important centre, where disputes appear to have arisen difficult of settlement, unless mutual respect, confidence and forbearance, such as obtain here, unite to smooth them over.

Closely bound up with trade organisation is the question of apprenticeship, the decadence of which system calls urgently for some remedy or substitute. Although we are not yet in this country so badly off in this respect as seems to be the case in the United States of America (owing to the control there of trade matters being practically in the hands of foreign immigrants), we are nevertheless in the unfortunate position of witnessing the gradual but inevitable extinction of the old style of things, where the relations between master and apprentice were pre-eminently personal. What is to take its place? Will the modern technical school be able to cope with the problem. I doubt it; but to attempt to deal with the situation and to review the whole subject of building trade organisation with its infinite ramifications would take a paper itself, nay, a series of papers, only to enter into, and I feel that I am getting far beyond the proper limits of an address such as this.

GLASGOW ARCHÆOLOGICAL SOCIETY.

THE thirty-eighth annual meeting of the members of the Glasgow Archæological Society was held on the 15th inst, under the presidency of Professor Ferguson.

The secretary, Mr. W. G. Black, submitted the annual report. This stated that the number of members admitted in 1893-94 was thirteen, and that the total membership, including honorary members, was now 342. Professor Ferguson moved the adoption of the report, Mr. John Honeyman seconded, and the motion was agreed to.

Professor Ferguson then delivered his retiring address. He said that when he came into office a year ago, he referred to the necessity not only of individual students, but even of societies, confining themselves to such topics of investigation as lay closest to their hands. For themselves, it was not requisite to go from home for material to examine. The field of research in Scotland alone was far from being exhausted. The country teemed with reminders of the forgotten past. It would be a work of much value, but of no small labour, to give a survey of all that had been done during the last two or three years to illustrate the antiquities of Scotland by individuals and the half-dozen or more of Scottish antiquarian societies. There had been a broadening of the subject for a little time. A danger to which all remains of antiquity were exposed was the ignorance of those who lived beside them. It was well that knowledge of the antiquities about us should be as widespread as possible. It was only by educating a universal public interest in the preservation of objects of antiquity that they could be protected from the selfishness of individuals and the iconoclasm of certain classes of people, railway companies and others. Let it once be understood thoroughly that a castle, hill, fort, or monument, although it might be claimed as property by an individual, yet as an antiquarian object belonged to the country at large, and a great deal would have been achieved. In Glasgow it would be well if the Archæological Society carefully watched alterations which might be suggested hereafter. There was hardly anything left of early Glasgow, and what little there was should now be jealously guarded. The most important archæological event of the year was the Old Glasgow exhibition. In every respect it was most valuable.

In the first place it brought to light an abundance of objects of all sorts which had outlasted their actual use, and were kept in existence as mementoes of their owners or reminders of different manners and conditions of life, or for the worth of the material of which they were fashioned. One was glad to think that so much had survived when the temptation was so great to discard old things to make way for new. One might try to hope, but he feared they could hardly believe, that the exhibition had sufficiently impressed the inhabitants of the city to make them take a greater interest in its past history and in the people who lived in it and helped to build it up. But if it had induced them to preserve anything, however trifling, which threw light on the history and manners of the past, the exhibition would not have been in vain. A great danger to objects of antiquity was their isolation, because it was only by comparison with other objects that their value could be ascertained. In his address last year he had alluded to the importance of establishing an archæological museum for Glasgow. The recent exhibition had come most unexpectedly to take up by direct illustration what he then said. It had shown that there was no lack of material as a nucleus for such a collection. He believed that many persons who had objects of curiosity and value would be pleased to have them safely housed and preserved in a regular Old Glasgow Museum. He hoped that it would be within the power of some one who occupied the presidential chair to do something to bring to a practical issue the design for a permanent Old Glasgow exhibition. In concluding he paid a sympathetic tribute to the memory of two members, Mr. Guthrie Smith and Professor Veitch, who had died during the year. He afterwards nominated Mr. C. D. Donald as the new president. This motion was unanimously accepted.

Mr. C. D. Donald then took the chair and delivered his opening address. He devoted his remarks to a consideration of the benefits of archæological research. In every one, he said, there was a spark of diviner fire which the ordinary pursuits of business life did not satisfy. A knowledge of the past and an interest in it the archæologist carried with him wherever he went. To him no journey could be dull or profitless, for everywhere there were to be found traces and remains of the past ages that showed to us the manner of men those were who lived and loved and fought and died in the far-off years. It was this human interest which gave life and glow to archæology. His advice to everyone who wanted a hobby was to choose archæology. Its study was excellent training for a man's observation, for his power of recognising a fact and its consequence, and for its judgment. He suggested as a suitable subject for archæological research the so-called Caledonian wall. It might lead to the settlement once and for all of the question whether it was a prehistoric rampart or a modern fence. He further suggested that a catalogue should be made of the various objects of antiquarian interest within a certain radius of Glasgow, say ten, fifteen, or twenty miles. If a combined effort were made such a catalogue would soon be under way. Other office-bearers were afterwards appointed, and the proceedings terminated.

EXHIBITION OF PHOTOGRAPHY.

THE executive council of the Imperial Institute have announced that a special exhibition of photography in its application to the arts, sciences and industries will be held at the Imperial Institute, in connection with the United Kingdom section, during the summer season of 1895. An influential committee of advice has been formed, composed of governors of the Imperial Institute and scientific men of well-known standing who are interested in photography; and sub-committees have been appointed in connection with the seven sections of the exhibition, viz.:

Division 1.—The history of photography, including illustrations of early processes, the progressive development of processes, the early processes of photo-mechanical work and modern photographic literature.

Division 2.—Artistic photography, comprising a thoroughly representative exhibition of all schools, embracing known as well as new works, and illustrations of the present condition of photographic art in the various colonies and in India.

Division 3.—Photography as an industry, demonstrating the apparatus used in photography and the special processes connected with the preparation of lenses, the production of brass fittings, cameras, &c., shown in actual operation; the preparation of dry plates, coating of sensitive media, printing processes, also shown in actual operation; reproduction of pictures and the production of portraits by daylight and artificial light.

Division 4.—Photography in its applications to industries, such as reproductions having photography as their basis, as applied to illustrated journalism, literature, &c., and industrial applications of photography to ornamentation.

Division 5.—Applications of photography to the sciences, including orthochromatics, optics, stereoscopy, photomicro-

graphy, spectroscopy, meteorology, and magnetism, astronomy, automatic recording apparatus, &c.

Division 6.—Applications of photography to educational purposes.

Division 7.—Miscellaneous applications of photography, including applications of photography to architecture and archæology, to engineering, to military and naval purposes, to legal purposes (such as the detection of forgeries), to surveying, cartography, chronography, &c.

Notification of the exhibition will shortly be transmitted to the principal firms engaged in the manufacture of apparatus connected with photography in the United Kingdom. The Governor-General of India, the Governor-General of the Dominion of Canada, and the Governors of the various colonies have, by a recent mail, been requested to invite Indian and colonial manufacturers to exhibit.

VANDALISM IN ENGLISH CHURCHES.

A CORRESPONDENT of the *Times*, under the signature of "Vacuus Viator," having lately complained about the difficulty of admission to country churches for the purposes of study, some letters in reply have been published. Mr. Albert Hartshorne writes:—

Does experience show that the people can be trusted in this respect? I instance the forlorn and denuded condition of the ancient memorials in Westminster Abbey generally, and the monument of Henry III. in particular—though for centuries under vigilant care—in absolute proof that it cannot. I say nothing of the missing or shattered artistic details in countless churches throughout the kingdom.

What said Sir Roger de Coverley in 1712, on being told that the silver head of Henry V. had been stolen from his effigy? "Some Whig, I'll warrant you; you ought to lock up your kings better; they will carry off the body too if you don't take care."

The late Sir Gilbert Scott tells a story, in his "Gleanings," how he once discovered in the Abbey some beautiful alabaster statuettes belonging to the tomb of Queen Philippa; these he fixed in their original positions with his own hands; on his next visit he found they had been stolen, and he figuratively suggests "the 'tanning' of the rascal's 'hide,'" somewhat after the Mediæval manner, as fitting punishment for the thief.

"Nay, let hym alone; he lieth lyke a nobyll Prince, I wolle not troble hym," said Henry VI., when he was choosing a site for his own grave near that of his father; but no such piety has troubled the people for centuries, and it is, unfortunately, no new British characteristic that works of art in churches should be stolen, disturbed, or destroyed.

The brasses in Cobham Church, of which "Vacuus Viator" (the correspondent) could not get a sight on a Sunday afternoon, form the finest series in England, and, together with the armets and helmets over the tombs, are worthy subjects for the special care that is and must be taken of them from day to day. It will probably be urged that behaviour is improving, and that a proper sign of our confidence in the people would be to leave the churches constantly open. Such was, indeed, the feeling with regard to one of the finest old churches in North Northamptonshire. I give this as a typical case. Four days ago the rector wrote to tell me that four beautifully-carved little wooden figures decorating the lectern were stolen last week. Such a thing would probably have been impossible in Italy, and would not have happened in this Northamptonshire church if the doors had been locked, as they now probably will be in future. It was found impossible to keep open during the week the great church of a small town near here because workmen and market people retired within its portals, not to pray, or to steal, or to do damage, but to eat their dinner. Again, such would not have been the case in Italy. The ancient church here (Ashbourne) is safely open both day and night, having been "restored" with unusual thoroughness about forty years ago.

It is to be hoped that custodians of cathedrals and churches will continue to take the measures which experience has shown them to be necessary in order to resist the shocking British habit of damaging or carrying off the works of the great artistic ages which have passed away; measures, indeed, which are clearly necessary to save what, after all, is now but a remnant. It may be that a better spirit may arise among the masses. In the meantime it seems to be the melancholy truth that the few must continue to suffer inconvenience or exclusion on account of the wantonness of the many, if remains of ancient art are to be preserved at all in English churches.

The Rev. F. T. Bramston, vicar of Wootton Wawen, says:—Such a visitor as "Vacuus Viator" to any church would, of course, enjoy from any clergyman more than a welcome. It must be the exception rather than the rule that he meets with now and then an obstacle in the path of his instructive and interesting studies. But he will agree that some care and that some rules are required. The whole sanctuary might be open day and night if all were as "Vacuus Viator." Even in this

remote place a party came on an occasion and had a picnic in the church, leaving one of the party, a woman, intoxicated, and traces are easily recognised about this old church of the spoiler's hand—monuments defaced with names which are witnesses to their owners' disgrace and otherwise injured. I determined on coming here to keep the church closed, and to make the charge of 6*d.* for each person wishing to see the church at any other time than when it is open for Divine service. The amount charged goes towards the church and is entered regularly in a book; all this is done with the approbation of the two churchwardens.

Another correspondent writes:—I sympathise with "Vacuus Viator" in his various disappointments. Like him, I take a deep interest in Ecclesiastical architecture, and I have long practised his intelligent method of travelling—a method by which I have managed to see nearly all the great churches in England. But I do not sympathise with his random denunciation of deans and chapters and "casual parsons," and I think his grievance is not with them, but with that great number of the British public which renders necessary the existence of these "arbitrary restrictions."

Unfortunately there does exist, I had almost said a majority of people whose unrestricted admission into churches and cathedrals would be followed by the gravest evils. It was not long ago that an English clergyman (and I will willingly allow "Vacuus Viator" to call him a "casual parson" or anything he likes) was convicted of chipping a piece off a piscina in Westminster Abbey which he desired as a memento. And how many there are who, if not "personally conducted round Canterbury Cathedral," would scratch their names on the nose of an alabaster effigy or anywhere else that offered a good surface. And the spoliation by which matrices alone remain of the finest brasses throughout the country took place "before deans and chapters introduced their so-called reforms and charged 6*d.* a head."

But I do not believe that deans and chapters and casual parsons ever desire their restrictions to exclude any one who really takes a deep interest in architecture. I have never been refused permission to have access at any reasonable time to a church in order to take brass rubbings. I have found the Dean of Canterbury, to take "Vacuus Viator's" own instance, most ready to give permission to a total stranger to dispense with "personal conduct" in the cathedral.

Lastly, I cannot agree with his admiration of the French system of State control. The place where I saw it most elaborated was at Mont St. Michel, and there one was personally conducted, at a great pace, with no dawdling or straying allowed anywhere, and with no possibility of an appeal to any one for relaxation of the rules. Bureaucratism is worse than the most casual parson.

ARCHITECTURAL EDUCATION IN AMERICA.

THE following report was presented at the Twenty-eighth Convention of the American Institute of Architects, held in Chicago on October 15, by Mr. Henry Van Brunt, chairman:—

The committee on education, on account of the wide separation of its members, has found it impracticable, either in person or by correspondence, to consult together with that freedom which is demanded by the increasing importance and difficulty of the subject committed to them. But the present condition and future prospects of architecture seem at this moment to be so peculiarly dependent upon the character of the training in the professional schools of the country, that your committee venture to present for your consideration a brief and necessarily unstudied statement of the architectural situation, with an inquiry as to the possibility of improving it through a modification of our educational methods.

This statement is made not with the expectation of revealing any new thing, but rather to formulate in a more or less definite way a condition of things which, without any such formulation, is apt to remain without clear recognition, and the suggestion for improvement is offered, less with the expectation of laying before you a practical scheme for reform, than of stimulating inquiry and awakening discussion.

We consider that the present condition of architecture in this country as a fine art, though there are clear indications of a late advance in academic scholarships and in technique generally, is unsatisfactory, because in this advance there cannot be detected any healthy progressive principle. In fact, it is rather a progress of personal enterprise and skill than of principles, and does not seem to promise any large or characteristically national fulfilment. It is made on irregular skirmishing lines, not without evidence of individual gallantry here and there, but with none of that effective unity of effort which is the only means of achieving results adequate and proper to our especial civilisation.

As architecture is now for the first time in the hands of men of education, it becomes very important indeed for us to consider whether this education cannot be such as to inculcate

convictions, to make our young architects the agents of a far more definite and orderly progress, and to inspire them with a certain definite consciousness of duty in respect to the development of a system of architectural forms, less conventional in character and more accurately adjusted to the expression of our new life.

But it is said, "Let us be content to do our duty to our art and to our clients, each one to the best of his ability and according to his best lights, and let the style of our time take care of itself, as the styles of former ages and peoples have been created. For these historical styles have developed themselves out of the political, religious, commercial, ethnological and social conditions, and technique has varied with variations in materials and methods. Why should we attempt to interfere with this natural automatic process of evolution?"

In answer to this question is involved a statement of the difference in the conditions of practice in ancient and modern times. But it seems hardly necessary to repeat this statement before such an audience as this, and to say again that our past is a far larger region, a far greater inheritance than belonged to any of our predecessors, and that our minds are preoccupied and our ideas complicated by an infinite variety of architectural monuments.

The progress of investigation in archaeology has made us familiar with the buildings and arts of every age and race; we have classified and defined the styles; we have theorised infinitely and created a science of æsthetics. We can, therefore, no longer be, like our predecessors, unconscious ministers in the development of style. As our resources have been infinitely expanded, our personal responsibilities to our art have become far greater and our task far more difficult. Architecture has thus necessarily become a learned profession and we cannot do our duty without academies, libraries and museums, and a large equipment of photographs and prints. The architects of the great historical eras, dealing with comparatively simple problems and with only one set of forms at a time, were enabled to concentrate their forces, to develop style without affectations and with infinitely less consciousness of effort than ourselves, who are distracted by our knowledge and perplexed by our exacting reminiscences. These conditions have introduced a new element into the practice of architecture, an element of self-consciousness, of dilettanteism and imitation, which have sophisticated modern architectural manifestations and deprived them of that sincerity, power and simplicity which can result only from concentration of intelligent effort and from strong convictions based, not upon the traditions of the studios, but upon a philosophical analysis of our vast resources of design.

Without presuming to criticise the methods of instruction in our schools of architecture as at present conducted, and certainly with a grateful appreciation of what their professors and teachers have already accomplished in the service of a purer and nobler art, we would ask them to systematise and co-ordinate the study of all the historic styles, as they were successively developed in their progress from picturesque barbarism to the elegance and refinement of the higher civilisations; to make this study an essential part of the curriculum of the schools; to teach the outlines of history by the architecture which was a part of it; not to select certain of the styles for exclusive study, leaving what seems the less interesting and beautiful, the less highly organised or less applicable to our use, to be picked up by chance, if at all. Our project would be to pursue this study of history through its manifestations in architecture from archaic to modern times, or, at least, to the nineteenth century, not with the minute patient scrutiny of the archæologist, but with the spirit of the artist seeking to learn how forms and ornament were developed out of the genius of civilisations and peoples and how, as they were significant of the progress of human culture in the past, they should be used in the service of modern art.

We recognise that the best discipline of the faculties of design can be obtained only by especial and continued practice with the most highly organised of all these styles, and that Classic art must continue to be the means, but not the end of this discipline.

We believe that this organised study of the historical styles would prevent the graduates of our schools from becoming mere spendthrifts with their inheritance, and that with this new knowledge, apparently never before taught, they would learn to be tolerant. "Savoir c'est pardonner." They would practice not with unreasoning prejudice in favour of this, that or the other forms of art, nor with the indifference of eclecticism, but with a sense of the deep significance of these forms, to whatever era they belonged, as expressions of the history of our race, and with a conviction that decorative forms in historical architecture are not mere fashions or accidents of the times, nor mere independent isolated phenomena, but symbols slowly evolved by processes of art from certain definite conditions of human life, as links in a continuous chain of evolution, as genuine and serious manifestations of art, however rude.

Would not this larger comprehension thus obtained of the significance of ancient decorative forms and this increased

respect for them as means of expression have an immediate effect upon their adjustment to modern uses, and ultimately upon the development of contemporary style? Would they not be used with more intelligence and feeling? Would not our young architects be less subject to undisciplined caprice on the one hand, or to academical prejudice on the other? Would they not become in the best sense catholic and more worthy to inherit the inexhaustible wealth of the past? Would they not above all, perhaps, be freed from the mean virtue of conformity or archæological accuracy, which has done more to retard the progress of architecture as a fine art than any other influence except ignorance and pretence?

There can be no doubt that as the true basis of architectural composition of the highest sort is to proportion and to decorate structure, and that as structure is constantly developing with new methods, new devices of engineering and new materials, the architecture of the immediate future must necessarily assume a new character, at least in its outlines, supplanting to a great extent those Classic or romantic ideals or standards which custom has arbitrarily imposed upon modern practice. Are our present methods of education preparing our young men to accept these inevitable changes without a wasteful and futile effort to effect a reconciliation between ancient academic prejudices and these new things? Will the architecture of our country in the next decade express in no doubtful terms the civilisation of America in its best estate? For this difficult task do we not need a much more scientific co-ordination of precedent, a much more philosophic analysis of the architecture of the past than is secured by our present methods of education? The question evidently is, not how are we to effect a compromise between engineering and architecture, but how are we to convert engineering into architecture, how are we to use the immense resources of beautiful precedent at our command in order to translate this prose into the poetry of a high art? The language of form, made accessible to us by a system of study such as we propose, would be as copious as the language of words at the command of Tennyson and Browning, of Longfellow and Lowell. The vast vocabulary of these great masters, these "builders of the lofty rhyme," is made up of words and phrases derived from the entire experience of mankind, not from any especial era or from any selection approved by any school or academy of learning. They could not have expressed their inspirations with any such arbitrary or scholastic limitations of terms. The duties and the privileges of the modern architect in respect to his art are the same as those of the modern poet in respect to literature, but the prejudices of the architect's education have, by exclusions of language, apparently entirely artificial and unnecessary, embarrassed his efforts to express in terms of art the exigencies of modern structure, material and use. He is still trying to write new songs and sonnets and epics in Classic Latin or Mediæval French, and is still wondering that no one but himself comprehends or enjoys them. We are conscious that this analogy between literature and architecture must not be pushed too far, for the two arts have very different messages to deliver to the intelligence of mankind. Architecture of course can express emotions and thought only indirectly by symbols. But the analogy is close enough to support and illustrate our argument.

If the American Institute of Architects should succeed in persuading the schools of architecture throughout the country to teach the whole course of history by architecture, and should open to them the whole series of historic forms in the order of their evolution without prejudice, the genius of the more spacious times in which we live, which are the culmination and the result of all that has gone before, would stand a much better chance for adequate expression. Let the schools teach our young men not to conceal or disguise or condone in a mask of cold convention the inevitable changes of form which must come in process of time with the changes in our social and economic conditions, but to welcome them frankly and express them, not with quotations from other tongues, not with the affectations and pedantries of academical learning, but with the large freedom derived from a comprehensive knowledge of all that has been done or said in forms of art by all peoples.

It seems to us that it is only by some such process as this that architecture as a fine art can keep pace with science. We are not proposing any such folly as the deliberate invention of a new style or any possible amalgam of old styles, but we are inquiring whether it is not practicable by an analytic study of precedent, without arbitrary preferences, to apply to the art of our times a synthetic method of evolution. Our art should be an art of scholars and artists, not of antiquarians, nor of amateurs, nor of pretenders. They should be instructed and inspired by the past, not controlled by it. As viewed from a philosophical standpoint, do not our present methods, without such a comparative study of form as this, open us fairly to the charge of empiricism?

If we may not in this way accomplish a revolution in the architecture of our time (we do not desire a revolution, but a reform), we may at least give to the architects of the next decade a far wider point of view and a far deeper understand-

ing of their functions and responsibilities in an evolution of style which, if it is not directed, will continue to be lost in fruitless and disorderly experiments.

When we see members of the Institute, men of the highest available professional training, repeating at the same times and in the same places châteaux of Francis I., town halls of Henry IV., Italian villas of the cinque-cento, palaces of Palladio, decorating casinos and theatres with every form of Arabian or Saracenic art, building libraries in southern Romanesque, country houses like the farms of Normandy, churches like those of Edward IV. or St. Louis, dwellings after those of every era of English history, public structures in every form of the Renaissance—when we see them dissipating their forces in these barren revivals, each one according to his fancy, we may well doubt if this is the best possible use of our knowledge of precedent. Can the discipline of our schools produce no better result than this confusion of tongues? Is it not time for us to consider how we can work together with profitable unity of effort, each aiding the other? Does not the inevitable modern accent which may be detected in all these attempts to speak ancient languages prove that characteristic modern style is possible, and is only restrained from its full and natural development by the prejudices of our education? If the secret of rational progress does not lie in a more scientific and thorough method of studying the styles and the historical conditions from which they grew, to the end that we may use them not as mere imitators and revivalists, but as artists and creators, where else shall we seek for a remedy?

The new type born of such a study must necessarily be infinitely richer, more elastic, more various than any of those which lie behind it; it must include all their virtues and none of their vices. It would substitute a true vernacular for one which is spurious and vulgar. Architectural effort united upon such a type as this would not imply a uniformity which would soon become wearisome and monotonous. It would rather imply variety and unity, effective concentration of power, and such a concentration means logical and consistent progress. Such a progress with our present methods surely we are not achieving.

Hitherto, it must be sadly confessed, we have treated our great resources, if not like undisciplined barbarians with the spoils of war, certainly more like the arbiters of Parisian fashions than like artists and scholars. The new education, far less pedantic and far more cosmopolitan and generous than the old, and also far more discriminating, must teach us the real value and meaning of our inheritance, and how to use it with a full appreciation of our responsibility to art and to the civilisation of our time.

ITALIAN ART.

AT the opening meeting of the Architectural Section of the Glasgow Philosophical Society on Monday, Mr. T. L. Watson, architect, read a paper on "Glimpses of Four Great Periods of Italian Art." The four periods referred to were:—(1) That of ancient Rome, (2) the Byzantine period, (3) the Middle Ages, and (4) the Renaissance. The lecturer dealt chiefly with the art of the Middle Ages, and pointed out some of the varieties of Gothic architecture that prevailed in the different divisions of the country. The influence of the classical art of antiquity was felt throughout the whole Gothic period, and was seen in the general effect of breadth, in the horizontal treatment and the flat surfaces as opposed to the vertical treatment and the deeply-recessed openings and mouldings of Northern Gothic. It was seen again in the fondness for the single round pillar or shaft, often tapered, instead of the clustered pillar. It was particularly observable in the sculpture both of foliage and of the human figure, and in the use of round arches along with pointed ones. There was a certain defect of the constructive sense seen in the apparent overloading of slender pillars, as well as in the prevalence of iron tie-rods to maintain the arches. A third characteristic was the great wealth of colour produced by various marbles, brick and terra-cotta, and by mosaics and fresco paintings. Many of the painters were architects also, and even those who were not showed an intimate knowledge of architecture. The paintings were really allied to the buildings, and not merely applied. The architecture painted as accessory to the figures was in harmony with the lines of the building, and the figure subjects also had the architectural qualities of symmetry, restraint and repose. The architecture, painting and sculpture of the Renaissance were then touched upon, and the same qualities were illustrated up to the middle of the sixteenth century, after which there was rapid deterioration. In the course of the lecture limelight views were shown, among others being works of the Pisanos, the Della Robbia's, Donatello, Ghiberti and Della Quercia in sculpture; and Giotto, Fra Angelico, Benozzo Gozzoli, Filippo Lippi, Ghirlandajo, Raphael and Andrea del Sarto in painting, as well as many buildings and architectural details.

PUBLIC BUILDINGS IN FRANCE UNDER THE FIRST EMPIRE.

[THESE notes from the unpublished journal of Vaudoyer, the architect, give an extraordinary picture of the versatility, energy and restless impatience of the first Napoleon, as well as of the devotion, self-sacrifice and prodigality of the French people under the stimulus of his leadership. They are taken from the *Amis des Monuments*, No. 43, by permission of M. Charles Normand. We see France, which had only just emerged from the throes of a revolution as disastrous as had ever devastated a country, followed by a succession of campaigns in which she had held her own against the world in arms, embarking upon works for the embellishment of the capital and the perpetuation of the heroic deeds of her Grand Army, without a thought as to the cost, on a scale of magnificence unknown to modern times and which can only be compared to the achievements of the ancient Romans, who were the models and exemplars of the French nation. While in England, exhausted by the strain of a long war, the fine arts had sunk to an extraordinary state of degradation, in France there was a remarkable revival, and architecture, painting, sculpture and the subordinate arts and industries flourished with a vitality and vigour unknown in the time of the Grand Monarque. And this revival was not a factitious revival stimulated and sustained by the Court, but came from the people and owed its strength and impulse to the democracy, who since the revolution felt that they had an interest in their country they had never known before. Architecture appears to have particularly profited by this revival, and the number of architects employed by the State is a very interesting feature of the times. Another feature is the rapidity with which the works were carried out; the Arc de Triomphe in the Champs Elysées was begun before the design had been resolved upon and was pushed forward with astonishing quickness. The same with the column in the Place Vendôme, which was only decided upon on January 1, 1806, and on October 8, 1807, the whole of the stone-work was finished, several of the bas-reliefs were cast and the others were promised before the end of the winter. Cardinal Dubellay died on June 13, 1808, and on June 18 the Emperor decrees him a monument in the metropolitan church. These were stirring times, and, as an enthusiastic reporter exclaimed, "When was ever such a noble career opened to the fine arts!"]

Library of the Louvre, 3 Fructidor, Year 9 (August 20, 1801).—Decree of the First Consul on the report of the Home Secretary ordering the transference of the National Library to the Louvre, and that the private persons lodging in the Louvre should quit the premises before the 1st Frimaire. The present library buildings to be sold. After the 1st Frimaire no fire is to be lighted in any portion of the Louvre. The new library to be installed there in the course of the year 11 (1803).

10 Fructidor (August 27, 1801).—The Minister of the Interior has appointed a Commission, consisting of Citizens Brognart and Noury, architects, Taunay, painter, and Pajou, sculptor, to report as to alternative lodgings in the national domains.

42. Death of Antoine, Architect to the Mint, 7 Fructidor, Year 9 (August 24, 1801).—Citizen Antoine, architect to the Mint, died of apoplexy coming out of the theatre during an excessive heat, after a heavy dinner. He was between sixty-six and sixty-seven years of age; he leaves no family. His death causes a vacancy, with a residence, at the Mint and a chair at the National Institute. Heurtier succeeds him at the Institute.

46. Fair at the Louvre.—A fair has been held in the courtyard of the Louvre for the sale of industrial masterpieces. It is 15 feet deep and the buildings 30 feet long; the passages are 6 feet wide and each quarter consists of Ionic intercolumniations placed 9 feet apart from the centre, with a projecting column 3 by 3 surmounted by a figure on an attic base. The whole has been very solidly constructed under the superintendence of Citizens Raymond and Chalgrin.

48. Colossal Bust of Bonaparte at Marseilles by Chardigny, 9 Vendémiaire, Year 10 (September 30, 1802).—In the *Journal des Bâtimens Civils* of the 9 Vendémiaire, year 10, description of a new avenue and monument to Bonaparte at Marseilles by Chardigny.

49. Biography of Antoine, 9 Vendémiaire, Year 10 (September 30, 1802).—Lassant makes a report (printed) on the late Antoine, architect to the Mint.

51. The Academy of Four Nations, 19 Vendémiaire, Year 10, Government Decree (October 10, 1802).—*Art. 1.*—The school of painting, sculpture and architecture will be transferred to the College Mazarin, and will be called the Palace of Fine Arts. *Art. 2.*—The professors attached to the school will be lodged in the palace. *Art. 3.*—The Sorbonne to be placed at the disposal of the Home Secretary (Minister of the Interior), for the housing of literary men and those artists who cannot be accommodated in the College Mazarin. *Art. 4.*—The central School of Four Nations to be transferred to the Collège du Plessis.

77. **Removal from the Louvre.**—Artists to receive official notice to remove. Some to be rehoused in the Academy of Four Nations, at the Sorbonne and at different hotels. Those who cannot be rehoused, for want of room, to be promised 300 livres a year. Those who are rehoused to receive at once, at one payment, a sum of 300 livres for the expenses of removal; those who are not rehoused not to receive this indemnity. The lodgings of the late Citizen Mouchy in the galleries, which have been vacant for six months, are to be given to Citizen Vien the younger, with a view to the keeping up of these lodgings.—(See *Art.* 51.)

53. **Place Bellecourt at Lyons, 1 Brumaire, Year 10** (October 22, 1802).—The Prefect of the Rhone has instituted a competition for rebuilding the Place Bellecourt at Lyons. It is feared that he will fall a victim to his mistake, and that the work will be given to a competent man who will not compete in consequence of the disrepute and state of degradation into which competitions have fallen. Linguet says that it is only parish priests who enter into them in good faith.

54. **Monument to Bonaparte and Peace (at Paris) by the Department of the Seine, 10 Brumaire, Year 10** (October 31, 1802).—The Prefect and the Council of the Department of the Seine decree that a monument shall be raised at Paris which shall transmit to posterity the gratitude of the City of Paris to Bonaparte, the First Consul. The general council, acting as the Municipal Council of Paris, adopted without discussion and appointed a commission, consisting of Citizens Bellard, Perrier, Demantort and Quatremer, to report in ten days and to take measures to facilitate the erection of the monument. The monument will take the form of a triumphal portico, which is proposed to be placed on the Place du Châtelet. Bonaparte has accepted, but has adjourned the execution for posterity, if it confirms this decree.

57. **Colossal Statue of Bonaparte, 16 Brumaire, Year 10** (November 7, 1802).—Citizen Comolli, director of the Academy of Sculpture, Turin, exhibits for 30 livres a head Rue de Lille (Hôtel de Salm), a statue of Bonaparte as a peacemaker, 12 feet high, sheathing his sword.

65. **Statue in Pewter (for blanc) 14 Frimaire, Year 10** (December 4, 1802).—The King of Prussia is about to erect a statue to his great uncle at the barrier of the Allée des Tilleuls. The statue and horse will be of pewter, painted in natural colours as if they were alive, and will be placed on a mound (tertre) 6 feet high, without a pedestal.

66. **Chandeliers of Theatres, Frimaire 10^e.**—The chandelier of the Théâtre Français, Rue de Richelieu, containing . . . argand burners (quinquets*), has cost 40,000 livres (1,600*l.*). The chandelier of the Theatre of the Opéra, Rue de Richelieu, containing 100 argand burners, cost 75,000 livres (3,000*l.*). They are suspended by brass wire ropes (laiton), containing from 400 to 500 strands.

80. **Library of the Louvre, 23 Thermidor, Year 10** (August 10, 1802).—Decree of the Consuls of 23 Thermidor. The necessary works for the dilapidated buildings and the library will be pushed on with the 25,000 francs (1,000*l.*) a month advanced by the Treasury, to be repaid out of the result of the sale of the old materials and fittings of the old library.

89. **Garden on the Peristyle of the Louvre, 15 Frimaire, Year 11** (December 5, 1803).—The late M. Vatelet resided for a long time in the south-east pavilion of the colonnade of the Louvre. He had the use of all the flat roof of the colonnade from this pavilion to the pediment in the centre. This terrace is covered with lead. M. Vatelet covered it with earth from 3 to 4 feet thick for its entire length, and laid it out as a garden, which remained from 1770 to 1790. The trees in it were strong and shady. Citizen Janvier, a clockmaker, who succeeded him, complained in 1792 of the percolation of water through the joints of the soffits and architraves. M. Hubert, the then architect to the Louvre, paid no attention, and it was only after much difficulty and delay that the earth was removed. Two men were employed for eleven days throwing the earth over the balustrade into the courtyard. The lead was found to be in holes and the joints of the masonry were decayed and open. The lead was repaired and gardens will no longer be allowed on the terrace. How could M. Vatelet, who was a lover of the fine arts, allow himself such a destructive indulgence and the architects put up with the evil for twenty years?

95. **Quay Bonaparte, 15 Messidor, Year 10 (? 11)** (July 3, 1802).—M. Chaptal, minister of the interior, with the corps of the Ponts et Chaussées, lays the first stone of the Quay Bonaparte; it is partly opposite the Rue de Bourgogne, which is three steps below the level of the footway of the said quay. This quay will have had two first stones in ninety-four years, one at each end, as the construction of the quay, starting from the Pont Royal, was authorised by a decree of the Council given at Versailles, August 30, 1707, and Boucher Dorçay, mayor of Paris, laid the first stone, July 3, 1708.

* Named after Quinquet, the maker's name, but invented by Argand.

129. **Low Opinion of Architecture and the Fine Arts, 30 Pluviose, Year 13** (February 18, 1805).—Architecture vegetates, and no public buildings are undertaken; those already built are abused by being made use of by institutions varying in object, and consequently in wants and arrangement, every two or three years. The Luxembourg has already been put to different uses five times, without taking account of what will yet be done with it.

The sovereign does not like architecture; his ministers in consequence mistrust everybody calling himself an architect, and to flatter the prince do not hesitate to proclaim it. Here is an extract from the report of the Finance Minister to the Emperor, taken from the *Journal de Paris* of Pluviose 30, year 13 (February 18, 1805). "How often have we heard from his lips—the greatness of sovereigns does not consist in the vast extent of their domains, nor in fortresses which call forth the efforts of the enemy instead of arresting him, nor in the public buildings erected by the vanity of one generation which the indifference of another generation allows to fall into decay. It consists in its institutions, which strengthen the mind, which preserve manners, which diffuse enlightenment." Louis XIV. thought quite otherwise, and his public buildings, by animating every branch of industry, considerably enriched his kingdom, attracted numbers of foreigners and increased his fame.

112. **Imperial Grand Prizes every 10 Years, 24 Fructidor, Year 12** (September 10, 1804).—An imperial decree at Aix-la-Chapelle establishing grand prizes, to be given every ten years by the Emperor's hand, that is to say, 9 of 10,000 livres (400*l.*), 13 of 5,000 livres (200*l.*), to everything useful and great except architecture, the art pre-eminently for the illustration of empires.

164. **Numbering of Houses in Paris, 1 Vendémiaire, Year 14 (?)** (September 22, 1806).—The prefect of the department has had the whole of the houses in Paris numbered. The numbers are painted in oil with nails (*clous*), grounds and shaded letters. The work was put out to tender in four sections. One section was tendered for at 19 centimes a number, including nails (*clous*), grounds, figures, shading, &c.; another 20 centimes, another 21 centimes, another 23 centimes; the even numbers are on the right of the streets, starting from the centre, the odd numbers on the left. The numbers running from north to south are red, those running from east to west are black.

175. **Column to Napoleon at Paris** (January 1, 1806).—The Tribunal agrees to erect a monument of arts and a column to H.M. the Emperor (*Nouvelles des Paris*). "Last Monday the Tribunal held an extraordinary meeting at which, after having heard the report of the members of the deputation which had been to the Grand Army, M. Jard Panvilliers proposed to proceed immediately with the inauguration of the flags sent by the Emperor; M. Favard proposed to have a medal struck relative to this donation; M. Chabot (de l'Allier), to name one of the open spaces of Paris, Place Napoléon le Grand. M. Faure, the reporter of the commission appointed to erect a monument, has proposed in its name to erect on one of the principal squares of Paris a column and a national edifice, in which to place all the national works of art (*Monuments des Arts*), with the sword carried by the Emperor at the battle of Austerlitz, and to establish an annual festival.

178. **The Emperor Visits the Works of the Louvre and of the Sculptors remaining there** (February 1, 1806).—January 30, H.M. the Emperor visited the works of the Louvre. He seemed satisfied with the progress of the buildings, and to see what had been the subject of discussion for more than a century carried into execution in less than two years. After having entered into the minutest details with the architect, His Majesty has given fresh orders to add still further to the splendour of this noble asylum of science and art. He examined with no less interest in M. Moitte's studio the tomb of Desaix, which will be conveyed in the spring to the monastery of Great St. Bernard. On leaving this studio he afterwards visited M. Dejoux's studio and appeared pleased with the plaster model of the same hero, which will be executed in bronze to decorate the Place des Victoires. In the course of his visit the Emperor, who was unattended, crossed the courtyard of the Louvre in the midst of the people, who crowded around him, and by their exclamations of delight expressed their joy at the air of goodness and satisfaction imprinted on every feature of the sovereign (*Journal de Paris*). On returning to the Louvre the Emperor, on passing through the museum, observed the colossal bronze bust executed during his absence, and which is now placed in the Apollo Gallery, and "et toute la suite si curieuse qui manque."

183. **House of Prince Eugène, Stepson of H.M. and his adopted Son since that Prince was made Viceroy of Italy** (February 1, 1806).—During the last eighteen months M. Bataille, architect, has been adapting No. 82 Rue de Lille as a residence for Prince Eugène. The arrangement is magnificent. The Emperor had the bill sent to him, which amounts to 1,500,000 francs (60,000*l.*). This put him out of temper, and he stopped the works, which were nearly completed.

187. **Throne by Auguste** (February 20, 1806).—"It is said that Le Sieur Auguste, a talented goldsmith, has presented drawings of a throne which for richness and workmanship will come up to the splendour which the court of France should exhibit in State ceremonials." This throne was invented and drawn by MM. Lebas and Debret. M. Auguste has not paid them for their work and has appropriated their fame. He has been declared bankrupt.

200. **Palace of Chambord, to be adapted for the Education of 100 Young Daughters of Members of the Legion of Honour** (May 10, 1806).—Decree of May 2, ordering that the palace of Chambord shall be adapted to maintain and educate 100 young girls, daughters of members of the Legion of Honour. The expense will be defrayed out of the funds of the Legion. The grand chancellor of the Legion, M. Lacépède, is entrusted with the execution of this decree.

201. **Triumphal Arch of the Star**.—The difficulty of erecting a triumphal arch at the Bastille having been demonstrated by the commission, it is settled that it shall not be erected at the Bastille, but at the Barrière de l'Etoile at the end of the Champs Elysées. MM. Chalgrin and Raymond, architects, of the Institute, are entrusted with this monument, which in view of its position will be of colossal size and will cost several millions. The foundation will cost 900,000 francs (36,000*l.*).

203. **Triumphal Arch or Column at l'Etoile** (June 1, 1806).—The works for the erection of a triumphal column on the Place de l'Etoile, beyond the Chaillat barrier, were commenced three days ago. The workmen have excavated the site for about 30 square mètres for the foundations of this new monument; materials are arriving daily. Enormous blocks of wrought stone are already lying about this vast open space on which converge the four routes of the Champs Elysées, Neuilly, Roule and Passy (*Journal de Paris*).

The newspaper is in error in speaking of a triumphal column: it is a triumphal arch which will be erected at l'Etoile, unless the plans are changed. On August 15, 1806, the excavation having been carried 23 feet deep in very firm sand, the first course of footings (?) was laid.

(To be continued.)

ARCHÆOLOGY IN CRETE.

AT the meeting of the Hellenic Society on Monday last Mr. Arthur Evans, Keeper of the Ashmolean, read a paper on his discoveries in Crete. He observed that in the absence of abiding monuments we ought not to forget that evidences of early culture could be traced in other forms than those of the remains of ancient buildings. Traces of picture writing are to be found in various parts of Europe—in Denmark, for example—and abundant remains of this character were discovered in Crete. Last year in Crete he found curious seal stones containing symbols affording singular parallels to the Hittite monuments. There was also an unclassified stone found by Mr. Greville Chester which fitted into the same series. It was clear that there had been a civilisation before the foundation of the Greek States. The remains seemed to indicate that Greek particularism had been prejudicial to the early civilisation of Crete. There were inscriptions, which might probably be assigned to about 700 B.C., in archaic Greek characters, but in a language which was unknown to us. The foundations of houses and shrines were of much the same type as the remnants still extant of Tiryns and Mycenæ. The ruins were also found of a second acropolis like the pre-historic city of Troy. There was also a remarkable monument, which deserved investigation, of a Mycenæan building which might be the famous labyrinth, or a palace. Traces of it were first discovered by Mr. Stillman. There were many pictorial symbols, from which seventy or eighty different symbols had been roughly classified. From these remarkable parallels might be traced with Egyptian and Hittite inscriptions and picture writing. The date of some of the remarkable correspondences with the Mycenæan type was probably about 1500 B.C., but the earliest class of symbols may even have been before the Mycenæan period. There had also been found Egyptian scarabs of the twelfth dynasty; and there were the beginnings of the spiral system which played so great a part at Mycenæ. Linear forms were discovered to have gradually grown out of the pictographs, and there was evidence for believing that the Cretan system was part of a larger one which extended to the Peloponnese. Parallels might also be discovered with Semitic remains, and those were remains of a character which should make us hesitate to accept the theories of the origin of the alphabet from hieratic forms. The origin of the Philistines might perhaps also be traced through Crete, and it was remarkable that in the version of the LXX. the Philistines were called Cretans, or even Hellenes, which led to the conclusion that they were probably islanders. It was probable that the Philistines played a great part in civilising Semitic lands.

WANDERINGS IN NORTH AFRICA.

A PAPER was read by Mr. Thomas Kay on his "Wanderings in North Africa," before the Manchester Literary Club, on Monday. It was supplemented by several water-colour drawings by the author and oil paintings by Mr. R. G. Somerset. Mr. Kay described the present condition of Tebessa, the Theveste of Hadrian. It was built by the Romans to form a guard and fortress against the predatory Bedouins of the great Sahara, which lies to the south. It possesses now the same supply of good spring water which the Romans conducted within its walls. The assaults upon Tebessa in ancient days reduced its inhabitants so much that under Saracenic rule the walls were built to enclose only a part of the old city, and in them are to be observed massive pillars laid horizontally through them, for their strength and immovability, at the expense of some majestic buildings destroyed to make these defences. Fortunately, on the lines of the new walls the triumphal arch of Caracalla was enclosed, and made into a gate of the city. The date of this arch is about 212 A.D., and is a fine and well-preserved example of the four-faced gate. The basilica at Tebessa is one of the most remarkable ruins of a complete edifice of the Roman period to be found in Africa. The great hall is about 200 feet long by 25 feet wide. The fine tessellated pavement is still perfect in the great hall and in the judges' chambers, but is covered with earth for their preservation. The Roman aqueduct for the supply of Carthage was also described. It is a distinct landmark over the long plain, although the magnificent tiles and marbles used as ornamental work have been taken away. The aqueduct delivered 7,000,000 gallons per day to Carthage and the district. Its remains are fast disappearing, being used by the French in the making and repairing of roads. Constantine, which occupies one of the most remarkable and picturesque sites in the world, possesses now few remains of its ancient grandeur; its mosque has been converted into a Christian church, the citadel has been rebuilt and converted into a modern French barracks. One prefers to think of it as the acropolis of Massinissa, the brilliant fighter whose story lives in history as a revelation of the character of the men of the distant past. The story of Sophonisba, one worthy of the tragic muse, is also set in this city of Constantine. It has occupied the pens of both English and French dramatists, though Thomson spoiled it not a little with his absurd "Oh, Sophonisba! Sophonisba, oh!" The paper concluded with a description of the phosphorescent effects seen at night off the coast of Africa.

GENERAL.

An Exhibition will shortly be held at the Ecole des Beaux-Arts in Paris, which is to illustrate the excavations undertaken at Delphi by the students of the French school in Athens.

A Statue of Meissonier, by M. Fremiet, will be unveiled on Sunday next in Poissy, a town where the painter lived and served as *maire*.

The **Damfries School Board**, after considering plans and estimates for reconstruction of the Academy buildings, have decided to invite architects to send in plans for a new building. The estimated cost of reconstruction is about 7,000*l.*, while new buildings are estimated to cost only 10,000*l.*

Mr. Johnson, of Abergavenny, has been selected as the architect of the new workhouse infirmary which is to be built at Merthyr, at an estimated cost of about 10,000*l.*

Mr. George Highton has been elected to the vacant vice-presidential chair of the Society of Architects. It is understood that Mr. Highton continues his close connection with the administrative body in order to help forward the examination for membership which was inaugurated in his year of office.

Mr. G. B. Birch has been elected curator of Sir John Soane's Museum, in succession to the late Wyatt Papworth.

Mr. Richard Clarke, who was for many years known as a valuer in Birmingham, Walsall, Wolverhampton and the surrounding districts, died on the 16th inst. of typhoid fever. He was in his forty-third year.

The Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels held its first monthly meeting for the present session on the 15th inst. at the Society's house, No. 7 Dean's Yard, Westminster Abbey, S.W., when many grants were approved.

The Directors of the Aberdeen Royal Infirmary have received a letter from Mr. D. M. A. Chalmers, advocate, intimating that the trustees of the late Mr. John G. Chalmers, Banchoory, were prepared to give from his estate the sum of 5,000*l.* (2,000*l.* to the building fund and 3,000*l.* for endowment) towards a proposed new convalescent hospital, on condition that it be conducted as part of the Royal Infirmary.

The Architect.

THE WEEK.

THE London Building Act, which comes into operation on January 1 next, has a number of provisions with respect to the height and curtilage around buildings, as well as other matters that are of great sanitary importance. The Council of the Sanitary Institute have, therefore, arranged for a discussion to be held at the sessional meeting on December 12, at 8 P.M., on the sanitary aspects of the Act. It will be opened by Dr. G. B. LONGSTAFF, chairman of the building act committee of the London County Council. Other members of the County Council, members of local boards and vestries, and officers who will be concerned in carrying out the provisions of the Act, are expected to take part in the discussion.

A MEMORIAL has been sent by the Glasgow Institute of Architects to the Town Council respecting the practice adopted for designing Municipal Buildings in the city. The objections of the Institute are as follows:—1. The city engineer, as he is not an architect, is not himself qualified to design works of architecture. Even if he were so qualified, the duties of his office are such that he cannot have the time at his disposal for the quiet conception and elaboration of the design of public buildings, nor for the efficient superintendence of such works in course of erection. 2. To depute such work to assistants, however qualified, cannot be so satisfactory as it would be to commission independent architects of ability and experience. An assistant has neither the stimulus nor the sense of responsibility of an independent architect and there is no assurance of permanence in his position. Should he develop marked ability, it is probable that he will either elect to practise in his own name, or accept an office of more importance in another city. In dealing with contractors, in securing that the terms of a contract are faithfully carried out, and in the settlement of accounts an architect has more authority, as he has more direct responsibility, than any assistant, however competent he may be. 3. The existing arrangement is not an economical one, and on this ground alone the subject is worthy of full consideration. 4. The design and erection of the public buildings of a city are among the opportunities that architects are entitled to look to for the exercise of their abilities, and their employment would offer to the authorities a much wider field for the selection of architects possessed of special qualifications for particular work than they can have among the assistants of the city engineer. The Council of the Institute do not undervalue the knowledge and experience of the master of works, of the city engineer, or of their staff; but they believe that the attainments of these gentlemen would be of more advantage to the community, so far as important public buildings are concerned, if they were used in the first place in advising the committees of the Town Council in charge of such works, and afterwards in consultation with the architects who should be employed to design them. 5. It is among the most important duties of a municipality, acting on behalf of the community they represent, to foster and encourage the arts, and particularly the art of architecture, upon which the amenities of a city are more dependent than on any other. The Council of the Institute submit with confidence that the course they recommend to the consideration of the Town Council, in addition to its other advantages and economies, would tend, both directly and indirectly, to the improvement of the architecture of the city.

THE advance due to experience in the planning of schools is seen in the action of the London School Board about the school in Olga Street, Bethnal Green. It was erected twenty years ago, and was supposed to exemplify the practice of the time. The inspector of the Education Department lately described the infants' school as "conducted under considerable disadvantages, the arrangement of the premises being adverse to proper organisation.

Many of the classrooms have to be used as passage rooms, a most undesirable arrangement, which ought if possible to be modified. Most of the classrooms are badly lighted." The architect of the Board, to whom the matter was referred, is of opinion that it would not be advisable to incur any expenditure upon the present infants' department, owing to the serious structural difficulties in the way of its improvement. The works committee, after careful consideration, have come to the conclusion that it will be more economical to erect a new infants' school upon additional land, the cost of the new building being estimated at about 6,000*l*. It is also considered desirable at the same time to rebuild the present offices in another position and to provide a new system of drainage, the cost of this additional work being estimated at 1,500*l*. Application will accordingly have to be made to the Educational Department to sanction the loan of 7,500*l*. for the work.

THE French publication *L'Art* appears to become still more English as the volumes appear. A series of etchings on a large scale, after Sir J. REYNOLDS, is now appearing among the numerous illustrations, the latest example being the *Lady Mary Dashwood and Child*. Another etching in the last number is one of the late Mr. P. G. HAMERTON'S Scottish scenes. M. PAUL LEROI does ample justice to the author's merits. M. ERNEST CHESNEAU, whose book on the English school is appreciated, has an elaborate article on DANTE ROSSETTI and the pre-Raphaelites, which surprises from the extent of the author's acquaintance with modern English art. An article on HUBERT ROBERT is interesting, and it is embellished by copies of many of the artist's representations of Italian buildings. *L'Art* being now in its twentieth year may be said to have attained its majority, and it still upholds the excellence with which it started, a remarkable feat for a publication of its class.

THE church of St. Michael, Linnithgow, is one of the most interesting in Scotland. It is of great antiquity. Unfortunately, it was one of the few churches that suffered at the time of the Reformation, for it should not be forgotten that JOHN KNOX preached no crusade against buildings. In CROMWELL'S time the soldiery were more vandalistic, and the surviving pictures, statuary and carved work were destroyed, the only statue escaping being that of St. Michael, on the southern corner, which from its exalted position was beyond their reach. At present the church is being restored under the care of Mr. JOHN HONEYMAN, who is carefully reproducing the old lines as far as possible. A paper on the subject was read before the Glasgow Archæological Society on Tuesday, when a warm recognition was made of a lady's generosity in enabling the architect to restore the beautiful chancel arch which had been broken down in 1811, to make room for the hideous galleries erected in the choir at that date. Many interesting details were brought out in the subsequent discussion. The hope was expressed that the restoration of such a stately and ancient church would not be retarded through lack of funds, and that lovers of Church and country would not be slow in supplying the 15,000*l*. required.

THE "Railway and Traders' Calculator" and the "Direct Calculator," prepared by Mr. M. B. COTSWORTH and published by Messrs. CROSBY LOCKWOOD & SON, are the most ingeniously arranged and the legiblest of all ready reckoners. They have been arranged to suit the new railway rates, and for all who have to pay carriage on goods they will save time in calculating and insure accuracy. Their utility is not confined to that purpose. They are no less helpful in all business transactions which depend on weights. The calculation of wages is also an advantageous addition. The tables are printed on stout paper which will bear rough handling, and the indexes are on canvas strips. From their simplicity they can be used by men who are not expert arithmeticians, and the quickest calculators would admit that they could not compete with them in working out intricate multiplication.

METALLIC CONSTRUCTION IN AMERICA.

"WHEN I asked an ironmaster about the slag and cinder in iron," says EMERSON, "he said, 'There's always good iron to be had; if there's cinder in the iron 'tis because there was cinder in the pay,' and the words must appear to be more significant to anyone who reads an account of the Architects' Convention which was held about a month ago in Chicago. That metal is largely employed in the construction of buildings, and especially the lofty buildings in American cities, is known to all the world, and it must always be expected that when architects or contractors meet in conference they will talk about columns and girders. On such occasions it is to be anticipated that the merits of the materials will be expounded, and that new developments of their use will be foreshadowed. Iron and steel are more closely connected with the nineteenth century than with any of its forerunners, and it is allowable that all who make use of either should be hopeful about the future. But from what was said in Chicago it might be supposed that the materials are found to be a delusion, and that structures containing them are about to vanish, owing to their inherent weakness.

If more than the usual quantity of slag and cinder were lately mixed up with the metal that would be enough to excite despondency. But probably the cause arises from the introduction of iron and steel to an excess in buildings. Americans are fond of analogies, and apparently they consider they are following the examples set up by nature when they make a sort of skeleton of iron and steel for every building and employ other materials as a mere covering or wrappage. The practice, which is now common in the United States, of regarding a building as a metallic cage, with a continuity of iron or steel beams and columns from roof to foundations, certainly never entered into the visions of TREDGOLD, or FAIRBAIRN, or the pioneers in iron construction. Whether their primitive and timid ways were right or wrong remains to be seen, but they would not serve in America.

At the Chicago Convention the attack on metallic construction was led by Mr. GEORGE B. POST, who was described by the chairman as having more experience than any other man in America or elsewhere in the construction of tall buildings, one being 350 feet high. He began with the following remarkable prophecy:—

It is my positive opinion, formed after considerable study of the subject and consultation with the best engineers that I could get hold of, that the life of buildings constructed with steel cages will be but short. They will last longer than I will, but I believe that there are men in this room who will live to see the necessity of taking down many of these buildings, or else of resorting continually to most radical systems of repair in construction. In my individual experience I have taken out from a building a number of wrought-iron beams which had been thirty-five years encased in solid brickwork—not in plaster, as we build at present, but with 8 inches of brickwork around them and levelled up to the floor with concrete. These beams had been subjected to live steam, as they formed the ceiling over a well-conducted engine-room, a room containing printing-presses, and very many of these beams were entirely destroyed by rust; you could take them and break them, in this way, with your finger. As far as I know, it is impossible, with paint or asphaltum, to protect a great system of steel or iron construction so that it will not be assailed by rust, so that we can surely protect it in all its parts from corrosion.

We imagine that EMERSON's ironmaster, if he heard Mr. POST, would ask whether the beams were produced at a fair price? Wrought-iron so well protected would not dissolve, if we may judge by English experience, unless there was a superabundance of slag and cinder. In Europe it is supposed that the worst iron that can be produced is durable, especially if from time to time it receives a coat of paint; but we suppose American ingenuity can compound stuff of a kind which is unknown among us. Mr. POST explains the phenomenon by saying that as the beams are laminated, and are corroded by moisture or gas, they cannot last long. It cannot be denied that, like all things on earth, iron and steel are doomed to destruction, and rust is only a consequence of an universal law. Thirty or forty years ago the danger arising from the action of the atmosphere was underestimated, and the webs of beams were made of the thinnest of plates as if rust was an impossibility. There is now more prudence exercised, for it is known that the thickest web plate is not entirely waste of material, as it sustains its share of strains. When beams were entirely inaccessible there was also increased

risk, as it was not feasible to protect the surfaces periodically by painting or other treatment. Mr. POST says he always has made his cage detached in order to permit painting or repairs, and so long as that sort of precaution is taken iron and steel are safe. On account of being less liable to corrosion, Mr. POST recommends the use of cast-iron instead of steel for cages, but few architects will care to make the experiment. If science could furnish a convenient process for detecting flaws or irregularities in casting, the material might then be more often introduced in buildings. Mr. ROBERTSON, while admitting the danger of corrosion, proposed to minimise its effects by the use of lattice girders, with the interstices filled in with brickwork:—

It seems to me that 8 inches of brickwork on the exterior of all the construction, with latticed girders instead of the old method of double beams at each panel, with the brickwork built in through the openings of the latticed girder, making a complete bond through the construction, with the building carefully painted on the exterior, will almost indefinitely protect iron or steel which should have been, before it is placed, of course, properly painted—almost indefinitely protect them from corrosion; but the point that should be looked at first is that all the joints in the exterior of the building should at all times be kept thoroughly painted, and that the building should be thoroughly painted. For I believe that paint on the exterior of the building is a very valuable protection, much more so, in my opinion, than glazed brick. And the only fear then would be, it seems to me, that some unseen fissure or joint might be left open, and water reach some of the vital parts of the building and corrosion take place, which might ultimately bring about trouble. But it seems to me that with a little expense and considerable attention that the whole exterior of the building should be entirely protected from the possibility of the absorption of moisture.

The examples which Professor BURR was able to refer to from his own experience are enough to make everybody sceptical about American ironwork. In one instance two large cast-iron weirs became useless within a fortnight from cracks. At another time numbers of the castings employed in elevated railways exploded, making a noise like so many pistol-shots. Castings have fallen into such disrepute, American engineers will only employ them for wall-plates. Professor BURR considers that wrought-iron will resist corrosion equally with cast-iron. He buried plates of both for about two years, and on taking them from the ground he could not discern any difference between them in appearance. Professor BURR denied that steel beams suffered from lamination, a theory which corresponds with the observations on this side of the Atlantic.

Mr. BURNHAM related some instances of his experience of cast-iron which will suggest the peculiar sort of morality which prevails in American manufactories:—

There was a column in the first storey of an eight-storey building. It was inspected in place. I don't know what led me, or the superintendent on the job who came to me, to fear that there was something radically wrong, but at any rate—the column was about 2 feet in diameter and of 2-inch metal—a workman with a point and a striking hammer was sent to that column and two others to test the surface. He found that that particular one was honeycombed three-quarters of the distance around it, the surface, and at least 3 feet high, so that there was not remaining, in places at least, one-half the periphery, more than a quarter of the metal. It was filled with white metal and had then been painted over very carefully. There was a column brought to one of our buildings one morning for the basement, about 10 feet long, perhaps 12; it was a ten-storey building; the column was, I think, about 2 feet in diameter and of 2-inch metal. In handling it from the wagon it fell on the street and broke. There was an air chamber in that column three-quarters of the distance around it and it was at least 2 feet long; it extended nearly around the column; it was absolutely concealed inside; and it was so well concealed that if struck with a hammer, I doubt if anyone not having an extremely delicate ear, could have detected the flaw. Luckily that column broke and disclosed that condition. Since that time I never have used a cast-iron column because of the impossibility of making a proper inspection which would cover the air chambers inside of the casting. But I don't suppose there is ever a column set up originally which is perfect.

Defective casting will take place under the most honest superintendence, but in the above cases the flaws were concealed, and life as well as property was risked for the sake of a trifling saving.

Apparently it is not the metalwork alone which is defective. The following remarks on the mode of building in New York at the present time, by Mr. POST, indicates that bricks are of an extremely loose texture, and when combined with cindery iron, destruction cannot long be delayed:—

I think it is terrible to see buildings going up in the city of New York as I have seen them going up during the last two or three years,

where the iron columns have been given a very light coat of paint, very little attempt made to protect the joints—put up, it seemed to me, with a good deal of recklessness, in a good many cases with no protection except 8 inches of ordinary brickwork. I do not believe they will stand for any very great length of time with perfect safety. I do not know if you gentlemen have had the experience with brick walls that I have. I have seen the water, in a north-east storm in the city of New York, go through a 4-inch brick wall and run down on the inside of its surface as though there was nothing there; a wall 150 feet high, exposed to a north-east storm, and water go through a 4-foot wall at the second storey and run down on the inside, the wall being unpainted. The condition of a beam encased in cement and in a foundation is a very poor guide for what will occur in a case where there is a north-east exposure, we will say, on a wall with only 4 to 8 inches of masonry. Every time that a storm strikes that brickwork it becomes soaked with water, and will remain soaked for a considerable time.

After such revelations, it appears to be absurd for an European to visit the United States in order to increase his knowledge of construction. The worst jerry-built houses of English towns are less dangerous than the cloud-clapped American buildings, which, like those in PROSPERO'S pageant, seem destined to dissolution rather than decay.

THE GERMANS AND CLASSICAL ARCHÆOLOGY.

THE announcement this week about the request of the Greek Government to the German Government for an architect who would be competent to decide upon the best way to preserve the Parthenon is humiliating to the English people for several reasons. A commission of Greek and German architects it appears has already discussed the subject, but the members are not unanimous about what should be undertaken. An arbitrator is therefore sought, and as a matter of course he is to come from Germany. If the Greek officials were asked what directed their choice they would have no difficulty in replying. It would be pointed out that for the greater part of the century the Germans have been engaged in a systematic study of archæology in many parts of Greece as well as within the boundaries of the ancient Roman Empire; that the most important discoveries are associated with the names of Germans, and that a student is not supposed to be acquainted with the elementary facts of classical archæology unless he has studied under a German professor or from German books. It could be also shown that in England and America Germans are sought out to become professors of the subject in universities and colleges, that English essays on classical archæology are notoriously made out of German publications, and so general is the belief in the monopoly of knowledge on archæology and art by the Germans, that it requires some courage in an English traveller to be seen in Rome or Athens carrying a guide-book which was published in England. For all these reasons, besides others unmentioned, the Greek Government would say they expected the approval of the whole civilised world when they sent to Berlin for an architect to determine the fate of the Parthenon and the operations to which it must be subjected.

It is only natural that many Englishmen will consider the Greek Government to have acted unwisely. They will say that the whole world, including both Greece and Germany, can yield evidence of the constructive skill of Englishmen, and that an English architect would be likely to devise the simplest way of remedying the disturbances in the masonry of the temple which arose out of the earthquake. It could also be explained that if one English ambassador despoiled the temple some compensation was returned by the efforts which STUART, REVETT, PENROSE, PENNETHORNE and others made to reveal all the beauties of the building. A Greek would agree with that view and be complimentary about English construction, but he would say that all the English efforts were those of individuals and never received any public sanction, consequently they have not much impressed people outside England, while the Germans seem to have followed a prepared plan or which the whole Fatherland was, as it were, responsible, and the work of the humblest explorer could not be considered as a mere individual effort arising out of accidental circumstances.

It must be allowed that the Germans have not only worked but combined for the supremacy which they have

attained in classical archæology. We may not be satisfied with their success, but there is too much regard for justice in England to withstand the appreciation of efforts which have been well advised, continuous, enthusiastic and self-sacrificing.

Nor should it be forgotten that in Greece Frenchmen and Englishmen had gained a hold on the country and its architectural remains long prior to the appearance of the Germans. In the seventeenth century it was the custom of the French ambassadors to render personal homage to literature and art in Greece. In 1632 the Baron CORMENIN, in the account of his "*voiage fait par le commandement du roy*," describes the Parthenon. The Marquis DE NOÏNTEL had drawings made by CARREY, one of LEBRUN'S pupils, which will always be invaluable, if sometimes puzzling. Some time between 1630 and 1640 a French consulate was established in Athens. In the convent of the French monks the respect of art and antiquity was religiously professed, and one of the priors purchased the monument of LYSICRATES in order to preserve it from demolition. The French Capuchins in the sixteenth century prepared a bird's-eye view of Athens for the instruction of travellers. The books of BOBIN (a Jesuit), SPON (a medical doctor), and others, are evidence of the interest which two centuries ago the French felt for Greece. Of all Western people they have the best claim to priority of possession, and if they desired they might have acquired every ruined temple in the country, and filled France with ancient marbles.

WHELER, whose book appeared in London in 1682, is probably the earliest representative of England who was occupied with the archæology of Greece. STUART and REVETT visited Athens in 1751, and a few years later the researches of the Dilettanti Society were commenced. But so little was Greek work appreciated in this country, it was necessary for Lord ELGIN to support his application to Parliament for the purchase of the Parthenon sculpture by the testimony of CANOVA and VISCONTI. Before his lordship started for Greece, he informed the Government of that day about his intentions, and suggested that the rescue of the marbles should be considered a national object, and be undertaken at the public expense, but he received no encouragement. Up to the present the most efficient English agent in exploration has been the Dilettanti Society, the most exclusive of bodies, and one that scorns support or advice from outsiders. An effort has been made during late years to establish a British Academy in Athens, but it has obtained only scanty assistance, and the interest in the operations is confined to a few men and women.

As far back as 1573 MARTIN KRAUSSOR, or CRUSIUS, a Tübingen professor, entered into correspondence with some of the Greeks that lived in Constantinople. In 1584 he published several of the letters he received, in the hope of exciting interest in the country, and especially in Athens, which, as one of the letter-writers said, resembled "the skin of an animal which has been long dead." But Germany, which was broken up into petty States, was not in a condition to do much for archæology. It was not until the appearance of WINCKELMANN that the subject gained actuality. He was unable to visit Greece, and all he accomplished was by the aid of a few Roman collections. His plan of writing a pamphlet on an archæological subject, and afterwards sending out another in contradiction of his own conclusions, suggests the nebulosity of WINCKELMANN'S theories. With all its shortcomings, his "*Geschichte der Kunst des Alterthums*" worked a revolution. The Italians VISCONTI, LANZI, FEA and GUATTANI were indebted to it. HERDER, GOETHE, MEYER and HIRT could not esteem it more if it had dropped from the sky. ZOEAGA, HEYNE, WELCKER, SICKLER and many more treated it as an oracle. The study of WINCKELMANN'S history formed a bond in common between Germans of all the States who visited Rome. It became, as it were, one of those dominant ideas which rule a world. GOETHE classed WINCKELMANN with COLUMBUS, and described the history as a book for eternity. In the early part of the century a company of famous Germans were collected in Rome whose principal occupation appeared to be the study of WINCKELMANN. From it they were led to STUART and REVETT'S work and DODWELL'S volume on cyclopean remains, and the three enabled them to realise the extent of the ancient world which awaited investigation. When the members returned to

Germany they took care to infuse much of their enthusiasm in other men, and in their native places they created interest in Classic archaeology. If we remember rightly, there was an expedition to Greece as early as 1810. STECKELBERG, LINCKH, RIEPENHAUSEN, KESTNER, NIEBUHR and BUNSEN continued the work of their predecessors. About 1818 the two last united in an archaeological description of Rome. In 1822 GERHARD arrived in the city, and the following year his investigation of the plan of the Basilica Julia may be said to have suggested a new manner of dealing with remains. It is well to know that the Germans in Rome were not narrow-minded. From the first they considered all their studies in Rome, Italy and Greece as having world-wide relations, and they were anxious to have as much co-operation as was possible. GERHARD proposed the creation of an universal journal of archaeology, which was to be written in French in order to appeal to scholars everywhere.

BUNSEN founded the Archæological Institute in Rome towards the close of 1828, but care was taken that there should be no suspicion of partiality. Archæologists of all lands found welcome in its halls. It was directed by GERHARD up to 1837, when he went to Greece to aid in advancing the study of archæology throughout that region. He was succeeded by EMIL BRAUN, whose name is made so familiar to students by his books and the constant references to his authority that they sometimes find it hard to realise that he passed away forty years ago. Alike under Papal, republican and foreign government in Rome, BRAUN contrived that the prosperity of the Institute advanced. As facilities for travelling increased, the crowds of visitors became so large as to be sometimes embarrassing, but BRAUN was good-tempered, and at times appeared as if he was born for a cicerone. There were worse difficulties to be overcome. Occasionally there were outbreaks of international jealousies to be calmed, and officialdom in Germany was sometimes disposed to cavil at the arrangements in Rome, yet BRAUN went straight on undaunted. When he died in 1856, the pestilent Roman fever having overcome a body that was worn out by daily and nightly toil, the Institute had acquired a maturity which Prussia was proud to accept as belonging to itself in a particular manner, and henceforth the Roman Institute of Archæology was as much of a Government department as one of the barracks in Berlin.

Then the advantage of having statesmen like HUMBOLDT and BUNSEN among the original organisers was apparent. It was not merely the promotion of archæological knowledge which was sought after. Everything was directed towards insuring the supremacy of Germany in one important sphere of thought, and the supremacy of Prussia among all the German States. In Rome the first acts were performed of that drama which was to be concluded amidst salvoes of cannon at Versailles. Throughout all the scenes there was the same patient, far-seeing diplomacy to be witnessed.

But while political ends were sought there was no neglect of archæology. It would require more than one volume to explain the relations between the Roman Institute and the German Universities. Every student of literature, language, art, history, or any subject which takes the past in however slight a measure into its purview, feels there is an obligation on him to contribute something towards the store of knowledge which is to be found in the records of the Institute. To all who wish to find subjects to investigate the Institute is prepared to become a guide, and a man cannot claim the least consideration as an archæologist in Germany unless he can produce evidence that he has co-operated in some of its manifold operations. Wherever there is a college in any of the German towns a student can learn much about archæology, but it is only in Rome the seal can be placed on his knowledge.

To carry out the operations it is necessary to convince the authorities in all lands about the superiority of the German system. Within the last year or two we have had in England an example of how that can be accomplished. The inquiry about the Roman wall in the North of England and Scotland may be said to have been conducted by two military archæologists from Germany. The local archæologists who were most familiar with the remains of the old defence could not help concluding that their knowledge

was of a partial kind when compared with that of the visitors, who might easily be imagined to have been engaged in the Roman war department under HADRIAN, and to understand what differentiated the British line of defence from those in other parts of the Empire. If a question arose about repairing a part of the wall in Westmorland, the County Council would probably consider it an advantage to have the benefit of the advice of the German officers. The reasons which have inspired the Greek Government when they sought in Berlin for an architect to overhaul the Parthenon would undoubtedly be no less applicable in the North of England, and much can be said in favour of them. At all events, we must not be surprised at the action of the Greeks. Like many other people, they have been impressed with the breadth of the archæological studies of the Germans. The explorations which have been attempted in Greece have given opportunities to observe differences in the methods employed by several races, and if the conclusion is come to that the Germans are more thorough in their undertakings, it is one for which there are precedents in other divisions of knowledge besides archæology.

THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair.

The following gentlemen were elected members:—Messrs. L. D. Philpot, F. J. O. Smith, H. A. Chapman, C. Bree, G. B. Carvill, P. W. Cleave, J. S. Dunn, J. R. Ireson, C. Martin, A. Smithers, E. W. Allfrey, G. Bailey, N. C. Bathurst, T. Bee, A. R. Carey, E. F. Cobb, C. F. Dowson, R. E. Eddison, C. H. R. Hide, E. T. Marriott, C. H. Fowler, H. Mennie, R. J. A. Shield, R. S. Balfour, P. R. Bradford, H. R. Creighton, V. Esch, F. V. Forrest, G. T. Forrest, S. J. Halse, E. C. Haskins, E. W. Hobkirk, A. G. Pite, E. W. Pugh, F. C. Thomson and S. Towse.

Mr. KEITH D. YOUNG then read the following paper on

The Sanitation of Hospitals and Infirmaries.

The question will no doubt have occurred to many of you, What is there in the sanitary conditions of a hospital which so differentiates it from an ordinary dwelling-house as to render it necessary or desirable to treat it as a subject in itself? The essentials of sanitation, a clean and dry site, substantial and dry walls, a roof that is weather-tight, and drainage and plumbing arrangements of sound construction and properly devised—surely these are as necessary to the smallest cottage as to the largest hospital. This is all perfectly true; but there are conditions affecting the health of the inmates of a hospital which are to be found in no other kind of building, and which lie at the root of all questions of hospital sanitation.

In the first place, then, it is essential that we should have a clear understanding of what a hospital is. Simple as this may appear, it is, nevertheless, the very root of the whole matter.

For our purpose to-night it will suffice if we divide hospitals into two classes:—1st, those which exist for the benefit of the patients; and 2nd, those which exist for the protection of the community. In the first class are comprised all those hospitals known broadly as general hospitals, including also the majority of special hospitals; and, in the second, hospitals for the treatment of infectious fevers.

In the first-class, then, we have a group of buildings which are devoted to the treatment of sick and injured poor—eleemosynary establishments, the first and most important function of which is charity. In these hospitals a large number of patients are gathered together, very often literally under one roof. Without such a grouping of large numbers of patients in one building or one group of buildings, it would be impossible to extend the benefits of medical and surgical relief to anything like the numbers of patients needing help, and as it is, the struggle for existence is, as you possibly know, hard enough. But the point to which I wish to draw your attention is this—that it is not to the advantage of the patients that they should be congregated together in large buildings or in large wards; but, on the contrary, this very fact is an element of grave danger to the patients themselves. To put the matter plainly, the ideal hospital is one in which each patient should be treated in a ward by himself, entirely cut off from all possibility of aerial connection with any other ward. This is, of course, an economic impossibility, and it is the function of hospital sanitation to combat the dangers involved by the necessity of grouping large numbers of sick together.

I cannot do better than quote to you words written just thirty years ago by Sir John Simon in a report on hospital hygiene to the Privy Council:—

"The rules of hospital hygiene are," he says, "in principle

simple enough. That which makes the healthiest house makes likewise the healthiest hospital—the same fastidious and universal cleanliness, the same never-ceasing vigilance against the thousand forms in which dirt may disguise itself, in air and soil and water, in walls and floors and ceilings, in dress and bedding and furniture, in pots and pans and pails, in sinks and drains and dustbins. It is but the same principle of management, but with immeasurably greater vigilance and skill, for the establishment which has to be kept in such exquisite perfection of cleanliness is an establishment which never rests from fouling itself; nor are there any products of its foulness—not even the least odorous of such products—which ought not to be regarded as poisons.”

To illustrate the truths of these propositions I will take two examples of hospitals which may serve as subject-lessons in hospital hygiene.

My first example is the famous old Hôtel Dieu at Paris; often as this remarkable, I might almost say unique, building has been described, I think the lessons to be learnt from its history are so valuable that I need not apologise for bringing it to your notice this evening.

I have here a plan of one floor of part of the Hôtel Dieu as it existed at the latter end of the eighteenth century. Howard, who visited this hospital in the year 1783, says of it and its auxiliary, the Hospital of St. Louis, that “they are the two worst hospitals I have ever visited. They were so crowded that formerly I have often seen five or six in one bed, and some of them dying.” Tenon, whose memoir on the hospitals of Paris was published in 1758, says, “In the middle are placed the most infectious departments, such as clothes stores, mortuaries, dissecting-rooms; they (*i.e.* the patients) are contained in four or five floors of wards joined together and without ventilation, wards surrounded by rooms for the staff which cool and shade them; where the staircases are insufficient; where the sole and only promenade is a place encumbered with drying-grounds and linen in course of evaporation; a monstrous pile, more fit to prolong sickness, to destroy, than to re-establish and preserve health.”

Look for a moment at the plan, with the vast ward running the whole length of the building, and containing 168 beds, of which 118 were for four patients each, giving a grand total of 572 patients, and then note that on the south side there are no windows at all, whilst on the north the windows must nearly all have had their eills above the ceilings of the adjacent rooms. This sort of thing was repeated on three upper floors with slight variations, and in addition to this building there were other wards on the opposite bank of the Seine, and on one of the bridges connecting the two sides.

The latrines were in close proximity to the wards, were insufficient in number, and are described by M. Tenon as masses of ordure, and the extent to which infection must penetrate the wards as inexpressible. Within the walls of this vast pest-house were gathered not only ordinary sick, but patients suffering from infectious and contagious diseases of all sorts, lying in women and lunatics. And the immediate result of this state of things was that one patient out of every four died. You have here, then, every defect by which the structure of a hospital can contribute to the destruction rather than the preservation of life.

My second example is the old Lincoln County Hospital. I have chosen this in order that I may contrast with it the building which replaced it, and which is still one of the best examples, twenty years old though it be, of a good county hospital.

In 1863, when this hospital was inspected by Mr. Timothy Holmes, he found that in consequence of a severe outbreak of erysipelas and other septic diseases, certain alterations had been made in the structure and its drainage, which, it was hoped, would remedy the evils referred to. The hospital itself he describes as a building of irregular structure, a great part of it being nearly a century old. Like most hospitals of that period it was “composed of small wards not so much ill-provided with window space as having their windows improvidently placed for hospital purposes, the windows being wide and low, and at one or at two contiguous ends of the ward, so that it became necessary to crowd the beds together away from the windows.” He notes also that in the older part of the hospital the floors were of plaster, than which a worse material for the purpose can scarcely be imagined. The hopes for the better future of the hospital expressed in Mr. Holmes’s report were doomed to disappointment, for in succeeding years the recurrence of pyæmia became so persistent that it was obvious that nothing short of demolition would suffice to root out the evil. Here again, there can be no doubt that the structure itself was to blame. The number of small ill-ventilated wards, all in intimate air connection with one another, was at the root of the difficulty. Septic disease does not spread about a hospital if the wards are properly separated one from the other and efficiently ventilated.

Contrast this with the plan of the present hospital, the work of my friend, Mr. Alexander Graham. Note the long and

narrow wards, each bed with its proper complement of light and air, the offices properly disconnected from the wards, the latter from the administrative offices, and the laundry and mortuary duly isolated from every other part.

Let us now take in order the various points which I have mentioned as tending to aggravate and intensify the necessary processes of fouling which must go on in all hospitals.

Insufficiency of air-space and insufficient ventilation are closely allied, and must be considered together. Air-space, indeed, is of little value by itself unless it is accompanied by ample means of ventilation. And by air-space I mean not only cubic space but floor space—a most important point to note. It is useless to supply your patients with a generous amount of cubic space unless you first see that they have sufficient floor area. Of the importance of free ventilation the experience of great wars is of the utmost value. A very striking case occurred during the Franco-German war—I believe in Paris—where it happened that a church and a slaughter-house were about the same time converted into wards for the reception of wounded soldiers. In the church gangrene broke out, and the mortality among the men was very heavy. In the slaughter-house, although the cubic space was many times less per man than in the church, the cases did well and septic disease was not seen.

The essential point of difference in the two buildings was this. The church was a solid building with windows high up in the walls and very little means of ventilation, whilst the slaughter-house was a mere shed, with louvre-boarded sides, freely swept with air from end to end. This point is further illustrated by the experience of hut hospitals, as compared with wards improvised in permanent buildings, as far back as the Crimean War and in the Civil War in America, which led many experienced surgeons to the conclusion that hospitals should always be temporary structures which should be destroyed at frequent intervals.

The question of ventilation cannot be considered apart from that of warming. The two are interdependent and cannot be separated.

Ventilation, then, means the supply of fresh air, warmed to the requisite temperature, and in sufficient volume to preserve a given standard of purity without producing draughts. The rule generally adopted in practice is that each patient should have a supply of 3,000 cubic feet of air per hour. This amount is requisite in order that the total impurity of the air may not exceed 6 per 1,000. To accomplish this without draught, the air of the ward should be changed not oftener than three times per hour, which gives a minimum allowance of cubic space of 1,000 feet per head. It is very difficult to lay down any fixed rules for determining the necessary allowance of cubic space. The nature of the disease treated and the situation of the hospital must be taken into consideration.

In a country hospital, where the cases are for the most part of a mild or chronic nature and the site is open, 1,000 feet may often suffice. Where the average of acute cases is greater and a hospital is in the centre of a big town, more cubic space is required; and in hospitals in manufacturing towns where severe surgical cases are frequent, I think 2,000 feet is not excessive. The tendency to draft off patients to convalescent hospitals as soon as they are fit to be removed, and so to keep the wards full of acute cases, is an element that must be taken into consideration nowadays.

Ventilation is commonly divided into two classes—natural ventilation and mechanical or artificial ventilation. In natural ventilation the agency of windows and other openings, aided by the upcast power of the smoke-flues from open grates is relied upon. In artificial ventilation the air is either pumped in by mechanical appliances and allowed to escape through openings or shafts constructed for the purpose, or it is sucked out either by fans or by the aspirating power of heated shafts. In either case the air must be warmed before it enters the ward.

It would be impossible for me to describe the many systems which have been devised for the ventilation of wards by mechanical means in the time we have at our disposal this evening. The object, however, of each is practically the same, namely, to insure a regular and automatic change of air in the ward by mechanical means, altogether independent of windows.

The question which concerns us is this, Is there any evidence to prove that wards cannot be kept sufficiently sweet and healthy without recourse to expensive automatic appliances? So far as the experience of hospitals in this country goes, I think that not only is there no such evidence, but that there is some very definite evidence in support of the exact converse. There is a case cited by Dr. Bristowe and Mr. Holmes in the report to which I have before alluded, which goes to prove that mechanical ventilation can become a positive evil. I allude to the York County Hospital, which, when it was erected, was furnished with an apparatus for warming and ventilating by a mechanical process, by which the air was warmed in the basement and driven into the wards by the aid of a steam-engine, the vitiated air being carried off by shafts

warmed by hot pipes. The wards were not provided with fireplaces, and the windows were mere apertures for light, and were not made to open. This system remained in work for nine years. During that time it was said that the wards were always close, sickly and even offensive; and erysipelas increased to such an extent and proved so often fatal, that the surgeons gave up operating altogether, preferring to abandon their patients to disease rather than risk operations with almost certainly fatal results. The system was abandoned, fireplaces constructed and windows made to open. When this was done erysipelas disappeared and the health of the hospital became what it ought to be.

No doubt in this case the apparatus itself was deficient. I give the case for what it is worth; but it is not without its value, if only to show how mischievous such a system can be if improperly devised.

To return to our question, Is artificial ventilation necessary? To prove that it is necessary we must assume that the ordinary means of ventilating by open windows is inadequate. Now, I venture to affirm that there is no evidence whatever in support of such an assumption. A distinguished Paris surgeon, Dr. Le Fort, in 1862 published a report on "Hospital Hygiene." He there compares the mortality in London hospitals with that of the Paris hospitals, very much to the disadvantage of the latter, and professes himself decidedly in favour of the natural means of ventilation adopted in London to the artificial systems in vogue in some Paris hospitals. But he says one need not go to England to search for means of comparison between the two systems; for the two hospitals in Paris where the mortality is greatest are precisely those in which artificial ventilation is employed. And this, remember, was at a time when antiseptic treatment was unknown, and the paramount importance of cleanliness was not recognised as it is to-day.

The matter appears to me to be very fairly stated by Sir Douglas Galton in his book on "Hospital Construction." "The system of propulsion for hospital ventilation (he writes) has not found general favour with hospital architects or managers in this country. There is one very patent and valid reason, which is that in this climate windows can be kept open; and when windows are open the volume of fresh air which passes through a ward will be at least twenty times greater than either the theoretical 3 000 cubic feet per hour, or even the 5,000 or 6,000 cubic feet, which some of these systems profess to furnish, without entailing the large expenditure of fuel necessary for moving a large volume of air."

So, also, Dr. Bristowe and Mr. Holmes, in the report to which I have already alluded. "No amount of cubic feet of space, no plan of building, no artificial system, no combination of these adjuncts to a good ventilation has ever been found to replace open doors, windows and fireplaces, while provided with the latter, which are the essentials of good ventilation, many old crowded defective hospitals have maintained for a long series of years an amount of success which the most eminent examples of scientific construction have never found practicable."

Every one who has any experience of hospitals in this country knows that there are very few days in the year during which ward windows cannot be kept open; and I cannot think it justifiable for the sake of those few days to establish a complicated system, involving a certain amount of skilled labour in working and considerable cost for maintenance; a system, moreover, which must involve the construction of a number of shafts, all of which, unless kept scrupulously clean, must become harbours for filth and a constant menace to the health of the patients.

If I were to presume to lay down rules for the proper method of warming and ventilating a ward, I should say apply your warmth, or the greater part of it, around the outside walls of the ward where the greatest leakage takes place; whether the method be by steam or hot water, take care that every pipe or coil is so placed that it can be cleaned easily and all round. If any arrangement is made for the admission of fresh air at the back of a coil, see that the shaft can be readily got at and cleaned, and let no shaft for the passage of air be longer than the thickness of the outside wall.

Before I leave this subject of ventilation there is one special point it is necessary to notice. This is the sterilisation of air from fever wards. There is one kind of fever, and one only, of which it can be said that the sterilisation of air expelled from the wards is necessary in the interests of public health, and that is small-pox, a disease of which we have convincing proof that it can and does spread beyond the walls of the hospital; that the specific infection of it is in fact air-borne. And for this reason it is distinctly desirable that some means should be devised for rendering innocuous the air from the wards. The nearest approach to the accomplishment of this task has been made at the Bradford Corporation Hospital, where, under the direction of the architects, Messrs. Morley & Woodhouse, an apparatus has been constructed and since patented by Mr. Edward Oldroyd. The system, to describe it very briefly, is this. Fresh air, capable of being warmed when necessary by

passing over hot-water pipes, is admitted to the wards in the floor at the foot of each bed, and also at certain points in the opposite wall. The whole of the vitiated air is drawn from the ward through openings at the ceiling level into a trench, at one end of which is a powerful furnace; part of this air is used to promote the combustion of the fire, the remainder being passed through the furnace and exposed to a temperature estimated to be 800 degs. Fahr. All the windows in the ward are hermetically sealed. For sufficient reasons I am not able to put before you any statistics as to the success of this system. The proof of success in an appliance of this kind is a matter for the bacteriologists and the microscope; and we have yet to see whether a ward constructed after this fashion fulfils every requirement, not only of the sterilisation of the air, but also as a suitable place for the treatment of small-pox. The point, however, I wish to impress upon you is that there is no justification whatever for applying such a system as this to wards for scarlatina, or any other infectious fever. The fact that scarlatina, the most important of these diseases, does not spread beyond the walls of the ward is well recognised; and this being so, the necessity for any system of sterilisation of air vanishes.

(To be concluded.)

TESSERÆ.

Stereotyped Architecture.

WHEN we reflect upon the many and great changes which not only two or three thousand years, but even the lapse of a single century, will effect in the condition and circumstances of society, it is by no means surprising that in an art, the excellence of which from age to age is so largely affected by these ever-varying contingencies, that that which is justly entitled to the palm of excellence in one age or country, should be found totally inefficient and inconsistent in another. The architects of ancient Egypt, for example, found the required sites for their temples exposed to frequent inundations from the annual overflowings of the Nile. Hence the massive and broadly spreading bases which gave solidity; and, under such circumstances, imparted effective beauty to their structures. The originators of the Grecian architectures, on the contrary, had very high and dry and hot situations to adapt their arrangements to; and as rain seldom falls in Greece they were enabled to dispense with windows or other means of light and ventilation to their temples, by leaving large central openings in the roof. The purpose of their porticos and colonnades, in addition to presenting a grand and imposing relief to the monotony of bare and unperforated walls, was unquestionably to protect the edifice and its congregations from the piercing effects of the sun, which on a naked rock of some hundred feet above the common level, and in a climate such as that of Athens, is peculiarly oppressive. The ancient Romans also, together with the modern Italians as well as the originators of Gothic architecture, claim—certainly in different degrees but nevertheless justly claim—the merit of adapting their successive modifications of the art of construction to the altered circumstances of the times and to differences of climate as well as to differences of materials. And how, it may be asked, can we in the nineteenth century really imitate the example of these ancients but by striving to do not what they did—but by the actual and servile copying of their forms—but as they did, by the invention and working out of forms and arrangements adapted to the different character of our own climate and the altered condition of our own times? So long as adherence to antique forms is persisted in, it is utterly impossible that architecture can be brought to any satisfactory result in England and Europe generally, the very nature and character of these forms being totally at variance with many of the most prominent and essential arrangements of modern society.

Leonardo da Vinci.

Viewing Da Vinci as a philosophic student, as a votary of pleasure, as an athletic civilian, as an aspiring artist, or as a man of Catholic tastes and boundless capacities, we must ever regard him as a splendid phenomenon. And a phenomenon he unquestionably was, if for nothing else for the dazzling but harmonious contradictions of his character. Perhaps no other man, either before or since, ever combined so intimately and yet with such an exquisite preservation of individuality the incongruous attributes of the natural and the artificial. Such was his appreciation of the purely natural that he could paint a blossom spangled with the dew of morning (as he has done in one of his Madonnas), so that you would mistake for a reality both bloom and moisture. Yet he disdained not to participate in the frivolities of fashion and the coteries; he could dally over a brodered glove, and discern beauties in the texture of a jewelled tissue. Osric might have found sympathy in him for all the punctilios of etiquette, and yet he might have lamented for the flowers of Proserpine with an

earnest tenderness like that of Perdita. His whole soul was a living antithesis of predilections—verging in one direction towards the city and the palace, and in another towards the woods and the wilderness—singing pæans to the society of the gay and the *débonnaire* with Catullus, and exclaiming, in his rapt admiration of nature, as the American philosopher has since exclaimed, with a voice awe-stricken and yet exultant—“Every day, the sun; and, after sunset, night and the stars: ever the wind blows; ever the grass grows.” Such was Leonardo when he wandered by the ripples of Fucecchio, or frittered away his leisure in the saloons of Florence. A child, with all the poetry of childhood, when he was in the meadows of Bergamo; he was a gentleman, if not a *petit-maitre*, and a worldling, when mingled amidst the throng of courtiers in the palace of Tuscany. It is this contrariety of sentiment and bearing which imparts so much of zest and fascination to his memory, investing it with the double graces culled from nature and civilisation; it is this which constitutes the originality of his idiosyncrasy, colouring it with a variable splendour of antitheses, like the sheen which fluctuates on the plumage of those oriental birds described by the ornithologist as “damson-hued and silver, according to the variations of light.” And precisely as the light of circumstances shone upon Leonardo’s temperament, were the contrasting shades of that temperament revealed. At a pageant he was a musician or a necromancer; at a conclave an orator or a philosopher. Whenever any one faculty was calculated to be most effective that faculty was at once, by a sort of admirable fatality, developed by the Florentine. Nor did these sudden transformations arise from any inherent inconsistency in his principles; they originated, on the contrary, in the marvellous flexibility and elasticity of his genius—a genius which adapted itself to every emergency, which obeyed every demand, and which only succumbed at last under the pressure of physical prostration.

Manufactures in Brass.

Brass is composed of copper and spelter, varying in its composition according to the purpose to which it is intended to be applied; when melted it runs with facility into sand-moulds; when cast into ingots it can readily be rolled into sheets, drawn into wire, formed into tubes, pressed into the most complicated forms; can be filed and turned, bronzed or cleaned by acids. Moulding is employed to produce the article in its rough state, and may be said to be the first stage of the work; previous to this, however, the pattern has to be made, and if an ornamental one the aid of a designer, modeller and chaser will be required; he first makes a drawing, the second a facsimile in wax, which is cast in lead, and committed to the hands of a chaser, who repairs it, and having a cast made in brass puts in all the details. This is then sent to the moulder, with a box formed in two parts, which he separates, and one-half of which he places with the face downwards upon a board. If the pattern is flat he lays it in, and after riddling sand upon it, fills up the remainder, pressing it hard down. Having scraped off the sand which is not required from the top of the box, and introducing another board, he reverses the same; having dusted the face he places the other half of the box on the top and repeats the operation of filling with sand. This done the two parts are separated, the pattern or model removed, a “gate” made for the introduction of the melted metal. The box is then closed, held together with screws or clamps, and the metal which has been melted in an air furnace and in a clay crucible is poured down into holes of the box, and fills every portion of space left unoccupied, thereby producing a perfect copy of the model. Holes are cast into articles by the introduction of pieces of sand, technically called “cores.” The casting is now placed in the hands of the workman; if round it is turned in the lathe, if square or flat it is filed, if an elaboration of detail, such as leafage, figures, &c., it is rifled and chased up. The appearance of dead gold is given by immersion in acid; the bright portions by means of steel tools or burnishers; and the final touch or operation is the protection from tarnish or oxidation, by means of lac varnish, which is applied with a camel-hair brush, the article having been previously heated. Bronzing is the result of the action of an acid, and its colour or shade is determined by the varnish employed as a protection, the article having previously been brushed up with black lead.

The Pergamene School of Sculpture.

Three lines of Pliny and five of Pausanias constitute the whole of what the ancient writers have to tell us about the school of sculpture of Pergamum. “Many artists,” says Pliny, sculptured the battles of Attalus and Eumenes against the Gauls.” Pausanias tells us of a trophy set up by Attalus I. on the Athenian Acropolis, with representations of the battles of the Gods and Giants and the Athenians and Amazons, of the fight at Marathon, and of his own victory over the Gauls; the figures two cubits high. Until quite recently it was not known that we had sculptures of the Pergamene school, and it was debated whether the *anathema* of Attalus consisted of reliefs or of detached figures. The learned Raoul-Rochette first showed

that the group called Paetus and Arria in the Ludovisi Gallery at Rome represented a Gaul slaying his wife and himself, to save himself and her from captivity, a group which would be a likely subject for a sculptor of the court of Attalus. Then it was seen how similar in style and idea to this group is the figure formerly called the dying gladiator of the Capitol, and now known as the dying Gaul. Professor Heinrich Brunn made a special study of these sculptures, and was able from them alone to form some idea of the Pergamene style of sculpture. Then by the light of that knowledge he advanced to a most brilliant and happy discovery. He found in several of the museums of Europe—at Venice, Naples, the Vatican, the Louvre—small statues of overthrown and wounded combatants. The style of these sculptures is the free and advanced style of the period after Alexander, their size corresponds with the words of Pausanias, their treatment is like the treatment of the dying Gaul of the Capitol. Putting all these detached statues together, some of which had failed to attract attention, while others had been pronounced modern, Professor Brunn was able to prove that we have in them remains of the groups of combatants from the trophy of Attalus at Athens, and even representatives of the defeated party in every group, of Giants, Amazons, Persians and Gauls. When this had once been proved, our knowledge of the history of ancient art received an enormous accession, and a view was given us of the state of art and manners in Asia Minor under the Pergamene princes. If Professor Brunn’s theory required verification like other scientific theories, it would certainly have received it when there were discovered at Pergamum itself, and taken to Berlin, the sculptures of a gigantic altar, sculptures which in style bear the closest likeness to the scattered figures of Giants and Gauls brought together by Brunn.

Mythological Sculpture.

Lord Byron in his “Childe Harold,” describing the Venus de Medicis, asks the goddess whether she appeared in “this guise” to Paris or to “more deeply blessed Anchises,” or to Mars more fortunate still; and then follows a rhapsody about “lava-kisses, melting while they burn,” showered on the cheek of the recumbent war-god. Such a group would hardly have suggested itself to the imagination of a Greek sculptor about to embody a Phedra, and is in strange contrast with the Venus of the Florentine Tribune, that beautiful and passionless impersonation of the morning star. Elaborate blunders in a case of this kind are the less pardonable, because it is especially through the interpretation of Greek art that the several characters of Greek divinities are to be distinguished. We require no allusive attribute, neither quivered shoulder nor crescented brow to recognise a Dian in those feet, firm and alert, though for the moment arrested, that slender but sinewy form, and above all, the far-projected Apollonian glance clear as the beams of the sister luminary embodied. With the form, equally girlish but simply joyous and blameless, of a Hebe or a Grace, such a divinity was almost as strikingly contrasted as with a Pallas, a goddess chaste as the Huntress that outsped the shafts of Love, but chaste from the collected sternness of self-sufficing strength and from the high wisdom, confederate with virtue, which subdued the presuming with its Gorgon and presided over every industrious art. The character of a Venus was expressed not less plainly in early ages of art by the union of perfect beauty with a reserve and sacredness which belongs to the maternal relation, and in later by the languishing and humid eye, the lips enwreathed with smiles and dubious look, the narrow shoulders, the marvellously-moulded form, slightly developed and yet luxuriant, in which numberless and incalculable curves were lost in one another, and finally by the slender feet and the tread, at once confiding and insecure, apparently accustomed to a more unstable element than earth. The genius of a nation’s poetry will ever be exhibited in its other arts—at least, in those it cultivates, as the latent spirit of its philosophy is disclosed in its laws.

The Chemistry of Oil-Painting.

The study of the attractions already fully developed in pictures painted within the last hundred years only, and their comparison with the works of the old masters, would suggest the following rules for the process of painting:—(1) The oil should in all colours be reduced to a minimum and under no form should more of it than absolutely necessary be introduced into a picture. (2) All transparent colours which dry very slowly should be ground not with oil at all, but with a resinous vehicle. (3) No colour should be put on any part of a picture which is not yet perfectly dry; and above all, never a quick-drying colour upon a slowly-drying one which is not yet perfectly dry. (4) White and other quick-drying opaque colours may be put on quickly. On the contrary, transparent and slowly-drying colours should always be put on in thin layers. If the effect of a thick layer of these latter is required it must be produced by laying one thin layer over another, taking care to have one completely dry before the next is laid on. If transparent colours are mixed with sufficient quantity of white lead they may be treated like opaque ones.

NOTES AND COMMENTS.

ON Saturday last the cemetery of Père-Lachaise was enriched by the costly monument which is the memorial of the late M. BARBEDIEENNE, a founder, who did more than any of his contemporaries to popularise sculpture. The bronzes which he had produced were taken from the antique Renaissance examples, as well as from the best works of the modern French sculptors, and by the aid of the process devised by ACHILLE COLLAS were reproduced with the utmost fidelity. Cheaper bronzes than BARBEDIEENNE'S are to be easily obtained in Paris, and, judging by what takes place in international exhibitions, they are preferred on that account by princes and nobles, but for all amateurs who are worthy of the name BARBEDIEENNE'S series is the most satisfactory. Although the numerous reductions have given character to the house, it must not be supposed that BARBEDIEENNE'S operations were restricted to them. Many of the largest bronze statues in France and other countries came from his foundry, and at the time of the siege he produced a great many cannon. Decorative bronzes, such as lustres, clocks, girandoles, &c., were also manufactured, and the style was always faultless, one reason being the constant employment of an architect among the superintendents of the firm.

As many of our readers are aware, the pavement of the cathedral at Amiens has for years continued in a most defective condition. Partial repairs would be of little advantage, and the cost of a general repaving, which would be at least 4,000*l.*, has hitherto scared the authorities. The latter work is at length to be undertaken during the winter. The Bishop of the diocese has obtained contributions from several individuals, and the Government have consented to give a grant in aid. The stone employed will be "grès de Marquise" and "grès de Belgique." The paving will be a tedious operation, especially as it is intended to reproduce all the memorial inscriptions which are found on the broken slabs.

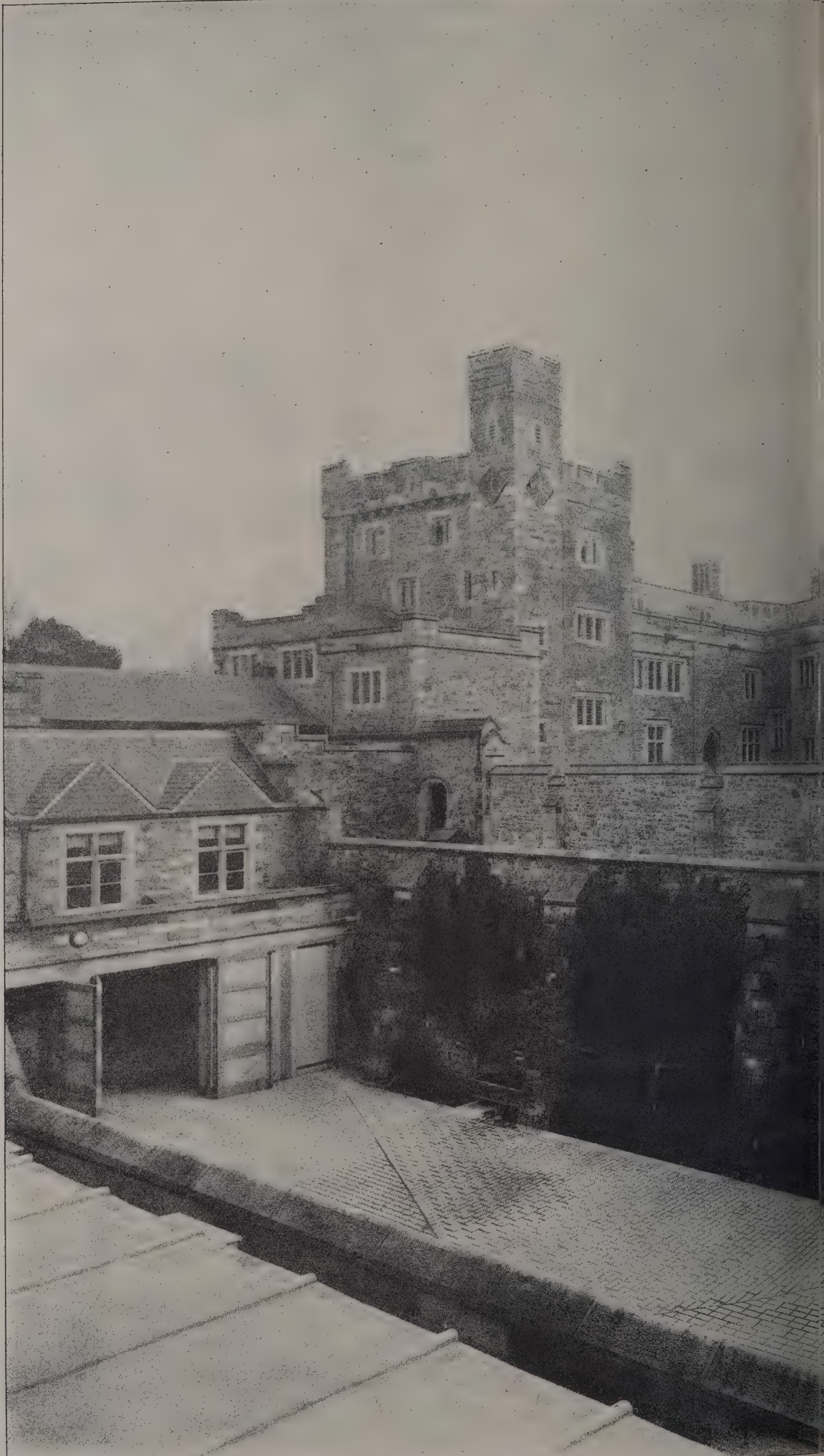
THE excavation of the Parliament Hill tumulus has been as unprofitable as many other undertakings of the County Council, and we hope the result will convey the lesson that interference with ancient things is not always advantageous. At Highgate the outlay fortunately was moderate, for Mr. C. H. READ, who directed the excavations, is not to be paid. His conclusions about the tumulus are as follows:—(a) That it is without question an artificial mound, raised at a spot where there was originally a slight rise in the ground. (b) That a great quantity of additional material was added to it, chiefly on the northern and eastern sides, and probably within the last two centuries. (c) That the tumulus has not been opened before. (d) That it is very probably an ancient British burial mound of the early Bronze period, and therefore centuries before the Christian era. The burial was probably by inhumation, and the bones have entirely disappeared—a circumstance by no means uncommon. Canon GREENWELL, who has directed several operations of a similar class, agrees with Mr. READ. The origin of the name Parliament Hill, or, as some people designate it, Traitors' Hill, seems to be as far as ever from discovery.

FATE seems to be inimical to the erection of a statue of BALZAC, the novelist, in Paris. It will be remembered that when the project was announced there was only a tardy and illiberal response, for the sum received amounted to only 26,000 francs. A further sum of 10,000 francs was promised when the statue was set up. The whole arrangements were entrusted to the Société des Gens de Lettres. They confided the commission, in October, 1888, to M. CHAPU, the sculptor, and allowed him 5,000 francs on account. He promised to deliver the work in eighteen months. M. CHAPU fell ill, and when he died, in April, 1891, the model could not be utilised. The Société gave another thousand francs to his family as a sort of compensation for withdrawing the commission. M. RODIN was next selected, who received 5,000 francs with the commission and engaged to deliver the statue in eighteen months—that is, on January 6, 1893. Another instalment of 5,000 francs was granted when applied for. M. RODIN in due course submitted a model

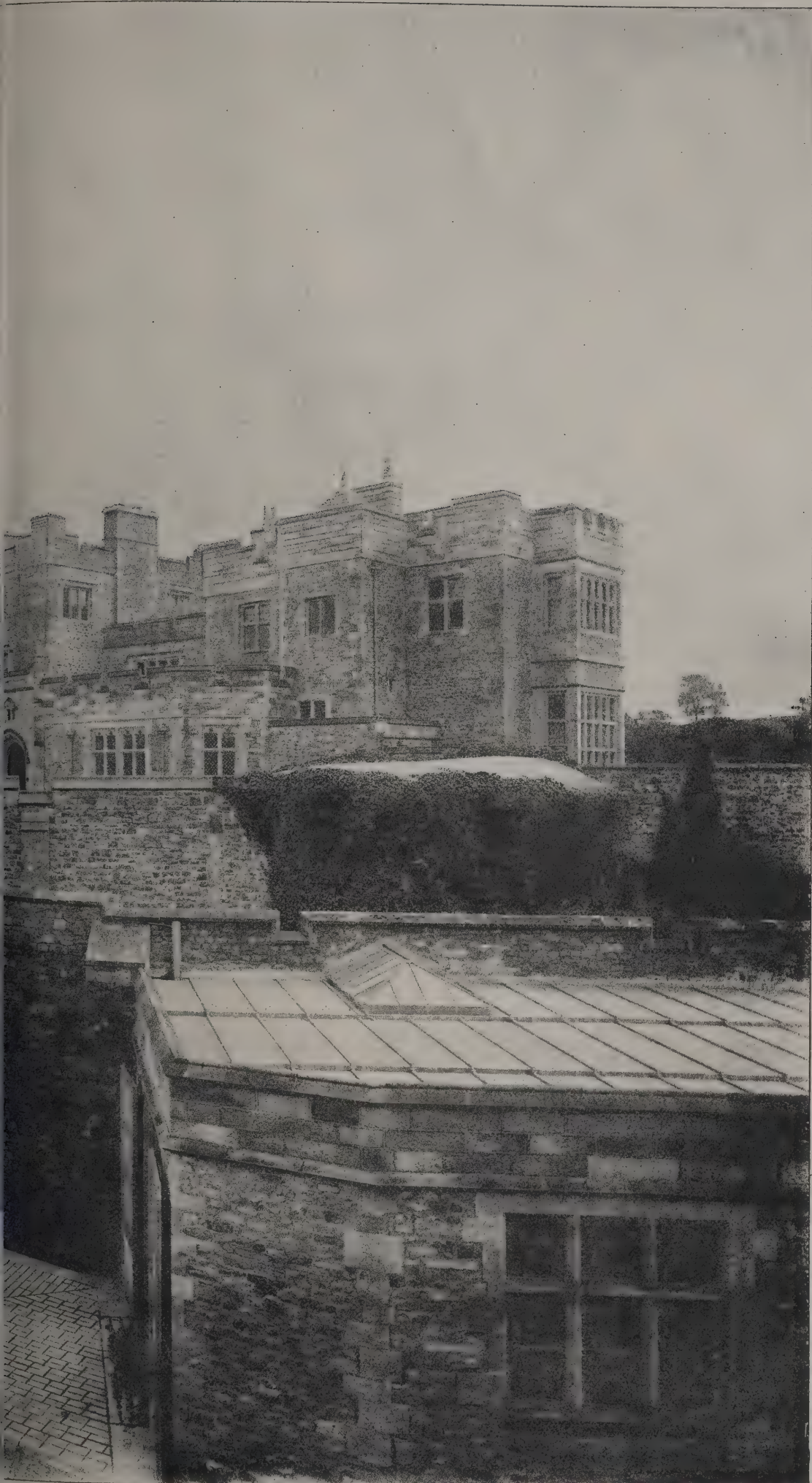
which was not considered satisfactory. He is a realist, and as BALZAC'S figure was not of a heroic sort, being rotund and heavy, it would be contrary to the sculptor's principles to represent the novelist as a sort of APOLLO. The members of the Société were disappointed. M. RODIN endeavoured to alter his model, but as his theory of art was at stake he could not go far. In seeking M. RODIN, it was natural to suppose that what was desired was a portrait of BALZAC as he appeared to his contemporaries, and not an attempt to create an ideal. The sculptor was not satisfied with his changes, and in the hope that time might bring a solution he asked for a postponement until the middle of 1895. The Société acceded, but on condition that M. RODIN returned the 10,000 francs. The sculptor had no objection, but some of his friends have persuaded him that the demand was unwarranted, and must not be complied with unless under conditions which will give a litigious character to the transaction. What may happen nobody can foresee. The case almost corresponds with that of the Wellington Memorial. The Société must have known all about M. RODIN'S work, and might easily have imagined the kind of figure he would produce. A sculptor of his eminence cannot be expected to adapt his work to suit all tastes, and accordingly it does not seem worthy on the part of a Society of Authors to imitate the conduct of the late Mr. AYRTON, by considering only the financial aspect of the case.

WITH all their disciplinary power the Germans do not appear to be better able to conduct competitions without failure than we are in England. A case which has just occurred in Mayence exemplifies inherent defects in the system, which, if they are surprising to the people of that pleasant city, are familiar in other places. It was decided to erect an Evangelical church at a cost of 700,000 marks, and as several of the leading ecclesiastical architects in Germany were anxious to obtain the commission, a competition was arranged. The church authorities and their advisers then found themselves in a difficulty. Excellent designs were sent in, but none of them could be carried out for the prescribed sum. Accordingly it was decided that the first prize could not be awarded nor one of the designs adopted. It was proposed to award prizes of 1,500 marks to Professor OTZEN, of Berlin, and Herr KREYSSIG, of Mayence, and to recommend that the designs by Herr SCHWECHTEN, of Berlin, and of Herr SCHWARTZ, of Darmstadt, should be purchased. Herr SCHWECHTEN, however, declined to agree to the proposal, and withdrew his plans. The next act of the church authorities was to write to the three architects, Herren OTZEN, KREYSSIG and SCHWARTZ, asking them if they were prepared to alter their plans to correspond with an outlay of 700,000 marks, and if they could refer to buildings they designed which cost that sum. In other words, they are invited to take part in a second competition for which no prizes are offered.

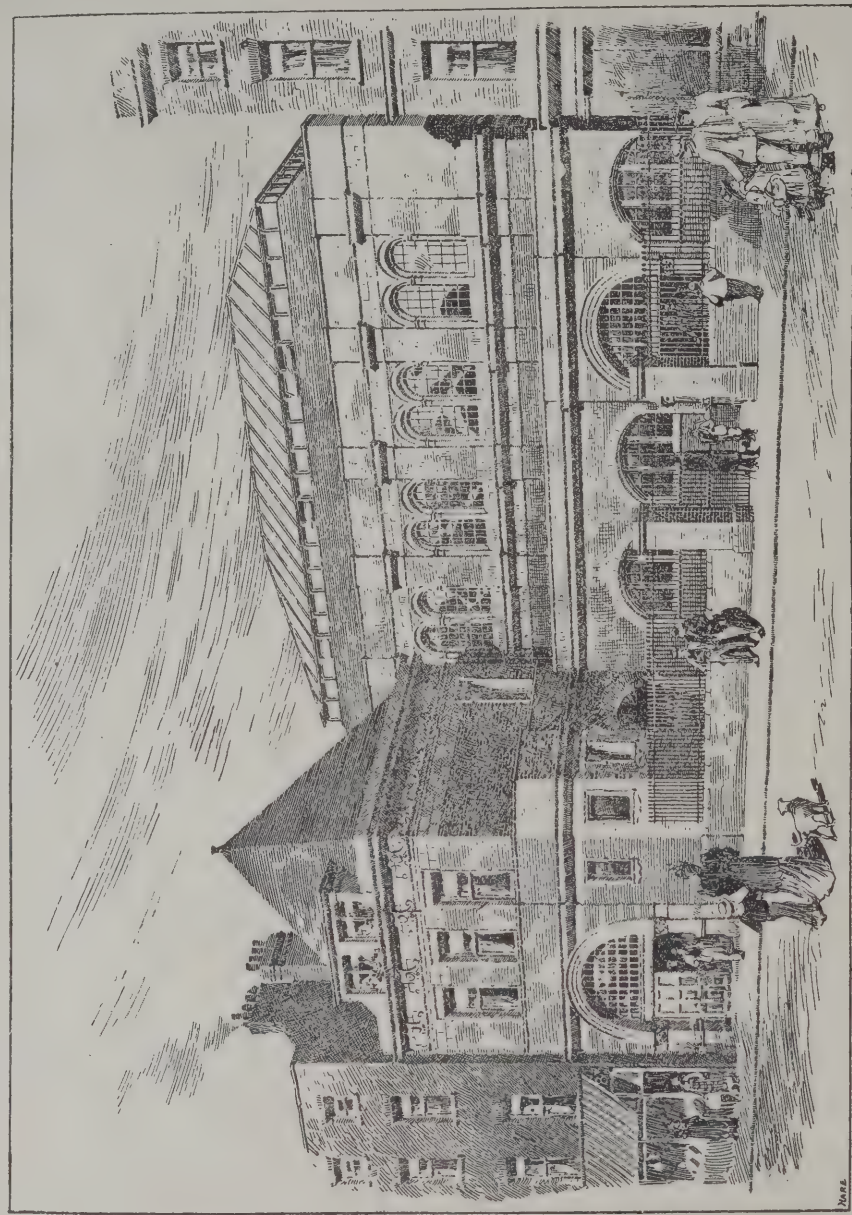
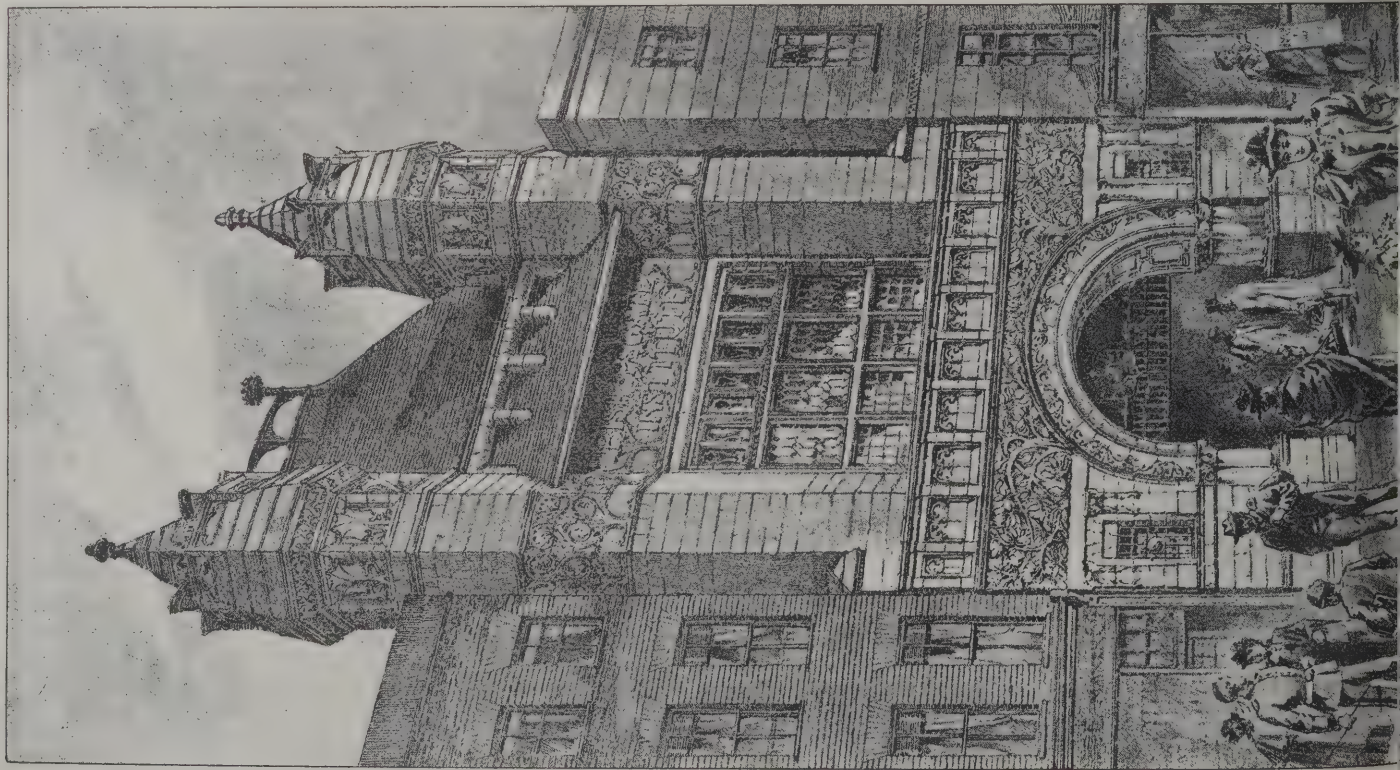
THE late HENRY ROE was only a distiller, and of late years was not one of the wealthiest, but his death deserves respectful record in a journal that treats of architecture. It is not often a man is found who is willing to expend about 200,000*l.* on the restoration of a church which was used by few people. That was Mr. ROE'S claim to recognition. A brewer having expended a large sum on the renewing of one of the Dublin cathedrals, Mr. ROE was incited to undertake a similar obligation for its companion. He acted with more discretion, for while St. Patrick's lost most of its characteristics through the operations which Alderman GUINNESS paid for, Mr. ROE, by entrusting the restoration of Christ Church to the late Mr. STREET, enabled as satisfactory a restoration to be accomplished as was possible. He had also a chapter-house provided, and the buildings form the most picturesque group in Dublin. It is not impossible that Mr. ROE in his zeal over-estimated his own resources. The buildings were scarcely completed, and a costly record of the work brought out, when it was discovered that the withdrawal of such large sums was an embarrassment for his business. Mr. ROE was compelled to make many sacrifices, and he may be allowed the privilege of being numbered among the martyrs for architecture.



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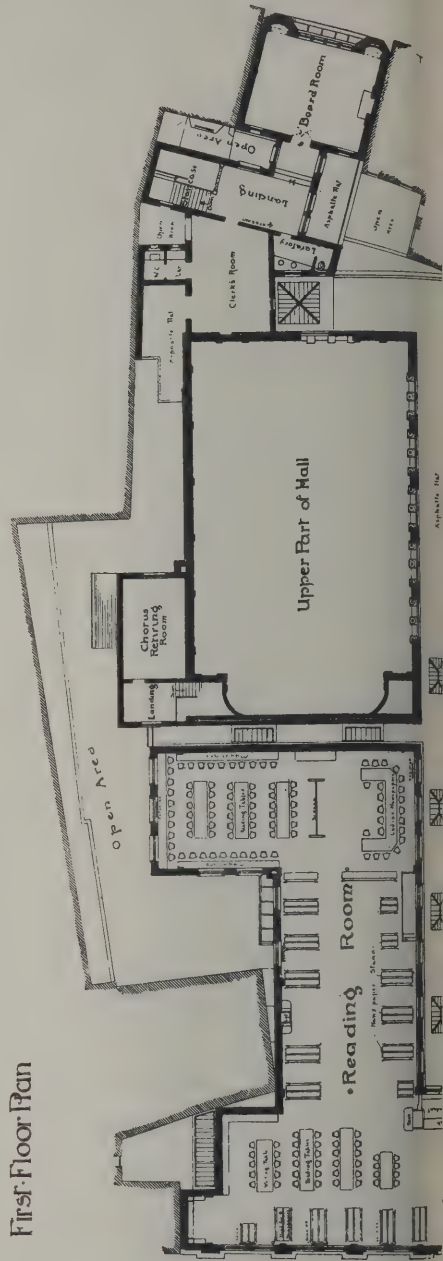


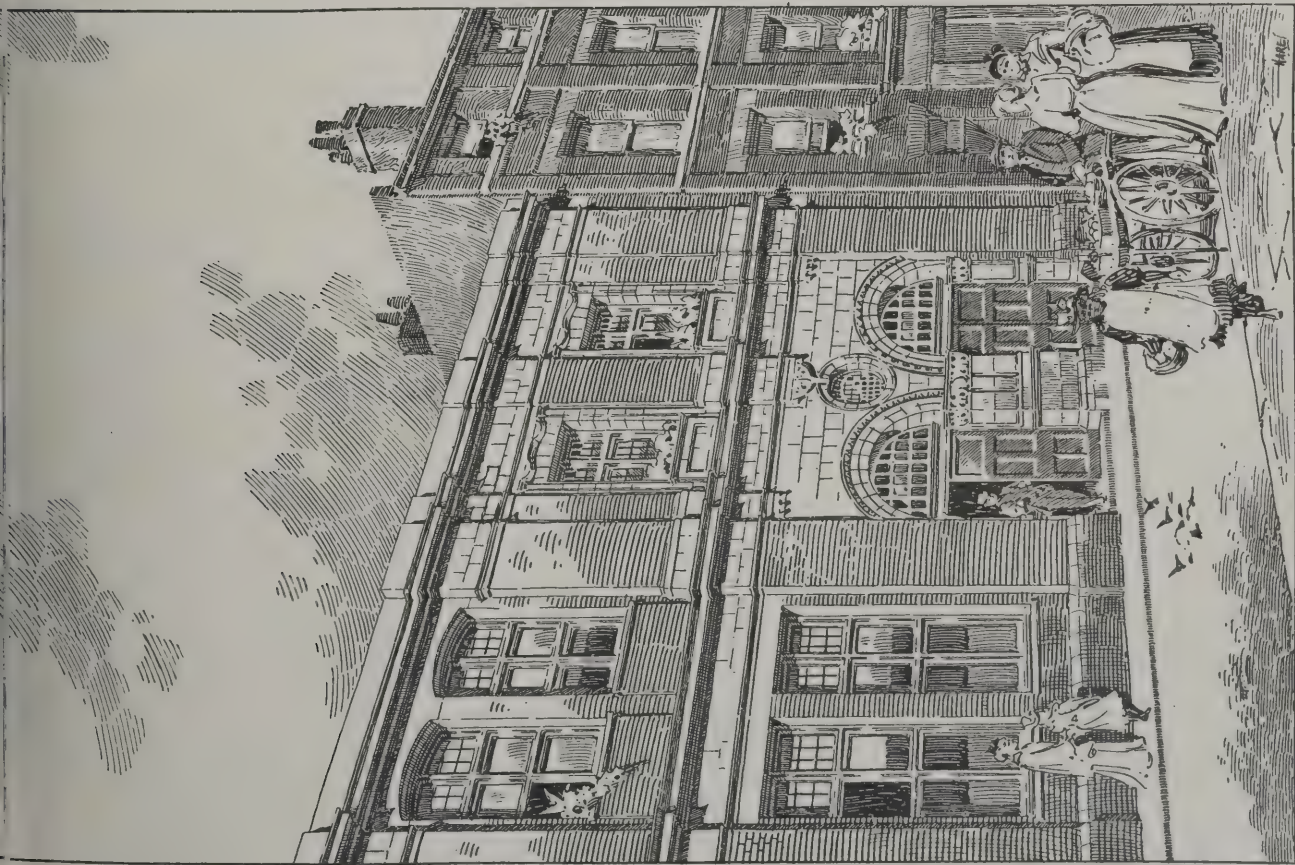
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ENTRANCE IN BRUSHFIELD STREET.

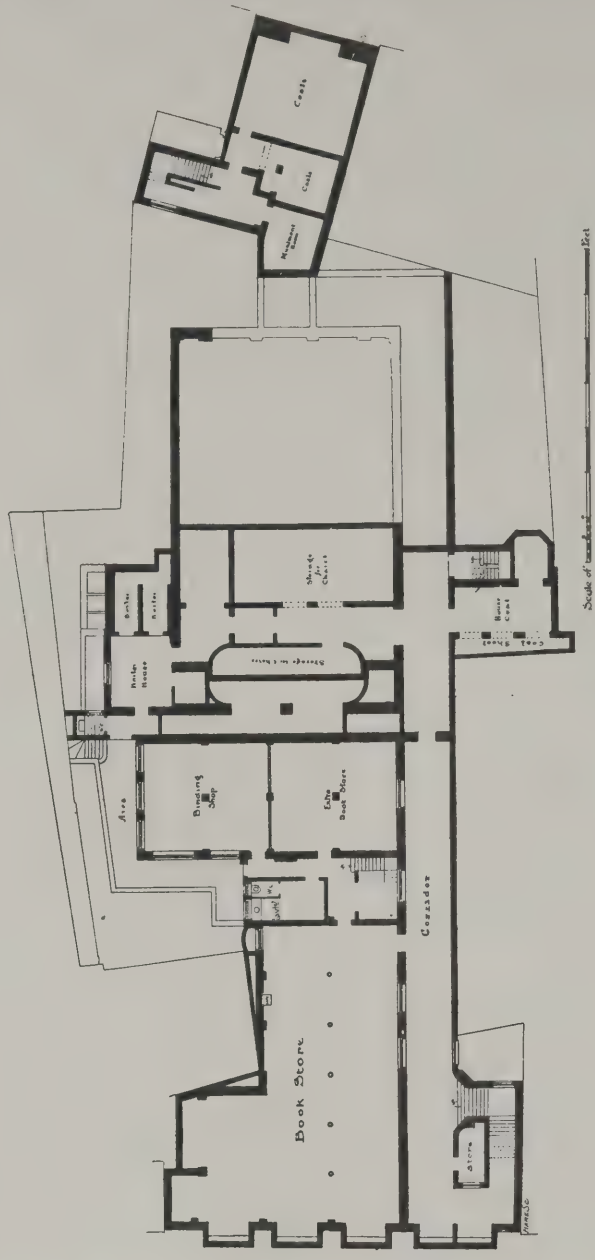
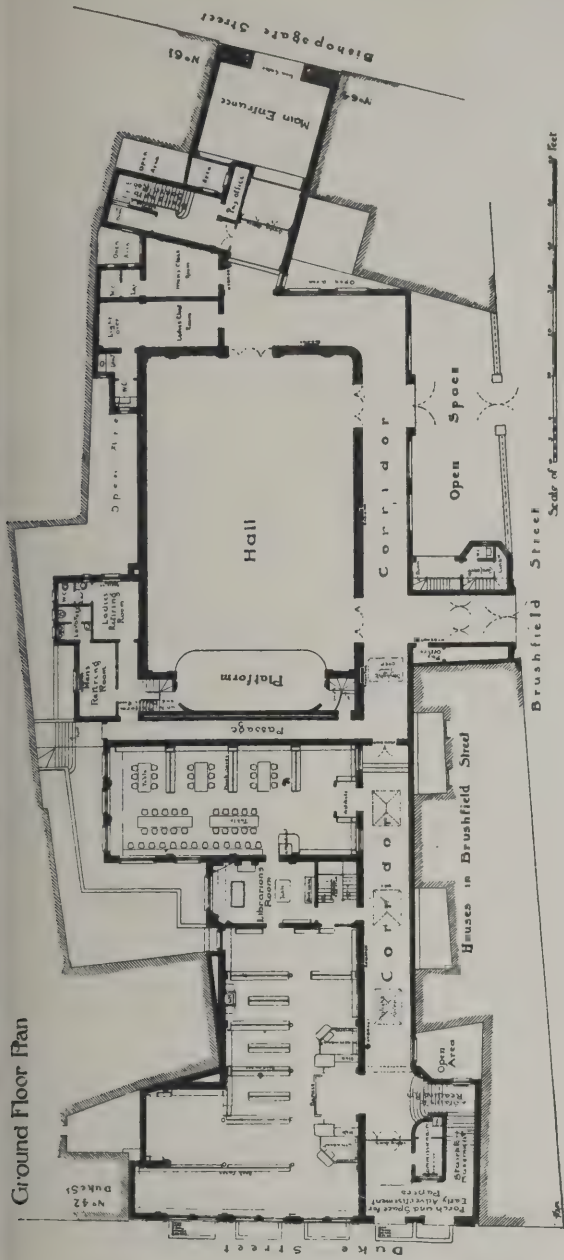
First-Floor Plan



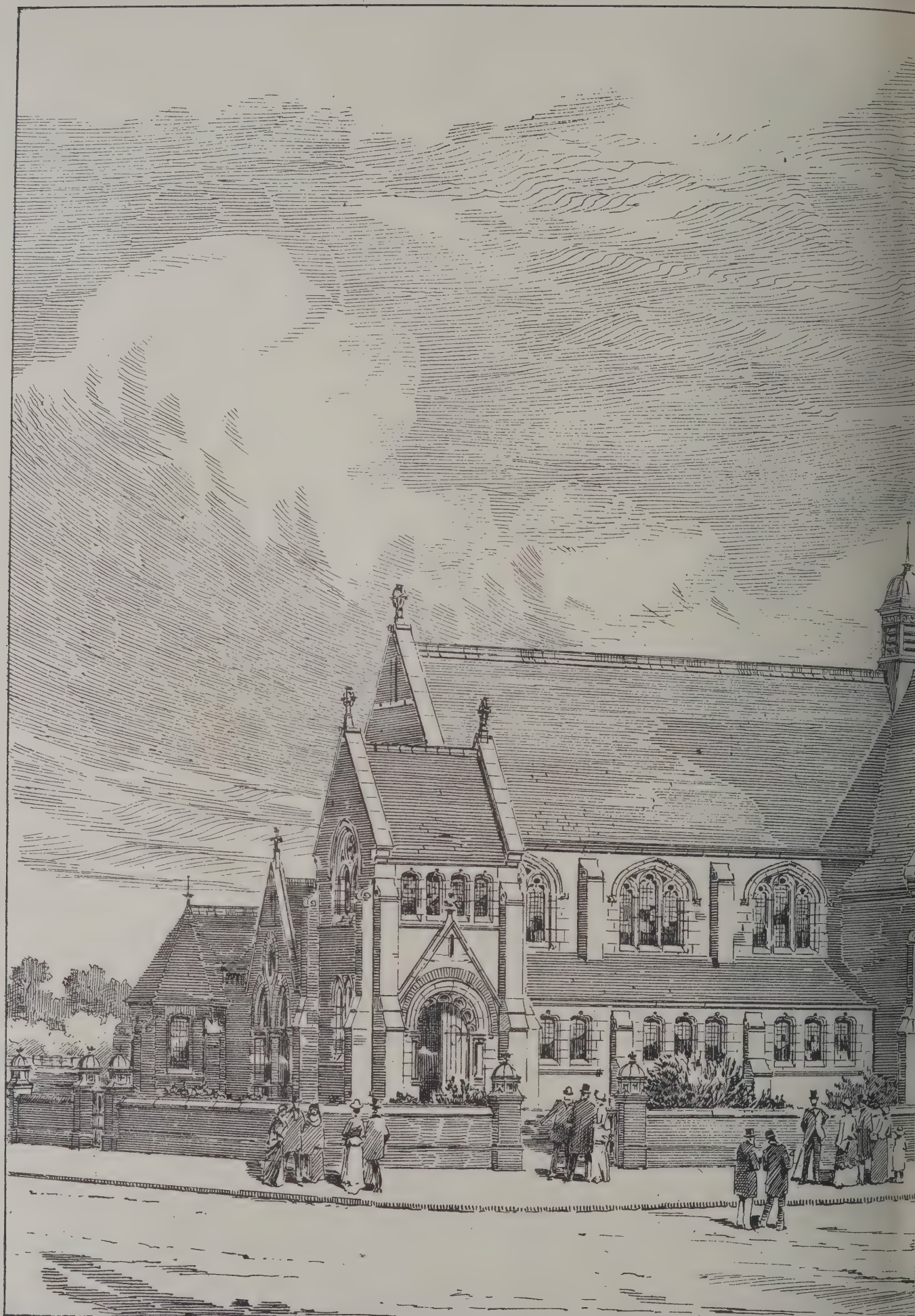


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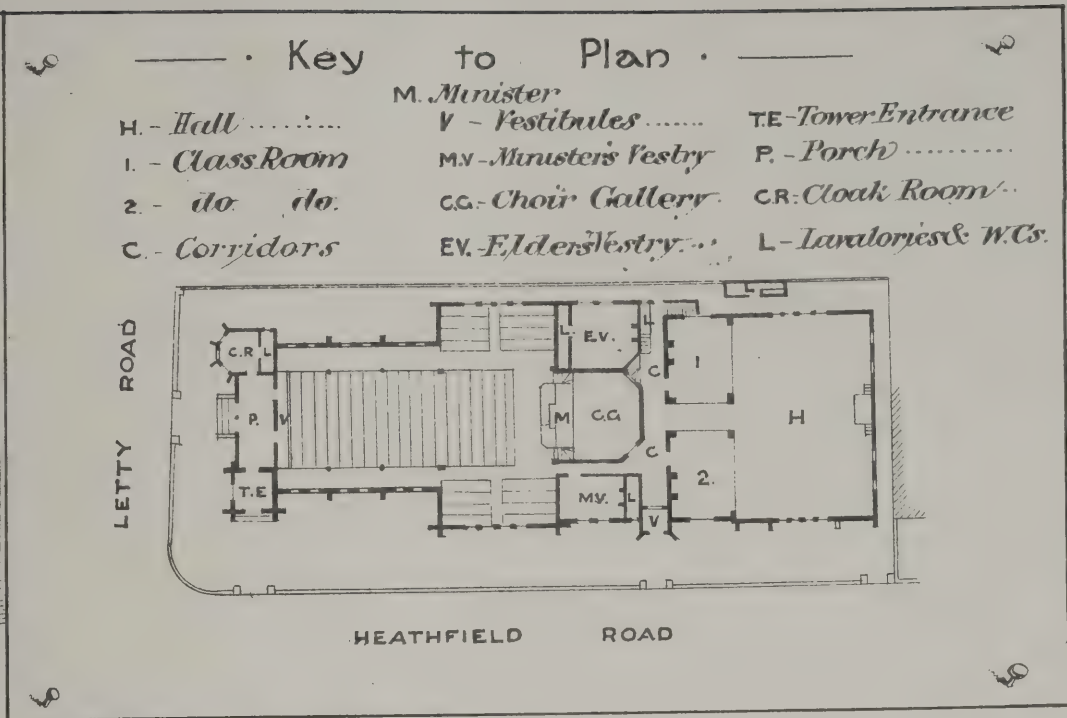
Ground Floor Plan



Plan of Basement Floor.



+ NEW + PRESBYTERIAN + CHURCH + HEATHFIELD + ROANOKE



ILLUSTRATIONS.

THURLAND CASTLE, KIRKBY LONSDALE.

BISHOPSGATE INSTITUTE.

THE buildings, comprising hall, library, reading-room, board-room, offices and caretaker's house, which were opened on Saturday last, have been designed by Mr. C. HARRISON TOWNSEND and erected by Messrs. JOHN MOWLEM & Co., Mr. THOMAS LEE acting as clerk of the works. The elevation of the principal entrance (in Bishopsgate Street) has been carried out in light yellow terra-cotta, supplied by Messrs. GIBBS & CANNING, of Tamworth, the modelled work having been executed by Mr. AUMONIER. Above this entrance are the board-room and the clerk's offices.

The Institute has also side and back entrances in Brushfield Street and Duke Street, the frontages of which have been carried out in red brick with dressings of terra-cotta.

For general access a corridor runs the whole length of the buildings, and to insure perfect quiet and convenience to the public the library and reading-rooms have been placed as far as possible from the traffic of Bishopsgate Street, and are also cut off from the hall by another corridor. The corridors and staircases have been lined with glazed tiles by Messrs. MAW & Co.

The floors of the corridors and vestibules are of marble mosaic set in red cement and laid by Messrs. MAINZER & FARRER. The floors of the library and hall are laid with GODDARD'S patent oak block flooring and are of fireproof construction, upon Messrs. HOMAN & ROGERS'S system.

The stairs to the library and board-room are of solid teak. The hall, 80 feet long, 48 feet wide and 42 feet high, will seat about 500 people. The exit doors, 10 feet wide each, open immediately into thoroughfares, and are so arranged that the whole audience could, in case of panic, easily quit the building within two or three minutes. In addition to the high clerestory windows, a toplight is provided with a view to the hall being occasionally used for exhibitions of paintings, &c. The platform is provided with ample means of exit and with dressing-rooms and other accommodation. Space has also been provided at the back of the platform for an organ, to be blown by hydraulic power.

The lending library, director's room and reference library on the ground floor are 15 feet 6 inches high. The height of the reading-room on the first floor is 15 feet. The basement is very commodious and well ventilated.

The gas-fittings throughout the building have been supplied by Messrs. SUGG & Co., of Westminster.

The foundations are in concrete, carried down to the natural gravel, and the outer area and basement walls are constructed of solid brickwork, faced on the exterior with Seyssel asphalt. In excavating the site a number of interesting curiosities were discovered at a depth of about 15 feet from the ground level. These comprise coins, bones, a skull and specimens of pottery of the Elizabethan and other periods.

Like the other institutions which the Rev. WILLIAM RODGERS has promoted, the Institute has special characteristics, and we have no doubt it will also be a memorial not only of his energy and benevolence but of his farsightedness.

NEW PRESBYTERIAN CHURCH, HEATHFIELD ROAD, BIRMINGHAM.

THIS building is about to be erected on the Heathfield Estate, Handsworth. The seating accommodation is about 400. In addition to the rooms shown on the sketch plan, there is choir vestry, kitchen and heating chamber.

The exterior will be faced with red bricks with Hollington stone dressings, the internal dressings being of Bath stone. The roofs are covered with best pressed red tiles.

The architect is Mr. JOHN P. OSBORNE, F.R.I.B.A., of Birmingham.

SOCIETY OF ARCHITECTS.

AT the ordinary meeting of the Society of Architects, held on November 27, Mr. E. J. Hamilton, president, in the chair, Mr. Ellis Marsland read the following paper on

The London Building Act of 1894.

Mr. MARSLAND said:—Since I last had the honour of addressing you upon London building law, the Bill promoted by the London County Council, which was then the subject of my paper, has passed into an Act, and comes into operation on January 1, 1895. This has been done at a vast expenditure of time and money, and the opposition which it encountered in its progress through both Houses of Parliament has shorn it of a great number of its progressive or, as some would have it, objectionable features.

One hears on all sides a considerable amount of gratification on the part of the various bodies who actively opposed the Bill at the success of their opposition in securing that their particular views were either added to the Act or some objectionable clause struck out; but it appears to me that if all these opposing forces are viewing their endeavours with such mutual satisfaction, we have now either a very perfect measure or a case of too many cooks. This, of course, remains to be seen. We as a Society, although we did not actively oppose the Bill, have every reason to be satisfied with the result of the suggestions for amendment made to the London County Council, there being scarcely one which has not been incorporated.

If we look at the Act simply as one of consolidation it will be of immense advantage; there is, however, a good deal of fresh matter, and considerable changes will be caused in the carrying out of building operations both to the builder and architect. The object of my paper this evening is to point out the more important variations from the old law.

It will of course be impossible in the limited time at my disposal this evening to go through the whole of the new Act, so that I must necessarily presume that most of those present have an acquaintance with the present Act so much of which is incorporated with the new, and it is my intention to point out only the new sections and subsection which will affect us as architects.

The Act is divided into sixteen parts:—(1) Introductory. (2) Formation and widening of streets. (3) Lines of building frontage. (4) Naming and numbering of streets. (5) Open spaces about buildings and height of buildings. (6) Construction of buildings. (7) Special and temporary buildings and wooden structures. (8) Rights of building and adjoining owners. (9) Dangerous and neglected structures. (10) Dangerous and noxious businesses. (11) Dwelling-houses on low-lying land. (12) Sky-signs. (13) Superintending architect and district surveyors. (14) By-laws. (15) Legal proceedings. (16) Miscellaneous.

There are four schedules:—The first dealing with the construction and thickness of walls; the second detailing what are deemed to be fire-resisting materials; the third being a list of fees payable to district surveyors and the Council; the fourth containing a list of the repealed Acts.

In Part I. I would like to draw attention to some of the definitions in section 5. The number is considerably increased.

The expression "new building" means and includes: (1) Any building erected after the commencement of the Act; (2) any building which has been taken down for more than one-half of its cubical extent, and re-erected or commenced to be re-erected, wholly or partially, on the same site after the commencement of this Act; (3) any space between walls and buildings which is roofed, or commenced to be roofed, after the commencement of this Act.

It is important to bear this in mind, as should you desire to cover a space bounded on three sides by old buildings, you will have to ascertain that these walls meet the requirements of the Act and by-laws as to their thickness, foundation and damp-course. An alteration or addition to a building is brought within the operations of the Act by section 209.

The definition of a public building has been amplified, and includes an hotel, lodging-house, home, refuge, or shelter. If the building is of greater capacity than 250,000 cubic feet, or has sleeping accommodation for more than one hundred persons, this latter clause will be somewhat difficult to interpret, as with only 100 beds the corridors, passages and landings, and flights of stairs need be only of wood, but with an additional bed, or with a double bed in place of a single one, the whole character of the building is changed, and what with 100 beds could be constructed of wood, would with 101 beds have to be constructed of fire-resisting material under section 68. The district surveyor would have to make a periodical visit to enumerate the sleeping accommodation, which possibly might be a somewhat difficult, not to say delicate, task, as under section 206:—Any building, structure or work in any respect exempt from the operation of the Act or in any manner privileged in respect of any provision of this Act shall remain so exempt or privileged, so long only

as it is used for the purpose or retains the character by reason whereof it is so exempt or privileged.

Part II. of the Act, which deals with the formation and widening of streets and the position of new buildings with reference to streets, is mostly new matter.

New roads or streets cannot now be formed or ways adapted either for carriage traffic or foot traffic without first applying to the Council, the application to be accompanied by plans and sections and such other particulars as the Council may require.

The Council may refuse to sanction the plans in the case of a new road or street upon the following grounds:—

1. Where it is not 40 feet wide, if for carriage traffic.
2. Where it is not 20 feet wide, if for foot traffic.
3. Where it is not open at both ends.
4. Where it does not form direct communication between two streets.

5. Where it appears that a street proposed for foot traffic only should be used for carriage traffic as well.

6. Where a street has an unsuitable gradient.

7. Where a street is not in conformity with the by-laws.

And in the case of an adapted road for carriage or foot traffic upon the following grounds:—

1. Where houses or forecourts come within 20 feet of the centre, if the way is to be used for carriage traffic.

2. Where a road for foot traffic only is not widened to the full width of 20 feet.

3. Where such widening would result in the formation of a street not being open at both ends.

4. Where such widening would result in the formation of a street not affording direct communication between two streets.

5. Where it is proposed to widen a street for foot traffic only, and it appears to the Council that it would be better to widen it for carriage traffic as well.

6. Where the widening would result in an unsuitable gradient.

7. Where any of the Council's by-laws would be contravened.

The Council are bound, however, to answer your application within two months, and if they refuse must state fully all their reasons for such refusal.

The Council also, if they deem it expedient in the public interest and after notice of their intention to the local authority, may direct that a street, if not within two miles of St. Paul's Cathedral, shall be of a greater width than 40 feet up to 60 feet, or a street may be widened more than the prescribed distance from the centre up to 30 feet, provided that they pay to the owner compensation for the loss or injury sustained by him by such requirement. The position of new buildings or the forecourts of new buildings in old streets being highways is limited to the prescribed distance from the centre of the roadway except by sanction of the Council, but the prescribed distance may also be increased up to 30 feet provided that the owner is paid compensation for any land given up above 20 feet.

If, however, an old building abuts upon a street and the frontage comes within the prescribed distance, and it is desired to rebuild it, correct plans of the old building must be drawn and certified as correct by the district surveyor, and thereupon the site of the old building may be occupied by the new to the same extent but no more; if, however, this is not done the new building must be set back. There is one exception, and that is that no dwelling-house to be inhabited by persons of the working class shall, without the consent of the Council, be erected or re-erected within the prescribed distance to a height exceeding the width of the street, and that no building or structure shall be converted into such dwelling-house within the prescribed distance so as to exceed such height.

This section, however, does not affect the frontage of buildings erected on any private road or way (not being a highway), but it must be borne in mind that if at any time it is desired to convert such a road into a highway, it cannot be done except all projections within the prescribed distance and erected after 1878 are set back. It should be noted that some of these restrictions do not apply to the City.

In Part III., dealing with lines of building frontage, the old rule is maintained that no building or structure is to be erected beyond the general line of buildings in any street without the consent of the Council. Such general line of buildings to be defined by the superintending architect, who is to issue his certificate within one month of the application, and whose decision may be brought before the tribunal of appeal. You are not, however, prevented from advancing your frontage line without consent to within 50 feet of the highway if your forecourt in front exceeds this distance; but if by so doing you interfere with your neighbours' light and air, he has his ordinary common law remedy.

The Council, in giving their consent to any projection beyond the line of frontage, have power to attach certain conditions as to giving up land to be left open for the public use or the particular use to which the projection is to be put, and generally any other condition which they may deem it expedient to impose in the public interest.

The superintending architect is also to determine in any doubtful cases in what street any particular building or structure is situate, and which is the front and rear of buildings; but any person feeling aggrieved at his decision may appeal to the tribunal of appeal.

It is also necessary to bear in mind that the whole of this Part III. of the Act does not apply within the City.

Part IV. of the Act dealing with the naming and numbering of streets is not of much interest to architects, and may be passed over.

Parts V. and VI. I propose to group together under three heads, viz.:—1. Additional open space, light, air, and ventilation about buildings and other considerations of health. 2. Additional means of safety from fire and panic. 3. Additional structural requirements.

The clauses relating to the open spaces about domestic buildings are the most complicated and important of any in the new Act.

But if we bear in mind that there are three classes of conditions under which the open space is to be provided, it will help us considerably to a correct understanding of these sections.

Firstly, there is the open space to be provided to a domestic building erected after the commencement of the Act, and abutting upon a street formed after the commencement of the Act, *i.e.* a new site and a new road.

Secondly, there is the open space to be provided to domestic buildings erected after the commencement of the Act on sites not hitherto built upon, but abutting upon a street laid out before the commencement of the Act, *i.e.* a new site and an old road.

Thirdly, there is the open space required upon the sites of old buildings abutting upon old streets, *i.e.* an old site and an old road.

Under each of these three heads we have a preliminary requirement of 100 square feet for light and air to any habitable basement which is to exclusively belong thereto, and be free from any erection thereon above the level of the adjoining pavement, which open space need not necessarily adjoin the rear boundary of the premises.

Under the first of these conditions, *i.e.* a new site and a new road, the following additional open space in rear is required (provided the site is not a corner one or has a road in rear), viz. 150 square feet, which is to be provided at the adjoining pavement level and free from any erection, except a water-closet and receptacle for ashes; if, however, the ground storey is not constructed or adapted to be inhabited, the open space may be at the level of the ceiling of the ground storey or a level of 16 feet above the level of the adjoining pavement. This is to allow a shop to extend over the whole of the ground storey.

This open space is to extend throughout the entire width and to a depth in every part of at least 10 feet, so that you see in a 20 feet frontage the minimum space would be 200 square feet.

The height also of the building in rear in relation to the space is to be determined as follows:—

A horizontal line is to be drawn at right angles to the roadway at the pavement level to the rear boundary of the site.

At this point a diagonal line is to be drawn at an angle of 63½ degs., and no part of the building is to extend above the diagonal line except chimneys, dormers, gables, turrets or other architectural ornaments, aggregating in all to not more than one-third of the rear elevation of such building.

There are other subsections, dealing with cases where the front line of the site is not level, or where the site inclines towards the roadway, or where the building site is so irregular in shape that a doubt arises as to how the measurement is to be taken. In this latter case application is to be made to the Council, and if the applicant is dissatisfied he may appeal to the tribunal.

Where the land in rear of any such building abuts upon a street or public space no open space in rear need be provided, and the diagonal line may start from the centre of the roadway or at the further boundary of the public space.

In the case of a building on a corner site abutting upon two streets, or upon a street on one side and a public space 40 feet wide on the other, the Council may permit, upon application to them, the erection of buildings not exceeding 30 feet high upon such part of the space in rear as they may think fit, provided that the Council is satisfied that such buildings shall be so placed as not to interfere unduly with the access of light and air to neighbouring buildings. The applicant, however, if dissatisfied with the decision of the Council, may appeal to the tribunal.

The return front of a corner site is allowed to be the full height of the front elevation for a distance of 40 feet.

Any exceptional case, owing to the irregular shape of the land preventing the provisions of this section being applied, are to be dealt with by the Council, and if the applicant is dissatisfied he may appeal to the tribunal.

In the case of a domestic building and a stable in rear, the

front of the domestic building being upon a street and the front of the stable upon a mews, and the depth of the site not more than 150 feet, the stable may be 50 feet deep and 25 feet high, and the open space may be provided between the stable and the house—the diagonal line may start from the centre of the mews.

Houses abutting upon the river Thames or a public park, or on a public space of not less than 80 feet, do not come under this section.

Under the second of these conditions, *i.e.*, a new site and in old road, the open space is determined in the same manner as previously explained, but the diagonal line is to start 16 feet above the level of the adjoining pavement instead of at the level of the same (except in the case of dwelling-houses to be inhabited by persons of the working class).

There is, however, an important modification of the rule with reference to buildings not being allowed to extend above the diagonal line. It is this. Any part of any domestic building may extend above the diagonal line provided the Council shall be satisfied that an open cubic space of air will be provided at the rear equivalent to the open cubic space which section 41 provides; but it is open to this objection, that you cannot adopt it without the sanction of the Council, and if you are dissatisfied with their decision you have to go to the tribunal.

Under the third class of conditions, *viz.* old site on old roads, it is important to note that before commencing to erect a new domestic building you have to prepare plans, showing the extent of the previously existing domestic building in its several parts, and to submit them to the district surveyor, who is to certify the same under his hand.

You may then erect the intended domestic building, but so that no more land shall be occupied by the new building than was occupied by the previously existing building. If you do not submit plans as I have described, you are to be bound by the provisions hereinbefore mentioned. If, however, you wish to deviate from such old plans you must apply to the Council, and, if dissatisfied with their decision, go to the tribunal.

I should also like to draw your attention to section 42, which deals with the open space to be provided to dwelling-houses to be inhabited or adapted to be inhabited by persons of the working class, not abutting upon a street.

Before you can commence the erection of such buildings you must deposit at the County Hall complete plans of the same; then you have to wait one month, and if in the meantime the Council offer no objection to them you may proceed. If, however, the Council refuse to sanction them, or sanction them subject to certain modifications, you must submit or go to the tribunal of appeal.

The Council, however, cannot refuse their sanction if the plans show as much open space as would be provided if the buildings abutted upon an old street.

Under section 44, should you desire to rearrange a cleared area previously occupied in whole or in part by buildings, and to form, lay out, or widen streets thereon, you have to apply to the Council and submit your plans, and the Council may, if they, under all the circumstances of the case, think it desirable, modify or relax any of the before-mentioned provisions as to open space.

If they disapprove of the plans, they must say so within two months, and if they do not you can proceed.

If they disapprove, and you are dissatisfied, you can appeal to the tribunal.

The section relating to courts within a building for light, air and ventilation is divided into two parts, *viz.*, courts enclosed on all sides and courts enclosed on all sides except one.

If a court is enclosed on all sides, and its depth to the ceiling of the ground storey exceeds its length or breadth, adequate provision must be made and maintained by the owner for the ventilation of such court by means of a communication between the lower end of the court and the outer air. The expression "adequate" is rather vague, and it does not appear who is to decide as to what is considered adequate, and there is no reference to the tribunal of appeal in this section.

No habitable room is to be lighted and ventilated into a court enclosed on all sides, unless the width of the court is equal to half its height. The height is to be measured from the sill of the window to the eaves or top of the parapet of the opposite wall. It is somewhat uncertain whether it is the vertical line which is to be taken in measuring the height or the diagonal line, as the section states from the window-sill to the eaves or top of the parapet of the opposite wall.

A court enclosed on all sides can be made oblong in shape if it contains as much superficial area as a square one, provided the length is not greater than twice the breadth.

Courts enclosed on all sides except one, and the length being greater than the width, cannot have the window of an habitable room lighted into it unless the distance from the window to the opposite wall is equal to half the height of such wall measured from the window sill.

Every habitable room must now open into the external air,

and the size of the window or windows in such habitable room is to be equal to one-tenth of the floor space, half of which is to be made to open. Habitable rooms may, however, be lighted by a skylight or dormer, and in that case the window is to equal one-twelfth of the floor space, half of which is to open.

Staircases in tenement houses must be ventilated upon every storey above the ground storey by means of windows or skylights opening directly into the external air, or shall be otherwise adequately ventilated, but who is to determine what is adequate ventilation is not stated.

Staircases to ordinary dwelling-houses have also to be ventilated by means of a window or skylight opening directly into the external air.

Ventilation is also required under the floors of basements, except where the floor is of solid wood blocks bedded on concrete.

(To be concluded.)

A vote of thanks to Mr. Marsland was proposed by Mr. W. R. Mallett, seconded by Mr. H. Lovegrove, A.R.I.B.A., and supported by Mr. G. A. T. Middleton, A.R.I.B.A., and Mr. W. Allport, and carried with acclamation.

THE EARLY HISTORY OF THE SOCIETY OF ARTS.*

TO William Shipley, a landscape painter, "who, from a well-grounded persuasion of the extensive utility of the art of drawing to this nation, erected the academy in the Strand, opposite Exeter Change," is due the credit of having founded the Society of Arts. His proposals for raising, by subscription, a fund to be distributed in premiums for promoting improvements in the liberal arts and sciences, manufactures, &c., were made in 1753—eight years after the suppression of the Jacobite rising of '45—at a time of great literary activity, but when the agriculture, the arts, the manufactures of the country were at perhaps as low an ebb, compared with the Continent, as they have ever been. The next year, 1754, a meeting was held at Rawthmell's Coffee House, in Henrietta Street, Covent Garden, to consider the propriety of establishing a Society for the Encouragement of Arts, Manufactures and Commerce. The only learned societies existing at that time in the kingdom were the Royal Society, founded in 1660, and the Society of Antiquaries, which was founded in 1701 and incorporated in 1751. In the opinion of those present at Rawthmell's Coffee House, it was considered that drawing was absolutely necessary in many employments, trades and manufactures, and that the encouragement thereof might prove of great utility to the public. If any of those gentlemen had managed to live another 140 years they would have been gratified, no doubt, at finding that drawing was now a compulsory subject of instruction in elementary schools in England and Wales, though still only optional in Scotland, and but sparsely cultivated in Ireland. Far-seeing as they were, however, these gentlemen—those names are, I trust, preserved somewhere—had to satisfy themselves with offering prizes, which were duly advertised on March 29, 1754, to boys and girls for drawing, besides offering premiums for the discovery of cobalt in England, the growth of madder—the price of which had been raised to an extravagant figure by foreign growers and importers—and the manufacture of buff leather. It is interesting to find that among those boys and girls who received prizes for drawings in 1755—the first year of their award—was Richard Cosway (then under twelve years of age), who became the celebrated miniature painter and Royal Academician. Of his works the Society possesses two examples—the portrait of William Shipley, who founded the Society, and was its first secretary, and of Dr. Templeman, who was secretary from 1760 to 1769. Among others who received the premiums of the Society, and subsequently became distinguished artists, were John Bacon, for a figure of Peace; Joseph Nollekens, for a model of a farmer with a kid; William Woollett, the engraver, for a figure drawing. This was in 1759; while, in 1763, there occur the names of Thomas Banks, John Mortimer, George Romney and Richard Earlom, the mezzotint engraver. In 1766 John Flaxman, then only eleven years of age, appears in the premium list, and in 1788 Thomas Bewick writes that "the favourable impression which some of my juvenile performances have met with from the Society of Arts emboldens me to again submit my labours to their view." In later years we find the names of Lawrence, Turner, Mulready, Ross and Landseer, Frith, Millais and Hook.

The prizes seem to have been restricted to students who were under twenty or twenty-one years of age, and were given

* From the address delivered by Major-General Sir John Donnelly, K.C.B., at the first ordinary meeting of the Society on the 21st inst.

principally for drawings made from a collection of sculpture and casts formed for the Duke of Richmond between 1750 and 1756 by John Wilton, which collection his Grace patriotically placed at the disposal of the Society for this purpose; and for drawings made at the Academy which had been established by William Shipley. I may mention in this connection, as showing what the State was doing and what other opportunities were afforded to students, that the British Museum, in the establishment of which some of the early patrons of the Society of Arts seem to have largely participated, was not opened to the public till 1759. It had its origin in the bequest by Sir Hans Sloane—who died in 1753—of his collection of natural history, his large library and his curiosities, in the purchase of which he had, it is said, expended 50,000*l.*, to the use of the public on condition that Parliament should pay 20,000*l.* to his executors. The money for this and the purchase of Montagu House and grounds was raised by a public lottery, with guinea tickets. The National Gallery was not established until some seventy years after the Society of Arts was founded.

The Royal Academy, which was founded in 1768, grew out of the exhibitions of the works of the competitors for the prizes offered by the Society of Arts. Before that took place, however, in 1755, Mr. Henry Cheer, one of the judges in the first art competition, proposed to the Society "a plan for an academy of sculpture and painting," accompanied by a draft of a proposed charter of incorporation, and it is probable that when William Shipley proposed the establishment of a Society for the Encouragement of Arts, Manufactures and Commerce, he had in view principally the encouragement of art. However that may be, in 1760 Francis Hayman, chairman of the committee of artists, requested the Society to allow an "Exhibition of Polite Arts" to be held in their great room. This was granted, and the first exhibition of works of native artists was opened on April 21, 1760, in the Society's rooms in the Strand, near Beaufort Buildings. The origin of these exhibitions is thus recorded in the first volume of the *Transactions* of the Society:—"The reputation acquired by candidates in consequence of their performances remaining for some time under the inspection of the Society, before and after adjudication, occasioned the artists in general to apply for an exhibition of their works in the Society's great room, which request was accordingly complied with and repeated for several years. Hence arose the annual exhibition of the rival artists who formed themselves into separate bodies." According to the writer of an article in *Engineering*, these were called the "Free Society of Artists" and the "Society of Artists of Great Britain," and out of the split grew the Royal Academy, which appears to have been assisted, at the outset, from the funds of the Society of Arts.

"The Society having been thus far fortunately successful," I am quoting again from the *Transactions*, "in rearing the infant arts in this kingdom to such maturity as qualified them for royal favour, next confined the award of their premiums to those who may intend to be professors of the arts, or such young persons of rank and eminence who may probably become hereafter the patrons and patronesses of the fine arts. Encouragement has also been given to those branches of the polite arts which will more immediately tend to improve the manufactures and consequently promote the commerce of the country."

This may sound rather tall talk. But it must be remembered that the Society became very rapidly influential. A large number of well known and distinguished men joined it at the outset. The signature book of the Society, which is dated 1754, but continued in use for some time after, shows that among its members were a considerable proportion of the peerage—I may mention the Dukes of Devonshire, Marlborough, Portland and Queensberry, and apparently nearly all the eminent Commoners of the day, such as Samuel Johnson, Boswell and Topham Beauclerk; Henry Cavendish, Benjamin Franklin and William Hunter; Sir W. Chambers, the architect; George Colman, the dramatist; David Garrick and Gibbon, and John Howard, the philanthropist; Hogarth, Allan Ramsay and Sir Joshua Reynolds; Horace Walpole and John Wilkes. Goldsmith was not a member, but was an unsuccessful candidate for the secretaryship. The only speech Dr. Johnson is said to have made on his legs was delivered in the meeting-room of the Society of Arts. Before leaving this sample, if I may say so, of the early list of the patrons of the Society, I must not omit the name of John Angerstein, whose fine collection of pictures formed the nucleus of the National Gallery. It will thus be seen that in any movement which the Society supported it could throw great weight and influence.

It is amusing to find the Society in these early days trying a kind of graduated income tax in a small way. Thus the contribution of a nobleman was five guineas, while that of a commoner was generally only two. Among the few commoners who gave five guineas were General Robert Clive (afterwards Lord Clive), and William Pitt (afterwards Earl of Chatham).

I have said enough I believe to show to what extent the Society influenced art education in its early days, and must now hurry on to its later work. But before doing so it is as well

perhaps to call attention to the fact that the Brothers Adam having, in 1768, commenced their scheme for erecting a handsome set of houses on the piece of land formerly belonging to Durham House—famous for such distinguished residents as Lady Jane Grey and Sir Walter Raleigh, among others—an arrangement was made with them for the erection of the building which the Society now occupies. The first stone was laid by Lord Romney, then president of the Society, on March 28, 1772, and in June 1774 the Society entered on its new premises. It was thought desirable to take advantage of the opportunity afforded, by the fine meeting-room in the new house, to attempt to give a fitting representation on its walls of the powers of the English painters whose works had been first exhibited under the auspices of the Society. A proposal was therefore made to some of them in 1774, through Mr. Valentine Green, the engraver, a member of the Society who took much interest in its welfare, to paint eight historical and two allegorical pictures. For the former, application was made to Angelica Kaufmann, Sir Joshua Reynolds, Benjamin West, Cipriani, Dance, Mortimer, Barry and Wright; for the latter, to Romney and Penny. The scheme came to nothing—it is said, mainly owing to the opposition of Reynolds. This may be so; but seeing that the only payment offered to the artists was the profits of an exhibition of their pictures for four months, I think we need scarcely go so far a-field to seek the reason for the "promising" scheme coming to grief. In 1777, however, Barry, who is described as being at that time young and enthusiastic, and having 16*s.* in his pocket, offered to do the works which now surround your rooms, apparently for nothing more than the cost of the canvas, paint and frames; these frames he designed as you see them, and for them the Society paid 100*l.* 17*s.* I am glad to say, however, that the young and enthusiastic artist did not remain entirely unremunerated, for the public exhibition of his works, which was held at the expense of the Society, and was visited by some 9,950 persons, produced about 500*l.* The remuneration was not extravagant, and he complained that his works were being neglected, while thousands of pounds were being squandered upon a "jubilee of hackneyed German music; an empty hubbub of hundreds of fiddles and drums, which was dissipated into the air as soon as performed." But still it is something to know that, having worked in faith with zeal, his faith was not altogether misplaced pecuniarily, and that for a time his works were the talk of the town, as being the first attempt in England to revive the art of covering walls with large decorative pictures.

The history of the Society to the end of the eighteenth century was one of great brilliancy of achievement, though marked by some vicissitudes.

In its very early days the Society of Arts showed its just appreciation of the right course to pursue in not confining its efforts to the education of the producer, but in extending it to that of the consumer. As was soon made evident by the Government schools of design, established by Mr. W. Ewart's committee of the House of Commons in 1834, the question is not one simply of producing designers. What is the use of them until the popular taste can appreciate good decorative work, or discriminate between it and that which is vulgar and bad? And if intelligent appreciation is necessary to give mechanical invention, whose fruits appeal so directly to our material interests, a fair chance, how much more necessary is it in all that implies artistic treatment? Fine artistic perception is limited to the comparatively few, but who can prove to the rest of the world their ineptitude, their want of taste? If it concerned themselves only there would be no particular reason for making the attempt, but the law of supply and demand is no less inexorable in matters æsthetic than in matters materialistic. There is plenty of fair artistic ability potential in the land, if only the demand for its products were sufficient and of the right kind; an artificial forcing of the supply is absolutely useless without the demand.

But why, it may be asked, is it necessary to educate people in such matters now any more than it was in the times when those works were produced that are generally admitted to be examples for study? The answer is surely obvious. There is at the present time no living traditional art—it is all a matter of eclecticism. There is no sound basis of criticism, but plenty of it with a strictly literary backbone. Now, do not misunderstand me when I say there is no living art. I do not mean there are no living artists. Perhaps there are as great artists now as at any period. But they work in a very different environment. Take architecture, which, after all, must strike the keynote to all the arts of the day. During my lifetime we have been practising Classic, Gothic, Renaissance, Palladian, Italian, Jacobean, Queen Anne, and so on, while a few enthusiasts have brought in a spice of Mohammedan, Hindoo and Chinese. It is not my business to say which is right or which is the best; they are all right in a sense. I only desire to call attention to the difference in the circumstances during, say, this century, and the time when the admitted masterpieces were produced. Then, at a definite period, a specific form or style of art pervaded a whole country;

it had gradually been evolved from something that had gone before, and its evolution was proceeding, possibly, to something more vigorous, possibly, to decay; still it was a living art. The art patron of the day did not, before giving his order, run first through the whole gamut of styles to make his selection. He knew he must take what he wanted in the style of the day, and be thankful if it was good of its kind—the kind was the canon and standard of criticism. The artist worked; appreciated, stimulated, and to some degree checked by an intelligent public opinion which had been educated and instructed by its surroundings in that particular style of art. How different to this is the practice of late times. It is a toss up what the style may be. The work of the artist, instead of being spontaneous, is more or less an archaeological study. It is criticised as often as not for its style rather than for its goodness as an example of that style. The general public shrugs its shoulders, wonders what it is all about, and when something will be invented which, if lauded to the skies by some, will not be denounced as a monstrosity and an eyesore by at least an equal number of the art cognoscenti.

Let me give you an instance. I dare say several of those present can recall to mind the onslaught made on the design selected for the monument of the Duke of Wellington in St. Paul's, which was surmounted by an effigy of the Duke on horseback. The attack was led by perhaps the ablest periodical of the day as far as literary ability went, which had Gothic proclivities. The climax was reached in a remark attributed to a dignitary of the Church as to his inability to understand how a man could ride on horseback on the top of his own coffin. Alfred Stevens who, by the way, was some time master of the School of Design in Sheffield, is now generally admitted to be one of the greatest, if not the greatest, sculptor and original decorative artist that England ever produced, and the monument is, I believe, shortly to have the horse and rider provided for it according to the original design.

Under these circumstances it is to be wondered at that there are constantly violent fluctuations of opinion—that every now and then we hear a great outcry against the Royal Academy and its schools or South Kensington and its "system." And if South Kensington now why not in a few years hence the technical schools and courses of instruction which are being set up with so much care and thought in all parts of the country? I am sure this danger is already felt by many who are interested in technical instruction. The Science and Art Department could always point to the fact that, if its science teaching was wrong, it erred in good company, for the syllabuses were prepared and the examinations were conducted by some of the most eminent men of science of the day. If its art training was wrong, it was that which had been laid down by some of the most accomplished artists of the day; it was watched and reported on by such from year to year; and the so-called "system" was, for the matter of that, no invention of South Kensington, but the plan on which artists had been taught their trade from time immemorial.

But to whom can the local authorities under the Technical Instruction Act appeal? It seems to me that for their own satisfaction and for the future stability of technical instruction, they will desire, instead of remaining as it were isolated and self-contained, to have an influential examining and inspecting board, to which they might refer, if they found it desirable, for assistance and advice. There are at present several bodies partially covering the ground—but only partially, such matters, for instance, as the art industries, which have been largely taken up by County Councils, coming into nobody's parish; and there is the great disadvantage of a want of unity. This is not the moment to bring forward any detailed scheme. I desire now simply to throw out the suggestion that the Society of Arts, which is at present covering part of the field, should take the initiative in bringing all these bodies together, so that they may form some kind of joint board, or at least co-operate.

THE PHILÆ-ASSUAN DAM PROJECT.

THE following official memorandum upon the proposed modification in the Assuan dam project has been drawn up by Mr. W. E. Garstin, Under-Secretary of State in the Egyptian Ministry of Public Works:—

The Council of Ministers on June 3, 1894, approved in principle of the proposed dam and reservoir at the Assuan cataract, and directed the Ministry of Finance, when preparing the Budget for 1895, to occupy itself with the question of obtaining the funds necessary for the execution of this work.

The project, as then submitted to the Government, consisted of a dam with its crest at R.L. 114'0", which height would have enabled water to be stored in sufficient quantity for the requirements of Middle and Lower Egypt; in other words, for the whole country lying to the north of Assut.

Most unfortunately the construction of this dam would have necessitated the submersion for some six months every year of the celebrated Philæ temples, as well as of a considerable

number of Nubian monuments, which, although less known than those of Philæ, are of great importance to all those interested in the history of Ancient Egypt.

The archaeological societies of Europe, upon hearing of this proposal, protested against it in the strongest terms, and begged the Egyptian Government to reconsider its decision and to endeavour to find some alternative scheme by which the country might reap the advantages to be derived from a storage reservoir, without sacrificing the interests of science and archaeology.

The Ministry of Public Works, recognising that these protests were founded upon reasons so strong as to command respect, reconsidered the whole matter in detail, and endeavoured to find such modifications of the original scheme as might reconcile the interests of Egypt and of science.

The result of its studies is the modified project which has now been submitted to the Egyptian Government.

Before describing the proposal itself it will elucidate the question if the chief arguments brought against the Assuan cataract as the site for the dam be briefly criticised.

The first of these is that this site is not the only possible one to be found north of Wadi Halfa.

The second, and at first sight the strongest argument against the proposal is that it is impossible to lay down as an axiom that the Assuan cataract site is the only feasible one for a dam, while the river valley south of Wadi Halfa has been unexplored and unsurveyed.

The first of the above arguments may be dismissed in a few words. The question has been studied and discussed in the minutest detail by the Government engineers and the members of the Technical Commission appointed to report upon the project. The former and the majority of the latter are unanimous in considering that the site in question is, from the nature of the river bed and the formation of the rock, the only one north of the second cataract at which it would be safe to construct a work of the magnitude of that proposed.

The only other possible sites are those of Kalabsheh and Silsileh; these have both been condemned from the point of view of hydraulic engineering by the majority of the Technical Commission, *i.e.* by Sir Benjamin Baker and Signor Torricelli.

These experts have stated in the clearest terms as their opinion that there is only one safe site for a dam between Cairo and Wadi Halfa, *viz.* the Assuan cataract.

In the face of the above statement, with which the Public Works Ministry is in entire accord, this latter can in no way accept the responsibility of constructing the work at any other place than at Assuan.

As regards the second objection, *viz.* that there are possibly other suitable sites to be found south of Wadi Halfa, it is true that no detailed survey of the river above the second cataract has as yet been made.

Sir John Fowler, however, during the reign of the Khedive Ismail made some very close surveys of portions of the river between Wadi Halfa and Dongola, for the purpose of laying out the line of railway projected to Khartoum.

His plans go to show that in all probability the only possible site for a dam and reservoir is at the cataract of Hanneh, or at the Khaibar gate, which lies a little to the south of it. Now the Khaibar gate is within some forty miles of the town of Dongola and consequently no work would be possible in this region until this town had been retaken from the followers of the Mahdi.

There is another point which the supporters of the argument in question would seem not to have grasped, *viz.* that even if, as is probable, a dam and reservoir be made at some future time to the south of the second cataract, it will still be imperative to have a second dam and a second reservoir north of this place and consequently nearer to the point at which the water must be delivered for the purpose of irrigation.

The reason for this lies in the waste which would inevitably ensue in the long reach of river down which the water would have to travel before it arrived at the point of its delivery.

The river channel is not in any way one of regular section, but consists mainly of long reaches of wide and shallow area, interspersed with islands and side channels which are dry when the river is low. Anyone who knows the Nile is aware of the long time which elapses at the first rising of the flood before the effect of the rise at Wadi Halfa is felt at Assuan and to the north. The water has first to fill up all the side channels and to saturate their sandy beds before any material increase is given to the volume passing down to the north. As the river, moreover, would be at its lowest when the reservoir was discharging, this loss of water would be at a maximum.

When we add to the above the loss which would ensue from evaporation due to the action of the African sun upon the long and shallow reaches of water, it is evident that the total waste would be considerable, and the longer the distance between the reservoir and the point of delivery the greater this waste would be.

The Public Works Ministry then considers, and in this opinion Sir Benjamin Baker fully concurs, that it is absolutely

necessary for the success of the scheme, even although a dam may be eventually constructed far to the south, that a second work shall be built north of the second cataract, and as near to the point of delivery as is consistent with obtaining a sound site for its construction.

The technical advisers of the Government consider that they have proved the Assuan cataract to be the only safe site north of Wadi Halfa, and consequently the question narrows itself into the smallest limits. Whatever may be done elsewhere, the construction of a reservoir dam at the Assuan cataract is an absolute necessity if the scheme of water storage is carried out at all.

Accepting the foregoing conclusions as final, the Ministry of Public Works is of opinion that the most reasonable course to follow is to commence with the construction of the Assuan dam. This will take several years to build, and it is possible that during the progress of the work opportunities may arise for investigating the country to the south. There seems, moreover, to be no valid reason, supposing that the necessary funds are obtainable, for delaying the commencement of this work until the further investigation has been taken in hand.

The modified scheme as at present submitted is of the nature of a compromise; it is hoped that it will satisfy the scientific world, while, at the same time, it will further the interests of this country.

It is now proposed to build a dam at Assuan with its crest at R.L. 106.0, or 8 mètres (26 feet) lower than that of the original project. This work will of necessity store very much less water than the high level dam would have done. At the same time a reservoir of this height will supply sufficient water for the wants of either Middle or Lower Egypt separately, although not for their combined areas.

This will mean that the reclamation of the country will proceed more slowly than was at first proposed; and when in course of time the country to the south has been explored a second dam can be made which will store sufficient water for the needs of the rest of Egypt.

This proposal is no new one, but has been fully discussed and estimated for in Mr. Willcocks's report upon the different sites.

The great advantage to be derived from carrying out the work in the above manner is that it will only submerge portions of the Philæ Island, while it will leave the rest of the Nubian monuments untouched. A reference to Mr. Somers Clarke's note upon these latter will show that their levels are well above that of the highest water surface in the modified project as now submitted.

As regards the Philæ temples, the main buildings will be above high-water level altogether. It is true that the South Quay wall and some of the smaller temples would be submerged if left unprotected. It will, however, be possible, by the construction of a low water-tight wall or by other means to so arrange for their protection that no damage will be done to them by the water.

To a certain extent the artistic beauty of the group will be impaired, but in a land so full of interesting relics as is Egypt it is unfortunately impossible to carry out any great public work without in some degree interfering with some one or other of them. The only thing to be done is to try and minimise the interference as far as is possible, and in the present case the Ministry of Public Works thinks that it has succeeded in so doing.

As regards the details of the protection works to be carried out upon the Philæ Island this Ministry will consult the scientific societies upon every point, and will endeavour, as far as lies in its power, to meet their wishes in the matter.

In order to still further minimise any possible loss to science which might ensue from the construction of the reservoir, it is proposed to carry out an archaeological and scientific investigation of the whole of Nubia.

The English societies very rightly impressed the necessity of this work upon the Egyptian Government. The latter, although both willing and anxious to carry it out, found it impossible to do so, owing to the necessary funds not being available. If, however, the reservoir be made this difficulty at once disappears, as the cost of the above investigation will be added to the estimate of the dam itself.

The Public Works Department has been directed to put in hand as much of the work as lies within its scope and power during the ensuing winter season. Topographical surveys will be made and plans prepared; the true bearings of the temples will be fixed, and the preliminary plans of all sites completed.

This portion of the work being done, the Egyptian Government will ask the European scientific societies to depute certain of their members to come to Egypt and complete the work.

In this manner it is hoped that a record and a knowledge will be obtained of this most interesting country which will be worthy of the present age, and which should be of the greatest value to the scientific world in the future.

A reference to p. 41 of the Under-Secretary of State's note upon "Perennial Irrigation in Egypt" (December 1893) shows

the estimated benefits obtainable from a reservoir of the capacity now proposed to be as follows:—

If Middle Egypt be selected.		
Direct Annual Gain to the State.	Increase in Annual Produce.	Increase in Annual Rental.
£E 572,000	£E 4,685,600	£E. 2,346,900
If Lower Egypt be selected.		
£E 278,000	£E. 3,290,000	£E. 1,600,000

In the foregoing the increased value of the land has not been taken into account.

As is admitted in the above quoted note, these figures appear startlingly high; they are so high, however, that a very large deduction might be made from them and yet leave a margin of profit sufficient to warrant an expenditure in excess of what it is proposed to incur.

As regards the final detailed estimates of the modified dam, they will not be submitted before the spring of 1895. Certain questions as to detail have arisen which necessitate alterations in portions of the design. Mr. Willcocks has been deputed by the Government to proceed to England and confer on these points with Sir Benjamin Baker. When these are once definitely settled the final drawings and estimates can be at once completed.

PUBLIC BUILDINGS IN FRANCE UNDER THE FIRST EMPIRE.

(Continued from page 338.)

204. **Telegraphs** (July 1, 1806).—The telegraph at the Louvre, which was on the central pavilion next the Rue Froimanteau, has been in use for the last ten or twelve years; that upon the large pavilion in the middle of the Tuileries, erected at the same time, has never been used. Both are being removed, and a new one constructed on the Church des Petits-Pères.

208. **Column of Austerlitz on the Place Vendôme** (July 9, 1806).—By a decree a departmental column for the department of the Seine will be erected in the centre of the Place Vendôme, in honour of the warriors of the department who have fallen on the field of battle. The design of the column, as well as those in other departments, was selected by open competition. M. Sobre was awarded the prize, and will carry out the work. M. Molinos, the architect to the department, executed the work for the laying of the first stone by the prefect. This will not be carried further. In 1804 M. Dénon, director of the Museum, instructed M. Thierry to prepare plans and models for a column here to Charlemagne, enriched with bas-reliefs and ornaments in cast-iron, like the chimney panels and candelabra at the Pont des Arts. It never got beyond models.

July 1, 1806.—M. Gondouin, architect to the Institute of France, and M. Lapeyre, architect, of the Egyptian Institute, are instructed to erect a bronze column, to be called the column of Austerlitz; the excavation has been made and the square is already full of materials. Is that the end of these designs? The *Journal de Paris* in the number for July 14, 1806, says that it will be formed of cannon taken from the enemy; it will be 13 feet* diameter, on the model of Trajan's column at Rome, which is 150 feet high, in twenty-three blocks or courses 4 feet 4 inches high, hollow in the centre, in which there is a staircase of 184 steps carried up with the courses of masonry (assise).

214. **Arch of Triumph of l'Etoile** (September 3, 1806).—The monument which is being erected on the Place de l'Etoile, at the top of the avenue of the Champs Elysées, justly excites the attention of the curious and the zeal of promenaders. At the present time the first course of stone is being laid, which will serve as the base. An estimate may be formed of its dimensions on learning that the foundations are nearly 1,000 feet in diameter and 40 feet deep. It was formerly said, "This is the work of the Romans;" in the future it will be said, "This is a work of Napoleon" (*Journal de Paris*). M. Chalgrin, the architect for this building, told me that he had excavated for and laid the first course of footings in rock at a depth of 23 feet, and that M. Ledoux, the architect of the two barrier lodges at the side, had carried them down to a still greater depth to the level of the bottom of the well adjoining.

217. **Hall of the Institute at the Palace of Fine Arts** (October 4, 1806).—The Institute inaugurated its new hall at Quatre-Nations by a distribution of fine-art prizes. M. Vaudoyer is the architect of the hall.

218. **Column at Rosbach** (October 28, 1806).—The Emperor has ordered the column erected by the Prussians at Rosbach, to commemorate their victory over the French, to be taken down and conveyed to Paris, in honour of to-day's victory of the French over the Prussians on the same field of battle.

219. **Corps Législatif. Laying the First Stone** (November 23, 1806).—Yesterday the President of the Corps

* A French foot equals 1.066 English.

législatif, accompanied by the members of that body in Paris during the holidays, assisted by the architect, M. Poyet, under whose direction the new front of the palace is being carried out, and in presence of the artists who will contribute to its decoration, laid the first stone of the building. Before doing so the President made a speech.

221. The Triumphal Arch of l'Etoile (December 25, 1806).—The Minister of the Interior has asked for some explanation with regard to the triumphal arch now building at Etoile. The foundations are progressing, and the design is not yet settled. The architects entrusted with the work have before them four designs, two with columns and two without; they have not agreed which to choose. The Minister has referred these designs to a commission of the Institute, the members of which are MM. Gondouin, Peyre de Fourny and Heurtier. The situation is delicate, as the commission will have to decide upon the designs of architects who are members of the Institute, MM. Raymond and Chalgrin, and they will require to have regard to their brethren as well as to the Institute. The commission have decided in favour of a design with columns of small diameter.

222. On the Progress of Building (January 3, 1807).—

Whether on peace or war he's bent,
His burning genius o'er him reigns;
He finishes a monument
In the same way as his campaigns.
Thanks to his magic strategy,
His course of action is so skill'd,
His works require more time to see
Than they have taken time to build.

From "Arlequin Confiseur," a piece played at the Vaudeville Theatre in 1807. These lines describe in a few words and very effectually the active influence of Napoleon* on the buildings executed under his direction.

228. Triumphal Arch of l'Etoile (March 1, 1807).—The three first courses (assises) are entirely in rough stone (en libages), under the openings as well as the piers, and are in random courses (appareillés accidentellement), in polygonal blocks like the streets of the ancients. The courses are each 18 inches high and will cost about 60,000 francs (2,400*l.*). The upper courses will be carried out in a similar manner, but to save expense the voids of the arches are filled up with Nanterre stone (moellons de Nanterre). This material is from a top bed (vergelé); it is shelly, freezes readily, and is not suitable for external work, but is excellent for foundations.

232. The Madeleine, by M. Vignon (March 14, 1807).—Imperial decree of March 14 for 51,000 francs (2,040*l.*) for the payment of the competitors for the Madeleine. His Majesty having seen at his camp the fourth design, has not confirmed the decision of the Institute awarding the execution of the work to M. Deaumont, and has entrusted M. Vignon with the execution of the work according to his design which gained the *proxime accessit*. M. Deaumont is to have an indemnity of 12,000 francs (480*l.*)

345. Estimate for Versailles (October 1, 1807).—M. Trepsat is the architect of Versailles. For the last three years he has superintended the slight repairs but nothing new. Notwithstanding this, the Emperor has asked M. Gondouin, member of the Institute, for an estimate (devis) for the repair of the Palace of Versailles. A staff of six surveyors, under this architect, has been employed during the last twelve months on this immense work. He is now at Fontainebleau for the purpose of conferring with His Majesty. The work will be costly and will be of no avail, as M. Gondouin has declared that he will not superintend the work. M. Trepsat cannot undertake it as he has a wooden leg. M. Brongniart is in the field.

Report on the Public Buildings of Paris (August 30, 1807).—After a grandiloquent introduction attributing the whole of the credit of new public buildings to the Emperor, the report proceeds:—The works at the Panthéon are in progress; the works at St. Denis are nearly completed; the buildings of Napoléon and of Napoléonville are going on. Several churches and many bishops' palaces have been restored in the provinces. The tomb of Desaix is placed on the summit of the Alps (see No. 178), which are no less astonished on seeing for the first time a monument from the chisel of our artists than they were at seeing what was equally unexampled, the passage of an army dragging its numerous artillery by hand.

347. Column of Austerlitz (October 8, 1807).—Column of Austerlitz, Place Vendôme, by MM. Gondouin and Lepayre (*sic*), architects. All the preliminary works and the masonry of the Place Vendôme column are completed. The work of covering it from top to bottom with bronze bas-reliefs is now in hand. Several of these bas-reliefs are already cast, and the others will be ready before the end of the winter. As is known, they will represent the heroic deeds of the Grand Army in the campaign against Austria. The subjects were selected by M. Denon, director-general of the Museum, and modelled by M. Bergeret, a young painter of distinguished

ability. Some persons apparently regret that marble was not employed instead of bronze, in imitation of the Trajan column. It is feared that the bas-reliefs will not be sufficiently detached from the background, but this fear is vain if, as is asserted, the bas-reliefs are to be gilded.

248. Villa Borghese, Rome (October 6, 1807).—The Emperor has purchased from Prince Borghese, who is now in France, the antiquities at his casino at Rome, for about 11,000,000 francs (440,000*l.*)

M. Cretel, minister of the interior, proposed to M. Dufour to go out and arrange the removal and assist at that operation, but he could not go. M. Quatremer could not undertake the work. The minister, by the advice of M. Alquier, the ambassador at Rome, commissioned M. Paris, architect, who is on the spot, and sent out M. Lorimier, an artist with whom he is friendly, to assist him. The latter has accepted and started.

252. Triumphal Arch of l'Etoile (October 18, 1807).—This arch was decided upon so promptly that the work was begun before any definite plan had been settled. The result has been that the foundations at the fourth or fifth course are too short, and fresh excavations have been made to lengthen them. The settlements (tassements) are unequal, the joints are not good, and the superstructure may suffer from this circumstance and may show cracks. The architects, MM. Raymond and Chalgrin, are still divided as to the columns. Shall they be detached or engaged? Why have two architects? Was there ever Tasso & Co. for a poem, Racine & Co. for a tragedy? Genius cannot work under compulsion or restraint; it should have free play, as its productions are often spoiled by persons who worry or thwart it.

254. Panthéon, St. Geneviève (October 25, 1807).—When the church of St. Geneviève was secularised in 1792 and converted into a Panthéon, the towers and small campanile (?) of the dome were pulled down. Soufflot's nephew built at the rear an open staircase to the vaults. Now that the Panthéon has been reconsecrated, M. Rondelet is building new towers for the bells, is covering the open staircase with a peristyle, and is about to rebuild the campanile on the top of the dome.

258. Triumphal Arch of the Carrousel and the Barrier St. Martin (November 15, 1807).—The architecture of the triumphal arch of the Carrousel is finished, but not the sculpture; it has been uncovered, however, to give a fête to the Imperial Guard on its return from the armies on the 25th instant. For this purpose M. Chalgrin is erecting a triumphal arch in wood at the Barrier St. Martin, for the entry of the Old Guard into Paris.

269. Pont St. Michel demolished (November 24, 1807).—The tender for the works for the demolition of the houses on the Pont St. Michel, amounting to 101,000 francs (4,040*l.*), was accepted last week, and the contractors undertake to complete the work in three months. Yesterday the workmen were already employed on the demolition. The cost was estimated at 66,000 francs (2,620*l.*), so that there is an increase of 35,000 francs (1,400*l.*) in the cost.

263. Tower St. Louis, at Brest (March 3, 1808).—M. Bernard, inspector-general of roads and bridges, who died at Paris on February 26, 1808, aged sixty-seven, executed various works. Among others, he restored the tower of St. Louis, at Brest, which overhung in a dangerous manner, to a vertical position. The Leaning Tower at Pisa and the tower of the Asinelli at Bologna might be treated in a similar way.

267. Triumphal Arch of l'Etoile (March 1, 1808).—The minister of the interior, M. Cretel, having appointed commissions on the several designs by MM. Chalgrin and Raymond for the triumphal arch of l'Etoile, the foundations of which are out of the ground, although the style in which it is to be carried out is not decided, has consulted separately by letter several architects to whom he has submitted on different days the drawings of MM. Raymond and Chalgrin's designs. He addressed the following questions to MM. Peyre, Celerier, Dufonruy, Vaudoier, Heurtier, Durand and Fontaine:—1. Should the work have three arches, one large and three (*sic*) small, or one large arch only? What was the rule generally followed by the ancients? How many triumphal arches are there with three openings, and how many with one opening? 2. Should the columns be engaged or detached? Are there any ancient examples to support either system? 3. Should there be four walls in front of the height of the stylobate? 4. And finally, what materials should be used for the stylobate as well as for the other portions of the monument. On March 1 the architects sent in their replies. They unanimously prefer an arch with a single opening and with detached columns.

March 3, 1808.—The minister of the interior, M. Cretel, presented to the Emperor MM. Chalgrin and Raymond's design for the Arc de l'Etoile, with an abstract of the architects' opinions on the subject. He would not follow any of these, and, to put an end to the great question, as to engaged or detached columns, has decreed that the arch shall be without columns, and the size considerably decreased, in order that it may be completed in a shorter time and reduce the cost;

* Compare Vaudoier's opinion with that in Note 175.

the opening will be decreased from 45 feet to 30 feet, and the other portions in the same proportion, which will reduce the size by a third and the cost from six millions (240,000*l.*) to four millions (160,000*l.*). Here we have a quarry of foundations as useless as they are costly, and a gateway very mean and paltry for the finest entrance to Paris. The mountain will have brought forth a mouse. Since the reduction of the gate the foundations formed in the void are not sufficiently forward; it will be necessary to remove the filling-in and replace it with stone.

(To be continued.)

GREEK ART.

At a meeting of the Odde Volumes, Chelmsford, Mr. F. H. Meggy read a paper on the "Incipience of Greek Art," in the course of which he said that in its incipient stages Greek art was undoubtedly inspired by the art of Egypt, Babylon and Assyria—in the first place probably through the tribes from whom the Greeks descended being brought into contact with the Phœnicians themselves, who early became intimately acquainted with the more ancient civilisations. The exhibition of the Phœnician temple treasures probably served as technical schools of art for the barbaric progenitors of the classic Greek. There might have been direct contact with Egypt so early as 3000 B.C., as Mr. Petrie's excavation near one of the pyramids of what he considered a settlement of barbaric Greek artisans taken in war seemed to be wonderfully corroborated within the last few weeks by Mr. A. J. Evans, who in Crete found Egyptian articles of the twelfth dynasty (from which he would trace the spiral motive in decoration to Mycenæ on the one hand and Ireland on the other) mixed with pottery marked like that found in Mr. Petrie's excavated settlement. With examples from pre-Homeric, the Mycænæan and later ages, and references to well-known examples in the British Museum, he briefly traced the progress of Greek art from the archaisms of lines and zigzags to the perfect delineation of the figure in painting or sculpture.

COMPETITIONS.

THE City Council of Coventry are about to invite designs for complete Municipal Buildings, which are to embrace the old historical St. Mary's Hall, and some other ancient buildings which have for many years been used for municipal purposes.

They invited, by advertisement, architects who had had some experience in similar work, and who were willing to compete, to send in their names with drawings or photographs of their executed works, and twenty-five names were sent in.

The City Council have selected eight of the applicants, who, together with any Coventry architects who might desire to compete, will be supplied with the necessary instructions and plan of the site available.

The City Council have been advised in the preparation of these instructions by Mr. Charles Barry, F.S.A., and have appointed him as their assessor in the selection of the best designs.

A premium of 150*l.* is offered for the best design and 50*l.* each to the authors of the designs adjudged worthy of the second and third place.

Designs are to be sent in on March 2, 1895.

As the new buildings will be carried out in sections from time to time as means become available, a special provision is made for a payment of 1½ per cent. to the architect appointed, or to his representatives, on the estimated cost of the unexecuted portions of his design if no orders for their execution be given within seven years from the award.

The committee of management of the West of England Eye Infirmary, at Exeter, are proposing to erect a new building on the site of the present premises in Magdalen Street, and in August last they invited architects to send in designs in competition on instructions issued.

These designs are to be delivered on November 30.

The committee have appointed Mr. Charles Barry, F.S.A., late president of the Royal Institute of British Architects, as their assessor to advise them in the selection of the most suitable design.

This competition to be a dual one. From the designs sent in at first (which are to be to a scale of 16 feet to an inch), not fewer than three or more than six will be selected by the assessor for the final competition (drawings to be 8 feet to the inch), and to each of the architects so selected an honorarium of 25 guineas will be paid.

The successful architect in the final competition is to be employed as architect to the building on the usual professional terms.

The work is intended to be commenced at once, but if its commencement should be delayed for two years after the

award, the architect is to be paid 100 guineas (in addition to the honorarium), and his designs will then become the property of the committee.

CHURCH BUILDING AND RESTORATION.

Heydon, Berks.—The fine old parish church of SS. Peter and Paul, which for the last few months has been undergoing partial restoration, was reopened for Divine service on the afternoon of Tuesday, the 20th inst., by the Bishop of Thetford, accompanied by the rector (the Rev. B. J. Armstrong), the Rev. A. H. Upcher (rural dean) and many of the neighbouring clergy, when, after a full choral service, the Bishop preached a sermon appropriate to the occasion. The principal works of restoration (which as far as possible have been carried out strictly on the old lines) have been that of the nave roof, the old timbers of which have been removed, cleaning and rinsing, however, such of the old as were practicable, the deficiency being made up with new timbers of English oak, the whole oiled and covered with oak boarding, recasting and relaying the lead, repair to the coping and parapets, new gutters, &c., reglazing the clerestory windows, and re-stuccoing the external walls. A new stair and handrail has also been supplied to the interesting old pulpit, and the sounding-board and pulpit itself have also undergone renovation. The south aisle has been laid with wood blocks and oak kerbs, the roof timbers repaired and covered with deal boarding, and restoration effected to the south porch, the roof of which has been releaded. Mr. J. H. Blyth, contractor, of Foulsham, has satisfactorily carried out the principal works, Mr. J. T. Gibson, plumber, of Norwich, executing the recasting and laying of the lead and also the glazing to the clerestory windows, the whole being under the superintendence of Mr. Herbert Green, architect, of Norwich.

St. Edmund's Catholic Church, Miles Platting.—The foundation-stone of this church was laid by the Right Rev. Dr. Bilsborrow, Bishop of Salford. The congregation, headed by the St. Joseph's brass band, walked in procession through the district. The architects for the new buildings are Messrs. Pugin, of London, and the contractors Messrs. Robert Neill & Sons. The total cost is estimated at about 10,000*l.* The new church will provide accommodation for 1,100 persons. It will be divided into five bays, each 25 feet long. In the bay at the west end the gallery will be placed, and another bay will be occupied by the chancels and side chapels. At the corner of Monsall Street and Mary Street a tower will ultimately be erected. The total length of the church internally will be 125 feet, the width 65 feet, and the apex of the roof will be 62 feet above the level of the ground.

GENERAL.

The Guardians for the Union of Merthyr Tydfil have recently selected from twenty-five other candidates Mr. E. A. Johnson, M.S.A., of Abergavenny, for the appointment of architect for their new infirmary which is to be built at Merthyr, at an estimated cost of over 10,000*l.*

Signor Ansiglioni, sculptor, who some years ago had a period of fame and fortune, has, it is announced, just died in poverty at Rome.

The Liver Sketching Club has opened its autumn exhibition with 252 works in oil and water-colours. The selection of works has been more than usually severe. Mr. John Finnie, the president, exhibits *Sundown, Autumn*.

A Partnership has been arranged between Mr. James H. Keats, of Plymouth, and Mr. E. Coath Adams, of London. The title of the firm will be Keats & Coath Adams.

The Conservative Club at the corner of Bothwell and Wellington Streets, Glasgow, was opened on Thursday. It was designed by Mr. R. W. Edis, F.S.A., and has cost about 33,000*l.* The style is Scottish Renaissance, and marble has been much used in the interior. Messrs. Wylie & Lochhead were among the contractors.

Mr. Burton Barber, the animal painter, died on Tuesday night.

The Designs by Messrs. Basil Champneys, Field, Jackson and Taylor, for the Hampstead Central Library, will be on view at the Vestry Hall, Haverstock Hill, from Tuesday to Thursday in next week.

Mr. P. H. Rathbone will read a paper entitled "The Economic Value of Fine Architecture" at a meeting of the Liverpool Architectural Society.

Lieutenant-Colonel Ford has put down on the notice paper of the County Council a motion asking the general purposes committee to consider and report on the feasibility and desirableness of securing a supply of sea water for London, with a view to its use for sanitary purposes.

The Architect.

THE WEEK.

THE decision which was given on the appeal of the Bromley Local Board, on Tuesday, will, we hope, convey a lesson of which several of the representative authorities in this country stand in need. The law has in many things given them almost despotic power, but when an authority will act like an ordinary individual it must expect to have no especial privilege. In the case in question the Bromley Board made an agreement such as one man might enter into with another man, and years afterwards tried to get out of the consequences by assuming all the majesty of authority. The facts were simple. In Bromley, as elsewhere, it was considered desirable to encourage building. The Board accordingly agreed that if a certain road were laid out to the satisfaction of the surveyor and kept in repair for six months it would then be taken over as one of the streets. The agreement, however, was not sealed, and the usual public notice was not given of the intention to adopt the road. Apparently there was a great deal of traffic, and as the Board neglected the road it fell into a state of disrepair. Six years ago the Board, ignoring what had been agreed, served notices on the frontagers ordering them to put the road into proper condition. As they did not obey the work was done by the Board. An action was afterwards taken to recover the money, but the county court judge held that the original agreement was binding, and that the frontagers were not responsible for the outlay. The Board appealed. Mr. Justice GRANTHAM said it was impossible to doubt, on seeing the agreement and the minutes of the Board, that it was intended to treat the road as a new road, and on the strength of the arrangement large sums of money had been expended by the frontagers. His lordship said the plea about the agreement not being under seal was immaterial, for the question was whether the work to be done by the frontagers had been accepted by the Board, and as that was decided in the affirmative by the judge of the Court, the case could not be sent back. The appeal was therefore dismissed. The case is one of those which are so often arising, in which the members of a Local Board appear to consider that the history of a town did not begin until they were elected. They reject all that was done by their predecessors in office. A little care in examining the minute book would have shown that there were no grounds for an action against the frontagers, but as long as the members of a Board are not held responsible for law costs which need not have been incurred, we must expect similar actions will arise.

It is gratifying to learn that the inadequate remuneration offered by the London County Council for the architectural work of the proposed asylum has not attracted applications from the class of architects who are competent to undertake the responsibility. One of the councillors at the meeting on Tuesday considered that some of the candidates were competent—that is, if judged by a readiness to accept 800*l.* a year salary, but another member declared they were all “entirely inexperienced, and would inevitably prove to be more expensive in the long run,” while some described them as “merely men who had no practical experience, but were simply theorists who knew nothing about the work.” The fact that so reckless a body as the County Council, who are willing to sacrifice all considerations to an apparent economy, hesitated about employing any of the candidates, testifies to their unworthiness. These gentlemen may, however, improve in time, and for that reason we do not intend to damage them by publishing their names, although they have not shown much *esprit de corps*. Having failed in their first endeavour the Council now propose to try the effect of another sort of bait. They offer 10,000*l.* instead of commission. As the building is estimated to cost 375,000*l.*, the rate of remuneration is only a little over 2½ per cent. If the building was of the warehouse class that rate might offer some temptation, but the asylum will

require constant care, and, under the circumstances, not much of the duty can be entrusted to a deputy. If architects will be firm, the County Council will be compelled to pay the established commission, and an evil precedent cannot be set up which will apply not only to municipal buildings but to those of private owners.

WHEN writing last week about the systematic efforts of the Germans in dealing with classic archæology, we refrained from pointing the moral by referring to the case of Sir CHARLES NEWTON. His death now allows the truth to be stated. When, in 1852, he was sent out to Mitylene as a vice-consul, the Government had decided on an experiment in imitation of what was done by the Germans. Accordingly, Mr. NEWTON was made a sort of representative. He succeeded in rescuing the remains of the Mausoleum; but his stay was only temporary, and Mr. PULLAN, who co-operated with him, possessed no official rank. The consequence was, that after their departure Halicarnassus relapsed into its ancient solitude. The Germans would have kept a succession of vice-consuls there, who would have aided inquiries, and the restoration of the monument erected by ARTEMISIA would have exercised the powers of most of the architectural students of Germany. We can show two unsatisfactory attempts. In 1860 Mr. NEWTON appeared as consul in Rome, but as he was removed in a year, he was unable to diminish the influence of the German Institute. The experience which was attained by him and by Mr. PULLAN was therefore no more than a temporary gain to the country, for neither of them was able to instruct a successor. Both men could have helped to set archæology on its proper basis, which is architecture, as the Germans are now doing in Greece and Italy. All Mr. NEWTON was permitted to do was to increase the collections of the British Museum, and although he was fortunate in acquiring bronzes, vases, gems, &c., it was impossible by their aid to give a true notion of archæology. What the mineralogical cabinets are to geology the sculpture galleries and vase rooms are to classic archæology. Hence it is that the true value of the Bloomsbury collections is only apparent to Frenchmen and Germans, for having commenced the study of archæology in a right way, they are able to perceive the relations of the sculptor's and potter's work to a higher art. But it is severe work even for them. As M. WEY says, “One comes out fatigued from the British Museum, and disposed to consecrate the rest of the day to *flânerie*.” Mr. NEWTON might have wrought many changes if the country was with him. He was born in 1816, and in 1840 he entered the Greek and Roman department of the Museum. He was appointed keeper in 1861, an office he held until 1885. If he desired he might have obtained the chief librarianship, for the Trustees were confident in his powers and especially his tact. Among his acquisitions were the gems belonging to the Duc DE BLACAS and the Castellani collection of bronzes and vases. He was elected professor of archæology in the University College, London, in 1880, and was the first to hold the office. He was the author of “Travels and Discoveries in the Levant,” “Essays on Art and Archæology,” and with Mr. PULLAN, “Discoveries at Halicarnassus.” Sir CHARLES NEWTON died at Westgate-on-Sea on November 28, and he was buried in Kensal Green on Tuesday last.

THE following officers of the Society of Antiquaries of Scotland were elected on Friday last:—President, the Marquis of LOTHIAN; vice-presidents, R. ROWAND ANDERSON, LL.D., REGINALD MACLEOD and JAMES MACDONALD, LL.D.; members of the Council, Sir GEORGE REID, LL.D., P.R.S.A., and J. R. FINDLAY (representing the Board of Trustees), J. BALFOUR PAUL, Major-General Sir R. MURDOCH SMITH, the Hon. HEW DALRYMPLE, ALEX. J. S. BROOK, Hon. JOHN ABERCROMBY, JOHN TAYLOR BROWN and CHARLES J. GUTHRIE; secretaries, D. CHRISTISON, M.D., and ROBERT MUNRO, M.D.; secretaries for foreign correspondence, Sir ARTHUR MITCHELL, K.C.B., M.D., LL.D., and THOMAS G. LAW; treasurer, J. H. CUNNINGHAM; curators of the Museum, Professor DUNS, D.D., and ROBERT CARFRAE; curator of coins and librarian, JAMES CURLE, jun.

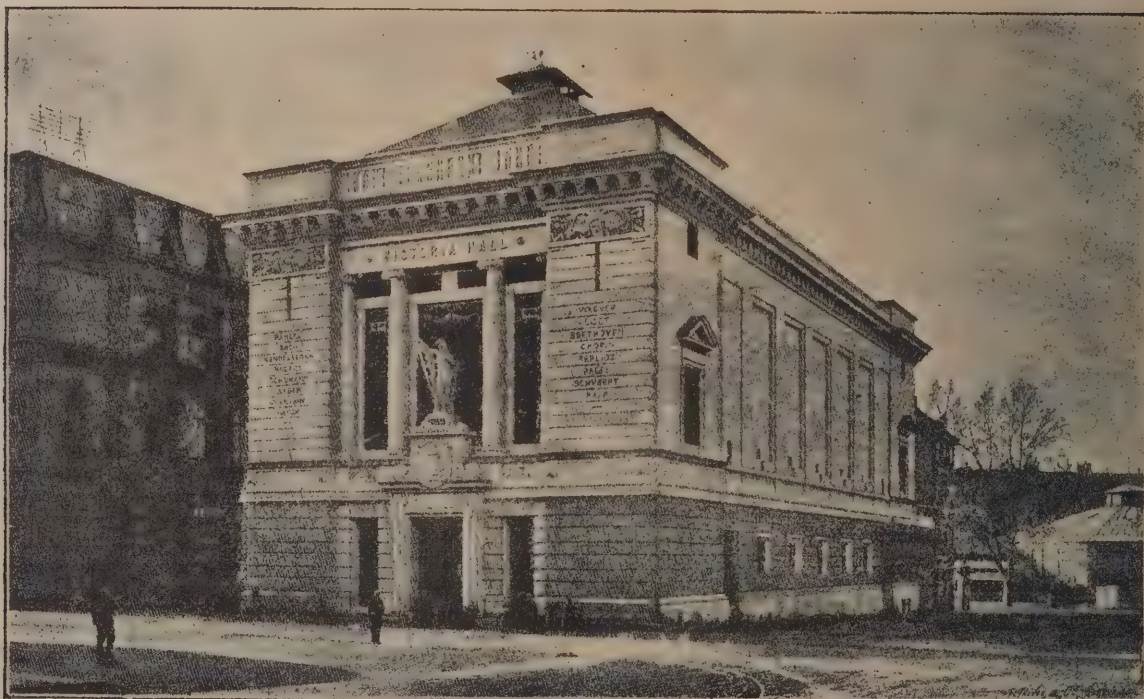
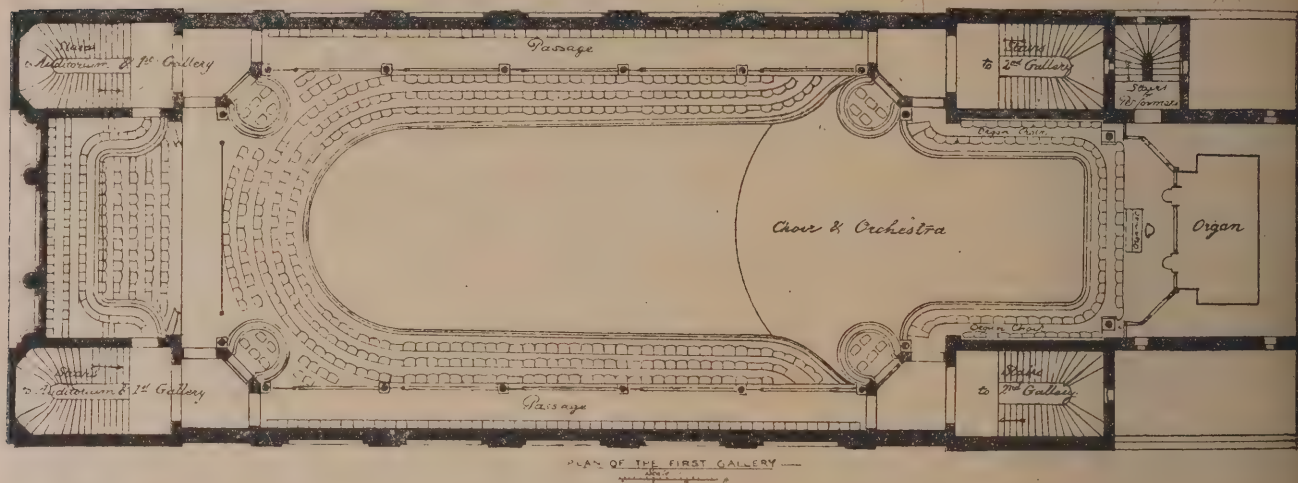
THE VICTORIA HALL OF GENEVA.

BY LAWRENCE HARVEY, F.R.I.B.A.

THIS building, which has just been completed, is perhaps the most perfect example of a concert-room extant. It is due to the munificence of Mr. D. F. BARTON, the British Consul in Geneva, who has spared neither money nor pains to make it what it is. The hall has had also the good fortune of being designed by the Brothers CAMOËTTI, architects of exceptional talent, as may be seen

galleries. To these proportions and general disposition of the space which gently rises from front to back are perhaps mainly due the exceptionally good acoustical properties of the hall; but there are refinements in the setting out of the galleries and seats which no doubt contribute to the satisfactory result. For instance, the plan reveals that the front lines of the side galleries are not parallel, but slope outwards as they near the stage. The figures marked on the working drawings show that the distance from the gallery to the centre line of the hall is 9 inches wider at the part near the orchestra than at the opposite end. Then the levels of

VICTORIA-HALL GENEVA



by the grand building for the General Post Office, which was erected from their designs and under their superintendence on the main thoroughfare which leads from the Geneva railway station to the harbour.

The hall is about 200 feet long, 62 feet wide and rather low-pitched. Both ends are narrowed to leave space for the four staircases, which give access to the auditorium and the galleries. The hall is also further narrowed by the

the seats have been everywhere set out on isacoustic curves, so that each seat offers the same advantages for hearing and seeing.

The photographic view of the interior gives an idea of the splendour of the decoration adopted. The style is no pedantic reconstruction of any particular epoch, but yet may be said to have been inspired by such examples as the interiors of the palaces of Fontainebleau and Versailles.

The ceiling is certainly according to the LOUIS XIV. precedents. The painting which decorates the central field of the ceiling is from the brush of M. BIELER, a Swiss painter. It represents the opposition of the matter of fact world in which we live with the realm of the ideal, and also of terrestrial with celestial harmonies—a kind of abstruse symbolism which is much in fashion with Swiss artists at the present time. To these explanations we may add that the tone of the colour decoration throughout is deep purple, crimson and gold.

The hall is lighted by 1,000 electric lights of 16 candle-power, of which 120 form a crown of iridescent carbuncles all round the ceiling. Besides these there are 400 similar electric lights for the passages, vestibules and other parts of the building. Arrangements have been made for three degrees of lighting. All the lights will be on for exceptional occasions, such as the inauguration of the hall or the reception of some honoured guest; a brilliant but yet reduced lighting will be used for ordinary occasions, and a still more modest display for such practical purposes as rehearsals, and so on.

A point to be well kept in mind by all architects who



may have the designing of theatres, concert-halls, or other places of public entertainment is the following. All the seats fold up automatically, arms as well as seat, when the occupiers rise, so that there are no impediments to the egress of the public. This is a feature which might advantageously be adopted even in churches and chapels.

As the building is surrounded on three sides by streets and yet has no windows, being lighted from above, it offers a good example of the architectural treatment of blank walls. The details of the architecture belong to the Classic Renaissance of the LOUIS XIII. period, but the spirit of the whole is distinctly Egyptian. The main entrance is flanked like an Egyptian temple by two massive pylons, which frame between them a rich colour decoration. This decoration is executed in a kind of paste which has all the hardness and durability of marble. It is the patent of the Cie. Industrielle Gènevoise. The door itself, which reminds one of some of the architectural features of the Palace of Fontainebleau, is decorated with the arms of the BARTON family, in which appear a boar's head, roses and fasces of arrows, bearing the motto "Fide et fortitudine." Above the door stands in the simplicity of EVE a huge and yet graceful embodiment of the spirit of music; she seems just

sprung from the waters, holding in her hands a harp covered with reeds. Three years ago this statue was exhibited in the Paris Salon, where it was much admired. It has the merit of being a novel treatment of a hackneyed subject and an acceptable relief from the ever-recurring Greek classic muse so dear to Philistines, of which there are not a few even in Geneva.

The sides of the building exhibit but large panels, with no other decoration than the good taste and proportions of the cornices and stonework. And here we beg those who see only the photographic view of the exterior not to form a hasty judgment, for we may say it appears on paper much smaller than in reality. The same observation applies to all buildings designed in the colossal Classic style—that is, in the style where the building is considered as composed of one order of architecture, such as the Victoria Hall and the Central Post Office in Geneva, and the buildings erected by MICHEL ANGELO on the Capitoline Hill at Rome. All these buildings look small in drawings and overpoweringly grand in reality, whereas the peculiar architecture of several of the most recent London buildings gains on being seen in drawings and photographic views where the smallness of the details cannot be gauged. But what a fall there is, what a deception, when we are face to face with the buildings themselves, with their gimcrack and petty details which we may carry off bit by bit in our pockets if we feel so disposed.

We beg London architects when they pass through Geneva to closely examine the construction of the two buildings we have named, for they will find that they are composed of boulders, each measuring about 6 feet by 8 feet by 4 feet and more. These boulders go right through the wall, forming a true isodomos stonework, as in the Parthenon of Athens. They are honestly what they appear to be, and not simply a 6-inch or 9-inch veneer, such as covers the so-called stone fronts of many London buildings. Absolute truthfulness seems a very difficult virtue to be faithful to in architecture as well as in morals, and the Geneva walls sin also in this instance, for they usually appear much less powerful than they really are. Here we constantly find the huge boulders which compose the walls worked on their face as if they were two or three courses of stone, a fact which a careful examination of the jointing will soon reveal.

It is curious to see how close is the connection between building and the character of the people who practise the art. In England, where we use sham stone fronts, keeping up appearances—that is, trying to seem wealthier than we really are—is the great social law. In Geneva it is just the reverse; people do their utmost to seem poorer than they are, and thus both nations deceive one another.

It will be noticed in the plan that the stairs exhibit peculiar curves in some of the steps. Thanks to this device, which is well known in French work, the stairs gain a very easy ascent. To my old pupils of the classes of masonry, I may say that these steps are first set out on the principle of the dancing stairs, of which we have constructed a model last year at the Guilds Institute, and then the line of the nosing of each step is deflected so as to bring the inner end normal to the well-hole and the outer end normal to the wall-string.

Such are some of the lessons to be gathered from the new hall erected in Geneva by one of our own countrymen to serve as another connecting link between Englishmen and Genevese, who can reckon already more than three centuries of fast friendship.

Before closing this communication, I wish to say something about the principal artist who conceived and executed this noble work, for, alas! he departed from the scene of his labours too soon to see the Victoria Hall completed. His name is JOHN CAMOLETTI, born in 1848, deceased six months ago.

To our young colleagues, who hanker after studies made easy by the establishment in London of a great school of architecture, such as the Ecole des Beaux-Arts in Paris, we may point to JOHN CAMOLETTI, who became one of the greatest architects of the age without ever having attended any school whatever beyond the primary or Board school of the village in which he was born. So true it is that it is native genius and not training that makes the artist. He did what many an English lad has done, and is doing now. He entered an architect's office as office boy, and from this

humble beginning steadily worked up his way to the highest round of the ladder. This shows that our English way of letting everybody fish for himself as best he may, with little or no external help, is not such a bad one after all. If it does not raise unartistic incapables into decently mediocre architects, like the French school training, at least it does not cramp with its ready-made formulæ heaven-born genius. This is the last and perhaps not the least lesson which the Geneva Victoria Hall is capable of teaching us.

Geneva : November 28, 1894.

BYGONE SURREY.*

SURREY presents within its limited area more contrasts than any of the larger English counties. The northern part is metropolitan and cockney, while elsewhere it merges into the rusticity of Hampshire, Sussex and Berkshire. "As high as Crooksbury Hill," says COBBETT, "expressed the utmost degree of height," and from what we have seen of them we believe there are people still near that pleasant spot whose notions of mountains are no less simple. To some of them a visit to London is as eventful as it was to their grandfathers. In all Europe there are no more squalid places than are to be found about Southwark, while there are many other parts of Surrey so delightfully picturesque that several LINNELL families could find employment in painting them. It was the remarkable variety of Surrey which struck travellers in the old days, for, says AUBREY, "it has been likened by some to a coarse cloth with a rich bordure or fringe, the inner parts being less fruitful than the skirts."

From its position Surrey was not, however, adapted to be the theatre of many great events. It was too near the city to be suitable for plots of any kind, although that of the barons against King JOHN came to a victorious end in an island forming part of Egham parish. The history of Kingston-on-Thames, if we were acquainted with it, might have been eventful, but the Saxon kings did not possess a Court newsman. "Bygone Surrey" does not, therefore, suggest epic themes. It produced many great men, but what was memorable in their lives was performed beyond the boundaries of the county.

The editors of the volume about Surrey, which forms part of a "Bygone" series that is produced in Hull, have to be content with such peaceful and homely subjects as the following:—"Historic Surrey" (in which it is admitted that no very important events can be recorded), "Primitive Surrey," "Lambeth Palace," "The Dialect of Surrey," "Ancient Roads and Ways," "Folk-lore and Local Customs," "Southwark in the Olden Time," "Mediæval Croydon," "Wanborough," "Battersea and Clapham," "Nonsuch," "Notes on Guildford," "A Forgotten Borough," "Early Surrey Industries" and "Bygone Merton." All these are excellent subjects for essays, and what is said about them may reveal to many that Surrey still presents much which is worth the consideration of studious men.

To Londoners the essay on Lambeth Palace, by the Rev. J. CAVE-BROWNE, will be particularly attractive. Many of them who appreciate the antiquity of the buildings may not understand how the Archbishop of Canterbury gained a footing so near Westminster. The site was presented by EDWARD THE CONFESSOR to his sister, who transferred it to the see of Rochester. As the land was marshy and unprofitable, there was no difficulty set up when the far-seeing Archbishop BALDWIN offered to exchange some pastures at Darenth for it, in order that he might erect the residence which was needed for him as chief justiciary of the kingdom, and which would allow him to be freer from local influences than at Canterbury. But it was not easy to be a reformer in the twelfth century, and BALDWIN preferred to join the Crusaders rather than realise his plans at Lambeth. HUBERT WALTER, the prelate whose name is associated with important events of the reign of RICHARD I., was hardly more fortunate. The monks of Canterbury feared the loss of some of their privileges if a building were erected which could be used

for an independent chapter-house, and the supreme authority in Rome agreed with them. The walls were, therefore, demolished. After a long delay the buildings were again undertaken by another prelate. In the latter part of the thirteenth century the buildings appear to have been neglected, for URBAN IV. issued a mandate ordering them to be repaired or renewed. The turret staircase was among Archbishop LANGTON'S additions, and when other parts were cleared away by Archbishop CHICHELE in the fifteenth century it was preserved. Much of the interest attached to the palace arises from the room known as the "Lollards' Prison," and views of it are given in illustrated descriptions of London, with a martyr for conscience' sake chained to its walls. There is no evidence that a Lollard was ever confined in Lambeth, "nor was the tower," says Mr. CAVE-BROWNE, "ever associated with the name of Lollards for at least three hundred years" after their time. That is not the only illusion about the old sect. In the floor of one of the upper rooms there is an opening, and the official showman used to suggest it was made for the purpose of getting rid of the Lollards by turning them into the river. The fatal passage is, however, only a substitute for a Lambeth glazed drain-pipe. The palace, like many another building, has secured interest under false pretences. Although there are no tragic associations around it, the great hall now, used as a library, is the most satisfactory part of the group. Yet it also is not free from being a sham, for it is not so old as it looks. PEPYS was not far wrong in calling it "a new old-fashion hall." The old hall was demolished in 1648. When JUXON, who accompanied CHARLES I. to the scaffold, became Archbishop, he appeared to be under the obligation to reconstruct the hall, and as faithfully to the old lines as was practicable. In order that his death might be no obstacle to the completion of the work, he made a will with the following clause:—"If I happen to die before the hall at Lambeth be finished, my executor to be at the charge of finishing it, according to the model made of it, if my successor give leave." It was not easy to imitate Gothic in those days, and JUXON had to expend more than 10,000*l.*, which was equivalent to an expenditure of ten times that amount in our time. One of the windows was made up by Mr. BLORE, an architect who restored without destroying, out of fragments of ancient glass discovered in other parts of the palace.

The palace at Croydon was another residence of the Archbishops. Mr. KERSHAW says it dates from 1273, "and on this their country abode some of the architect Primates bestowed much loving care and skill." There is much else in Croydon which tells of archiepiscopal power, and great industry has been shown by Mr. KERSHAW in unravelling the history of "Mediæval Croydon."

Neither Lambeth nor Croydon can be considered as bygones, but that title is applicable to the royal residence "Nonsuch," which is also described by Mr. KERSHAW. The design is ascribed to ANTHONIO or TOTO DELL' NUNCIATA, a Florentine, and it appears from the records of the Huguenot Society that an ANTHONY TOTO and his wife lived at Mitcham. The building, if we can rely on the old views, was not Italian in style, but rather a foreign interpretation of the English style, and we can imagine that the arrangement was due to HENRY VIII. So corpulent a king was not likely to admire grand stairs, and accordingly the greater part was only one storey in height. But as the views around were enjoyable, there were towers available for all who cared to climb. HENRY VIII. was not inclined towards moderation, and having decided to employ mythological figures in decorating the building, they were introduced wherever there was a spot to sustain a statue or a blank space to contain a picture, relief, or plaque. CAMDEN wrote:—"It has such a profusion of animated statues and finished pieces of art rivalling the ornaments of ancient Rome itself that it justly receives and maintains its name from them." Long afterwards, in 1665, when Nonsuch had declined, and the brilliancy of painting and gilding succumbed to the influence of the English climate, we find Mr. PEPYS testifying that it was "a fine place." According to him, "all the house on the outside filled with figures of stories and good painting of RUBENS's or HOLBEIN's doing, and one great thing is that most of the house is covered, I mean the post and quarters in the walls, with lead and gilded." There is much interesting informa-

* *Bygone Surrey*. Edited by George Clinch and S. W. Kershaw, M.A., F.S.A. London: Simpkin, Marshall & Co. Hull: W. Andrews & Co.

tion about the erection of the house in Mr. KERSHAW'S essay. After the King's death Nonsuch became the property of the Earl of ARUNDEL, from whom it was purchased by Queen ELIZABETH. The peculiar appearance of the building is suggested by the story that on seeing the metal on the roof, and it may be elsewhere, illuminated by the sun, the Queen imagined there was a conflagration. As her infallibility could no longer be accepted at Nonsuch, ELIZABETH was disgusted with the building and no longer resided there. Out of loyalty few writers of that age cared to extol the place. In course of time Nonsuch, having fallen from high estate, was used, like Hampton Court at the present time, as a retreat for courtiers. The report of CROMWELL'S surveyors in 1650 is complimentary to the buildings in spite of the Royalist associations. The gatehouse is said to be "very strong and gracefull," with rooms that were "very pleasant and delectable for prospect." In another part the lower storey is said to be "well-wrought freestone and the higher of wood," richly adorned and set forth, and garnished with variety of statues, pictures, &c. CHARLES II. does not seem to have valued the place, and apparently the buildings were used for stores. Hence it was that when the fire of London caused alarm in Whitehall and Westminster, the public money was put into vessels or strong boxes for despatch to Nonsuch. Afterwards the King gave it to his despotic favourite, the Duchess of CLEVELAND, from whom it was bought by Lord BERKELEY, in order that it might supply materials for a new house, "The Durdans," near Epsom, which was burnt in 1764. Of the fantastic Nonsuch not a relic has survived. On the ground now stands a house designed by JEFFRY WYATVILLE.

Surrey could hardly fail to be sought after as a dwelling-place. As many of the residences belonged to men who were notable, the number of names introduced in "Bygone Surrey" is remarkable. BOLINGBROKE'S "Cedar Chamber" still survives. An oval room in a house belonging to Mr. THORNTON, on Battersea Rise, was designed by WILLIAM PITT. MACAULAY, in his early days, lived and was taught at Clapham. Sir CHARLES BARRY spent his later years in the Elms House, Clapham. Bankside, Southwark, was the home of the Elizabethan drama, and to many it is the sacred spot in England, but there is nothing left in wood or stone which can be traced as having a connection with one of the poets or players. CHAUCER has also identified himself with Southwark. But if we were to enumerate all the celebrities that were connected with the little county we should require more space than is at our disposal, and it will be better to send our readers to the interesting little volume which Messrs. CLINCH and KERSHAW have been enabled to produce.

TRAINING OF ARCHITECTS.

THE first lecture of a course on the "History of Architecture" for the present session has been delivered by Mr. Arthur Hill, B.E., F.R.I.B.A., at the Queen's College. He said:—Before commencing the subject-matter of these lectures a few words on the training of an architect may not be astray. In the first place, we need some definition of architecture itself before any attempt can be made to say how it should be studied. Painting, sculpture and architecture are sometimes called the "three sisters," implying a similarity of characteristics that do not exist, for it is impossible to compare the freedom of the painter or the sculptor with the subservience to practical considerations that always governs architectural work, a control that often renders the development of artistic qualities more difficult than in the cases of painting or sculpture. All building from its nature must be scientific, therefore architecture must be regarded as a science, and as a science as well as an art. Architecture without art is mere building construction. A building may be admirably put together, every brick serving its purpose, the doors wide enough, the windows admitting sufficient light and properly weather-tight, yet the whole pile may be so utterly uninteresting that no one would look at it a second time except to wonder at its ugliness, while you can imagine another building with equally convenient doors and windows, yet possessing something in its grouping or proportions that converts it from a lifeless pile of bricks into a work of art, fascinating the observer and compelling his admiration. In an architect's training this two-sided characteristic of his profession must never be lost sight of, the artistic strain should neither dominate nor be crushed by the constructive, but both should be developed side by side.

Until quite recently the necessity for any special training for architects was not recognised. The action of the Royal Institute of British Architects in requiring its members to pass an entrance examination has brought the matter forward, and now in several places efforts are being made to meet the obvious need, but nowhere, so far as I know, has the co-relationship of science and art in the same school been thoroughly carried out. We have science schools without art and art schools without science. The engineering course of the Queen's Colleges was arranged fifty years ago, at a period when there was very little appreciation of art of any kind; and though admirably adapted for the needs of that day, the great era of railway making, it is not broad enough for the culture and artistic development of the present day, nor sufficient for those who are destined to practise the art of civil architecture.

From the moment one begins to build, to rear an edifice of any kind, whether of brick or of iron, the building should not only be structurally sound, but should also in some degree minister to that inherent love of ornament which is strong in the human race. I look forward to the development of an architectural school in this and other universities which would take its place side by side with the engineering school and supply an important link between the arts and sciences—a link that would tend to make engineers more artistic and architects more scientific. But there is no use referring further to existing deficiencies in the means of education; it will be more useful to take the existing opportunities. In Cork there are two institutions where the basis of an architect's training may be obtained, namely, the Queen's College here and the School of Art. Although the work in these two institutions is not linked together as would be desirable, yet the educational opportunities in Cork are not at all to be despised, and present an extensive field to any industrious student. An exhaustive knowledge of materials is the beginning and end of an architect's training; he should not only be conversant with the best and customary methods of construction, so that all materials may be brought into service in the most scientific way, but he should also possess a more technical knowledge of the characteristics they possess, so that from an artistic point of view they may be made to bear suitable and appropriate ornament. The School of Engineering is designed to deal with materials and structures from a purely scientific standpoint, and a student could not spend his time more profitably than in attending the engineering course, which contains a great deal that is essential and scarcely anything that is unnecessary for an architect to know. He should for the development of his artistic faculties attend the School of Art at the same time, and endeavour to obtain the power of expressing form in every possible way, not only in outline, shading and colour, but also by modelling in relief. With respect to the special course of lectures on the "History of Architecture," it would be the lecturer's object to show what the combination of art and building construction has accomplished from age to age in many different parts of the world. A knowledge of the historic styles of building and ornament, together with some idea of archæology, is quite as important to an architect as any other branch of study that can be named, not as an end in itself, but as a means to an end. The most perfect familiarity with the appearances and details of all the great buildings of Christendom will not make an architect. One must go beyond the mere features of a building as it stands, and ascertain how and why it has attained its peculiar form, and to what elements it owes its beauty, whether it is due to size or proportion, to the variety or unity of its parts, to elegant simplicity or rich ornament. Nothing can be more instructive than a consideration of the way in which difficulties were overcome and the various wants of mankind supplied. The lecturer then proceeded to illustrate the Doric architecture of Greece, and with the aid of two lanterns exhibited some excellent photographic views and diagrams. This mode of showing two pictures at the same time afforded excellent opportunities for comparing and contrasting different buildings.

THE PROPOSED CHRIST'S HOSPITAL SCHOOLS.

BY direction of the Council of Almoners a statement on the work of Christ's Hospital for the three years 1891-93 has been submitted for the information of the Charity Commissioners. Although considered by the Council in February and March, its publication has been delayed and indeed many of the matters referred to in it are still incomplete, and are likely to be so for some time. The new scheme for the administration of the Hospital became law on August 15, 1890, but the Council of Almoners did not have control of its affairs until January 1, 1891. "From the first," says the report, "the work of the Council has been very seriously hampered by financial difficulties. The income from donations and legacies, which

had been gradually decreasing since the passing of the Endowed Schools Act, 1869, has now practically ceased, the only receipt from this source since the passing of the scheme being a donation of 500*l.*, in respect of which the donor has been elected a Governor. As all donations and legacies received have now to be invested, they can no longer be treated as income. During the year 1890, stock was sold to the value of 9,823*l.* 2*s.* 2*d.* to meet liabilities, and although there was a balance carried forward to 1891 of 3,752*l.* 6*s.*, 3,721*l.* 18*s.* 2*d.* of that amount actually belonged to the old governing body, so the year 1891 was practically commenced with no balance in hand. The income available for school purposes in 1891 (exclusive of the exhibitions fund) was 47,668*l.* 14*s.* 2*d.*, and the expenditure 57,777*l.* 7*s.* 9*d.*, a difference of 10,108*l.* 13*s.* 7*d.* To meet this deficiency, and to provide for current expenses, stock was sold the following year realising 12,073*l.* 10*s.* The income for 1892 available for school purposes was 50,118*l.* 6*s.* 5*d.*; and by strict economy and the reduction of the number of children the expenditure was reduced to 52,343*l.* 16*s.* 6*d.*, showing a deficiency of 2,225*l.* 10*s.* 1*d.* The contributory clause of the scheme has done very little to help the Hospital's income.

"The scheme requires that the Council of Almoners shall provide upon convenient sites buildings suitable in the case of the boys' school for 700 boarders, in the case of the girls' school for 350 boarders, and in the case of the preparatory school for boys for 120 boarders. In choosing a site the Council decided it would be to the advantage of the foundation to secure at the outset a sufficiently large area to enable them to extend the premises if necessary hereafter, and to reap any advantage there might be in disposing of the surplus land at a building price. From the numerous offers submitted from time to time a committee of the Council put on one side those which from the limited size of the estate, the situation, the soil or the price did not appear to be suitable for the Hospital's purpose and they visited upwards of forty properties, which seemed from the plans and particulars furnished likely to meet the Hospital's requirements. Upon the recommendation of this committee the Council, on June 1, 1892, decided to negotiate for the purchase of the estate of the Aylesbury Dairy Company, near Horsham, at which the line of the London, Brighton & South Coast Railway branches to Brighton, Portsmouth and Guildford. The company have agreed to build a station on the estate, and to give cheap fares and exceptional facilities for reaching it. The property consists of nearly 1,100 acres, and is situated on rising ground commanding varied and extensive scenery between the Surrey Hills on the north and the Sussex Downs on the south, and possesses natural advantages which render it valuable for the purpose required. The Council having resolved that it is desirable that the London school should be vacated at the earliest possible time, a committee has been appointed to consider the best means of dealing with it, so as to provide funds for the erection of the new buildings, and for carrying on the schools until such buildings are ready for occupation. They have reported that it would be a pity to force the Hospital's site into the market, and that it would not be politic to advertise until some arrangement has been come to with the Governors of St. Bartholomew's Hospital, who are willing purchasers of a portion of the site. The Council have authorised negotiations with the Governors of St. Bartholomew's on the principle of arbitration, and have ordered that the remainder of the site be planned out by a competent architect for letting in building plots, that it be carefully valued, and that offers be then invited either for the sale of such plots or for taking them on building lease.

"Mr. Rogers Field was asked, on November 10, 1893, to report upon the water-supply and drainage of the proposed new schools, and he advised, on January 10, 1894, that a boring be sunk to ascertain the quality of the water in the Tunbridge Wells Sand lying beneath the estate, the supply from the present shallow wells being surface water and liable to contamination. He also suggested means for the disposal of the sewage and the drainage of the estate. A report on the general healthiness and sanitary condition of the district of Stammerham and Itchingfield, and its suitability for the purposes of a large school was received on March 27, 1894, from Dr. Charles Kelly, the medical officer of health for West Sussex, who reported 'that the conformation of the land, the free exposure to air currents, and the open sunny aspect of that portion of the Mid-Sussex Railway render it very suitable for building purposes.' A special committee of the Council have the reports of Mr. Rogers Field and Dr. Kelly under careful consideration, and have reported that the statistics of diseases adduced by Dr. Kelly remove sufficiently the apprehensions which might have been entertained in consequence of Mr. Rogers Field's analysis of the soil, and that the Council would be justified in acting on Dr. Kelly's conclusion, that 'the estate is suitable for the purposes of a large school.' This report was adopted by the Council on May 2, 1894, and in accordance with Mr. Rogers Field's advice, a boring was sunk from the bottom of the Dairy Well, at Stammerham. At a depth

of 212 feet from the surface hard beds of ironstone rock and blue shale were found. The quantity of water in this stratum was tested, and after a week's continuous pumping with a 6-inch pump the yield of the borehole, 150 feet from the surface, was found to be 30 gallons a minute. The boring is being proceeded with, and a sample of the water has been sent for analysis.

"The judges made their award in favour of the design submitted by Messrs. Aston Webb & E. Ingress Bell; and recorded their unanimous opinion that such design most closely fulfils the instructions, is the best in point of arrangement, is the cheapest to carry out, and is on the whole the most suited for the Hospital's purpose. The design has been referred to the building committee with instructions—(i.) To prepare and consider an approximate estimate of the probable income and expenditure of the foundation for the next six years (on the assumption that the buildings will be proceeded with), and of the number of children that can be maintained and educated in the meantime and afterwards; and (ii.) To consider what alterations are necessary in the design, and how it can best be modified in view of the Hospital's finances, and to report."

THE NEW BOY-ARCHITECT.

THE members of the Northern Architectural Association held a meeting in Sunderland on Saturday night last, when Mr. Frank Caws read a paper on "The Architect." The chair was taken by Mr. Wm. Milburn.

Mr. Caws said he addressed himself to the youngest members especially, and would express to them, as well as he could, the true architect as he appeared to his vision. In order to become an architect worthy of the name a boy must have at the start much more than the average measure of passion for the beautiful and of perception of the true, and moreover he must cultivate these gifts with more than ordinary assiduity and more than common delight. It was a fair subject for discussion, which of the two gifts, if either—the practical or æsthetic—should take precedence in the training and development of the boy-architect. Did not Nature teach them not to try to force the mind of the young boy-architect to become severely practical before the proper time? Did not all boys become naturally more practical as they grew older? It must be admitted, however, that circumstances altered cases. The boy who was too prosy should be urged on the æsthetic and discouraged on the practical side of his tastes, and he who seemed too excessively romantic should be earnestly exhorted to become more practical. Still, after making every allowance for the special circumstances of each case, he held strongly that, generally speaking, they should give precedence in youth to the poetic faculties, because they were the more sensitive to injury from discouragement and neglect, and in the order of Nature their turn came first. To cultivate, exercise, enlarge, strengthen and refine that human-divine gift which we call soul, the youth must not be kept for too many weary weeks together merely making plans and tracings of hideous rows of street houses or workmen's dwellings, nor at the squaring, day after day, of endless columns of duodecimals, nor in running to and fro perpetually to corporation officials about drains and middens, though it followed that attention to duty, however disagreeable, was of all lessons the one he must most thoroughly acquire if he would preserve his soul's best self alive; and, moreover, the very dryness and distastefulness of some of his duties would serve as a foil to render all the more intensely enjoyable those of his studies which were of a more artistic complexion. He must read noble and inspiring books, he must watch sunrises and sunsets, he must not spend all his time poring indoors nor half his time sporting out of doors. If he was first class at football he would not be likely to be first class at architecture. He must be meditative, wandering in the fields and on the sea-beach to fill his eyes and heart with the lovely coquetry of sunlight and shadow, and growing increasingly familiar with Nature's harmonies, discords, mysteries, and romances. He must frequent cathedrals, and learn to sit still in quiet churches. Frequent attendance at music-halls and theatres was calculated to excite unduly and artificially the taste for the beautiful, and to induce a mental unrest which rendered the boy architect less in tune for his normal studies and observations. His taste should be based on the solid and the really enduring rather than on the ephemeral creatures of Art and Nature. Without being nervously anxious and overwrought, the young student must be quietly in earnest. The mental organism of the boy architect was to be so specially devoted to the service of Beauty and Truth that even in the innocent pleasures of theatre, concert, or football field—indulged in to excess—he might deviate rather than refresh the energies of that brain and soul, and fail of attaining the standard of excellence which was the high mark he aimed at. Utilitarians might ask, "Why should young architects, who will never have the ghost of a chance to build a cathedral, spend so much time and thought on cathedrals?" It was not that they might be

equipped for designing cathedrals—though who could tell that they might not be called upon to do so?—but that they might become so imbued with the spirit of holy beauty that it might in the after years of their early manhood inspire and pervade all their efforts, even in the designs which they were employed to make for much humbler buildings. Similarly, the boy architect should be keenly alert to study the ever-changing glories of the sky, with “its gorgeous towers and cloud-capped palaces” of mist and flame, not that he might design and build moonrises or sunsets, but in order that his soul might be refreshed and strengthened to withstand the chill and deadness, the blight and mildew, with which, too often, a money-grubbing and abidly utilitarian age infected the young and unfilled spirit, robbing enthusiasm of its edge and cankering its brightness. In this work-a-day world the boy architect must needs, by communion with all that is nobly ideal in Literature, Art and Nature, so confirm his own inborn idealism that he might to the end of his career continue to be a great dreamer as well as a great realiser. No man who is not a dreamer is or can be an architect. He must learn to express what he feels. Let him attempt to do so while as yet his eye was not skilled to instruct his hand, and while as yet his ear had not learnt to direct his tongue. The proper medium of expression which the young architect must bring into subjection to his thought was not the tongue, but the hand, not the word, but the line. All his dream power, let him strengthen and refresh it as he might, would be wasted if he did not at the very beginning learn to draw. Some of the greatest orators had known only their mother tongue. Likewise some of the greatest architects had been proficient only with the pencil and pen. But if the architect was able also to draw with brush and colour, with modelling tool and with clay, and with carving blade and wood, so much the better, just as the linguist orator was better furnished than he who was master only of one language. Before the young architect could hope to draw his dream, which was unseen, he must learn to correctly portray the dreams of other architects which had been petrified into solid substance and visible forms. No power of imagination, no strength of conception could compensate the architect for weakness or non-proficiency in the art of drawing. The young architect should talk little and draw much. He should have no mercy on himself short of acquiring that absolute harmony and working understanding between eye and hand, by which alone his thoughts could take shape and permanency. Having by severe self-criticism, an essential habit to the successful student, and by untiring dogged perseverance become, at a comparatively early stage of his education, an accomplished draughtsman, a young architect during the same period of preliminary training must necessarily have become proficient in the science and practice of linear perspective. The genuine architect always, he said, thinks in perspective, while the self-styled architect thinks in mere plan or elevation. In order to transfer his dreams from paper to timber, brick, iron and stone, the architect must further learn how to draw, so to speak, with the plane, trowel, hammer and chisel, his pictures in the open air, by the hands of the carpenter, bricklayer, smith and mason. To do this he must acquire practical and scientific knowledge. He must become a geometrician and mathematician. He must also become a man of business. The motive was sufficient. The student would come to understand that nothing short of perfect artist plus perfect engineer could constitute the perfect architect. He would understand that the true architect was the priest whose high vocation it was to wed fancy to fact, to unite beauty to utility. There was a danger that the fascination of pursuing the manlier functions of the engineering part of his profession might render him a mere materialist, the ideal being overshadowed and absorbed in the real. He was therefore called upon for the remainder of his career to be on his guard against allowing either of the functions of his dual nature and office to get out of proportion and adjustment and usurp the rights of the other. It was a question of focus. So long as he succeeded in so governing and balancing the two influences of which his work was the outcome, he remained an architect. That was to say, so long as he continued to both dream and build he remained a creator. So long as he could only dream he was an impotent ghost. When he could both dream and draw he became what the theosophist would call an “astral body,” an artist—a cross between a ghost and a man. But when he could dream, draw and build, and could, moreover, continue to do so, maintaining in spite of the materialising influences and the commercial duties of his daily life as a busy man of affairs the proper balance and equipoise of all his natural endowments and accomplishments, he was and remained—at least in his (the speaker's) regard—that most completely developed man of all sorts and conditions of men, the architect.

A discussion followed, and the meeting closed with votes of thanks to Mr. Caws and the Chairman.

The Sales at the Glasgow Water-Colour Exhibition have made up a total sum of 1,544*l*.

TESSERÆ.

House of Honour, Peterborough.

THERE is a very common popular delusion that Gothic architecture was used for churches and chapels and monasteries only; but this is altogether a mistake, arising from the fact that our houses have generally been rebuilt by each succeeding generation according to their own ideas of comfort and convenience, while our churches have remained as they were built to a great extent. In consequence of this error, whenever a Gothic window is seen in any old building or ruins it is immediately called a church or chapel window, although it is quite often the window of the hall; there is, in fact, no difference externally between the window of a church and of a hall of the same period. Internally there are usually seats in the recess of the hall window for ladies to sit and work at their tapestry; this is often the only distinction between a hall and a chapel when the traces of the altar have been destroyed. Within the precincts of the great monastery of Peterborough, in the most retired part, close to the east end of the infirmary chapel, there still remains a small Early English house of about 1220, nearly perfect, with windows having remarkable plate-tracery in the heads. It is supposed by Professor Willis to have been the “House of Honour,” or guests’ house; or it may have been the house of the infirmary, who was an important officer in the larger abbeys. The house is divided into two parts by a partition wall, on one side of which is the hall, which is the whole height of the building; the other half is divided into two storeys by a floor, and this is part of the original design, as shown by the doors and windows.

Late Perpendicular.

The Perpendicular style is frequently assumed to terminate with the reign of Henry VII., but this is an error, though a very common one. Buildings assigned to Henry VII., on account of their being Gothic, are very often really of the time of Henry VIII. Although the Renaissance style had begun to come in, it went on very slowly at first, and very good examples of the Perpendicular English Gothic are preserved both in churches and in houses, not only of the time of Henry VIII., but later also, and many large buildings begun under Henry VII. were not finished until Henry VIII. or later, as at Windsor, at Oxford, and in Cambridge and Somersetshire, to a remarkable extent, and in many other counties. It appears that when the monks saw the probability of the abolition of their tenure, they spent as much as possible in building and ran into debt largely in doing so, in order to evade the loss of property in the expectation that the storm would blow over, and that their successors would benefit by the sacrifice they made. When the royal commissioners took possession of the monasteries, they frequently found a large number of buildings only half finished, and heavy debts to be paid off before any residue could be found for the commissioners to sell.

Cicero and Amateurism.

Cicero, in his second oration against Verres, speaks of objects of art as contemptible, and says that the forefathers of those whom he addressed allowed the peoples whom they had made tributary to retain them as an amusement and consolation in their slavery. In a curious passage in the “Paradoxa” (v. 2) the orator, enraged probably at seeing that the taste for these puerilities grew and increased around him, brings forward the very strange argument that, as in a house the slaves who were entrusted with the care of the objects of art held the lowest rank, so those who passionately loved such objects were in the lowest depth of slavery. It is, however, only just to Cicero to remember that Roman luxury easily ran riot, and that the crimes which Verres, the great collector of the day, had committed in amassing the treasures of art which he possessed, and doubtless the extravagant and affected admiration of the adulators of Verres and such as Verres were reasonably offensive to the patriotic statesman. Cicero himself did not wholly escape from the infection, for not only did he ornament his villas with statues and paintings, but he even expended a million of sesterces (some 8,000*l*.) in the purchase of a table of “citrus,” the modern thuya.

Scagliola.

This is a mixture of gypsum and powdered selenite, made into a paste with glue, upon which paintings can be made. The process is as follows. Upon a tablet of white stucco, formed of this plaster of Paris paste, the outlines of the work designed are traced with a sharp instrument, and the cavities thus made are filled in with successive layers of the same composition, but coloured. The application of the different layers is continued until all the varieties and shades of colour are produced, after which the surface is polished. The invention of this process is usually ascribed to Guido del Conte, an ingenious mason of Cari, near Correggio, in Lombardy. Guido's scagliola was a complete imitation of marble; his pupil, Annibal Griffoni, imitated small pictures, engravings and oil-paintings; while Gravignani represented the rarest sorts of marble, covered with delicate tracery and interspersed with figures.

NOTES AND COMMENTS.

OUR archæological societies in their periodical excursions provide pleasure and knowledge for themselves and also for the general public when they secure the company of a competent member of the Press to record the proceedings. It is seldom that we can see recorded any description of the unknown district within five or seven miles of London. No casual visit will do justice to the antiquities so near London. Lately the energetic Society known as the Upper Norwood Athenæum has had the courage to invade the very interesting country in the north of Middlesex. In a recent excursion they visited Edgware, Little Stanmore and Great Stanmore, and within the last week visited the collegiate church of St. Saviour, Southwark, the restoration of which is now nearly complete, under the direction of Sir A. W. BLOMFIELD, A.R.A. No society can visit a district in the neighbourhood of London without being interested in what they see. But it has been so neglected that the descriptions do not touch the fringe of what we possess. In the visit to Stanmore, after the President's address it remained for Mr. POTTER to throw extra light on the history of the buildings visited. Even he failed to say what is feared by many about Whitchurch, an historical building for which the Duke of BUCKINGHAM had secured HANDEL as organist, that it may soon be valueless for want of repairs. The Society mention that the Chandos monuments were under repair, but the preservation of this historic building should interest all antiquarians.

It is hard on contractors to have it proclaimed to the world by the London County Council that they charge exorbitant prices. But still more unbearable is the statement that the amateurs of the Council can produce superior work. MESSRS. REED, BLIGHT & CO., Limited, who have carried out the contracts for the asylum at Claybury, the artisans' dwellings in Poplar and Limehouse, besides other works, have challenged the statement of the Council, and suggest that a committee of experts be at once appointed to verify it. They are willing to pay 50*l.* to an hospital if it should be discovered that any of their works are not equal in quality and materials to those executed by the London County Council. MESSRS. REED, BLIGHT & CO. must be innocent if they imagine that the aim of the majority of the Council is either to produce excellent work or to diffuse truth. What is sought after is deluding the greater number of the inhabitants of the metropolis into the belief that there are no such guardians of London as the Council, and we must not suppose such an end can be attained by careful language or enduring construction. Conviction is expected to be gained by force of contrast, and it is no wonder, therefore, the works committee are made to appear very white and the contractors very black in the representations prepared by the Council.

ONE of the disadvantages of building theatres on the sites of houses in streets was seen in an action which was brought against Mr. W. EDOUN, the lessee of the Strand Theatre, by the lessee of an adjoining house, which was tried before Mr. Justice WRIGHT on Tuesday. When the theatre was built, from motives of economy the frontage to the Strand was limited to as much ground as would afford an entrance-hall to the principal part of the house; the remaining parts were entered from a narrow street at the side, at the corner of which the plaintiff's house is built. There is also a house which belongs to the theatre, now let to Mr. SWANBOROUGH. The buildings may be said to be dovetailed into one another, but there was a very small area which was left open between them at one point. It was large enough to hold a gully, into which down pipes from the buildings drained. Twelve years since a flat roof was placed over the area by a former lessee of the theatre, but, as it caused a diminution of light to some of the plaintiff's windows, it was arranged that the open area up to a height of 7 feet should be considered as part of plaintiff's premises. The flat roof was formed, and although the pipes were supposed to have been unaltered, yet water accumulated on the roof and found its way into plaintiff's house. As often happens in such cases there was only restricted access to the roof, and the question to be decided was the responsibility for the damage. Mr. Justice WRIGHT

gave an elaborate judgment. While admitting the right of a man to have his premises uninvaded by anything injurious from his neighbour's land, he said the right was subject to qualifications. It might be shown (1) that the damage resulted from the act or default of some third party. (2) That the land was used in an ordinary and reasonable manner, and the damage happened without wilfulness or negligence. (3) If the plaintiff consented to the defendant collecting water on his (defendant's) land the defendant would not be liable for the consequence in the absence of negligence. In the present case his lordship said the defendant did no more than was ordinary and reasonable in conducting his own water from the roof to the gully, which was for the common benefit, and impliedly and, he should also infer, actually attended to by the plaintiff. The defendant was, therefore, not liable unless upon proof of negligence, and he saw no sufficient evidence of negligence. It might be alleged that defendant failed to examine the gutter. He was not prepared to say either as a matter of law or as a matter of fact, in the absence of express evidence, that a periodical inspection ought to have been made, or that if it had been made it would have prevented the damage. Judgment was therefore given for the defendant, with costs. The judgment, like some in light and air cases recently given, suggests that a more liberal interpretation of the law is taken in dealing with disputes between neighbours. Houses have to be so closely packed in towns, if the occupants will look upon themselves and each other as representatives of interests that are in opposition, and will find a cause of quarrel in a straw when honour is supposed to be at stake, there would be endless litigation. Surveyors, therefore, who advise arrangements which will keep cases out of court are not likely to be condemned by the judges.

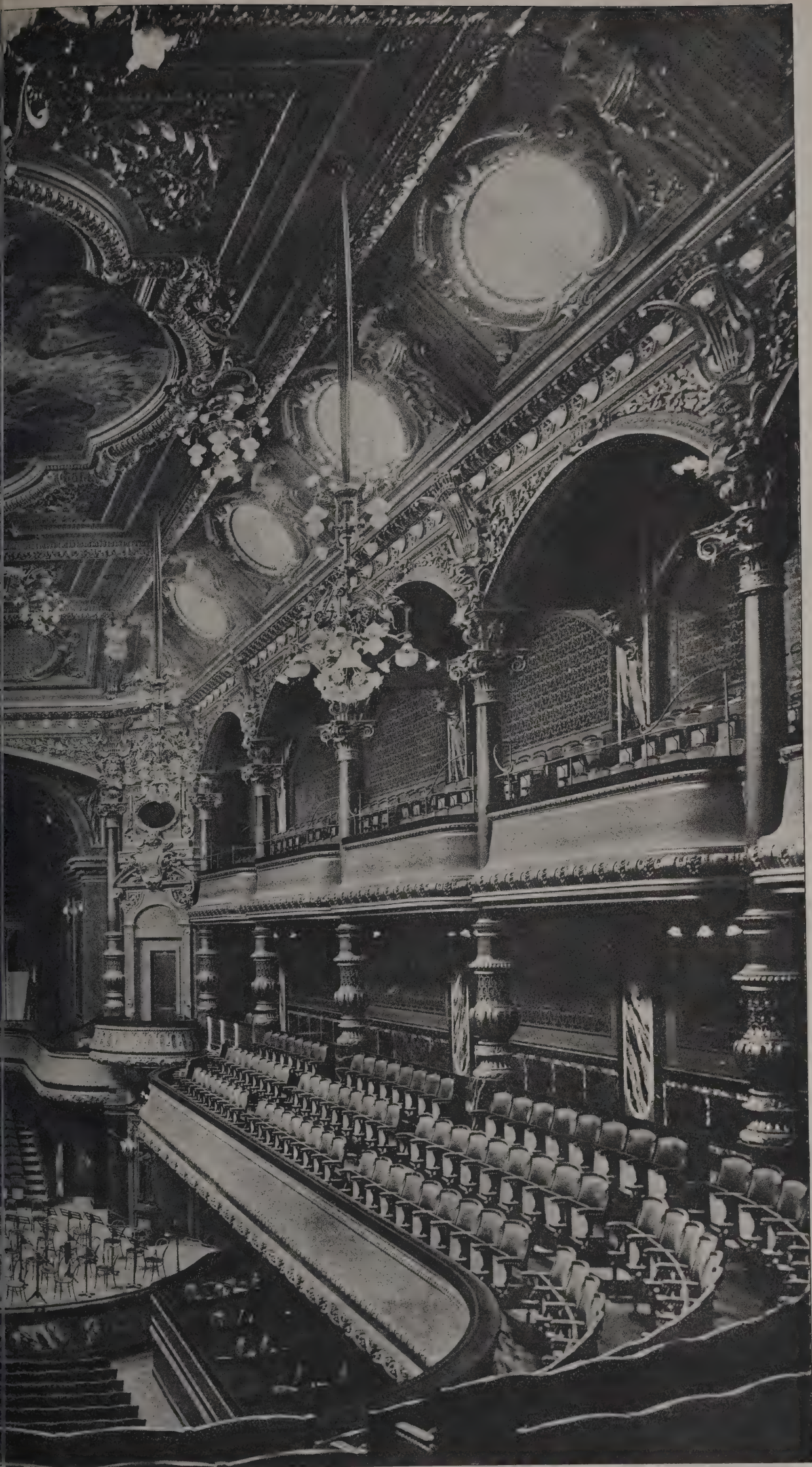
STUDENTS who are desirous to become acquainted with the principles of mechanics and hydrostatics will find them clearly explained in the "Text Book" by Mr. HERBERT HANCOCK, M.A. (SAMPSON LOW, MARSTON & CO.). It is not easy to adopt a treatment of subjects so familiar that is not stereotyped, but the author has succeeded in that way. His explanations are very clear, and the numerous diagrams remove any difficulties which may arise in the minds of novices. At the end of each are test questions and problems. Copies of examination papers are also given. It can be recommended as a guide to the latest methods of dealing with the subjects.

It would be interesting to know how many actions have been fought in the law courts in order to determine the number of cube feet in a ton of timber. The latest came before the Scottish courts in Edinburgh. A firm of timber merchants in Glasgow sued the Caledonian Railway Company for repayment of excessive charges. It was alleged that the company assumed that 50 cube feet of deals and battens were equivalent to a ton. It was allowed that a measurement ton of 50 cube feet for logs is correct enough for practical purposes, but deals and battens are much lighter, and consequently 70 cube feet to the ton would be a fair assumption. The company maintained that their weight clause was inapplicable to deals and battens, which were subject to special rates. After all the litigation the case was, however, withdrawn on Tuesday, and the lawyers are the only gainers.

THE number of Roman villas in England is now increased, for one has been unearthed at Darenth, in Kent, and there is a supposition that it is only a part of a group of villas. The remains are not entirely exposed, but enough is revealed to prove that the villa was rather large. The outer walls are of flint and about two feet thick. It is evident that two of the rooms were paved with brick tesserae of small size, while in others tiles were used. There was a large hall which is not entirely uncovered. The land on which the villa was found belongs to the Ecclesiastical Commissioners. The tenant has given facilities for the excavations, and in fact a sub-lease of the field has been obtained. The operations are conducted by Mr. GEORGE PAYNE.

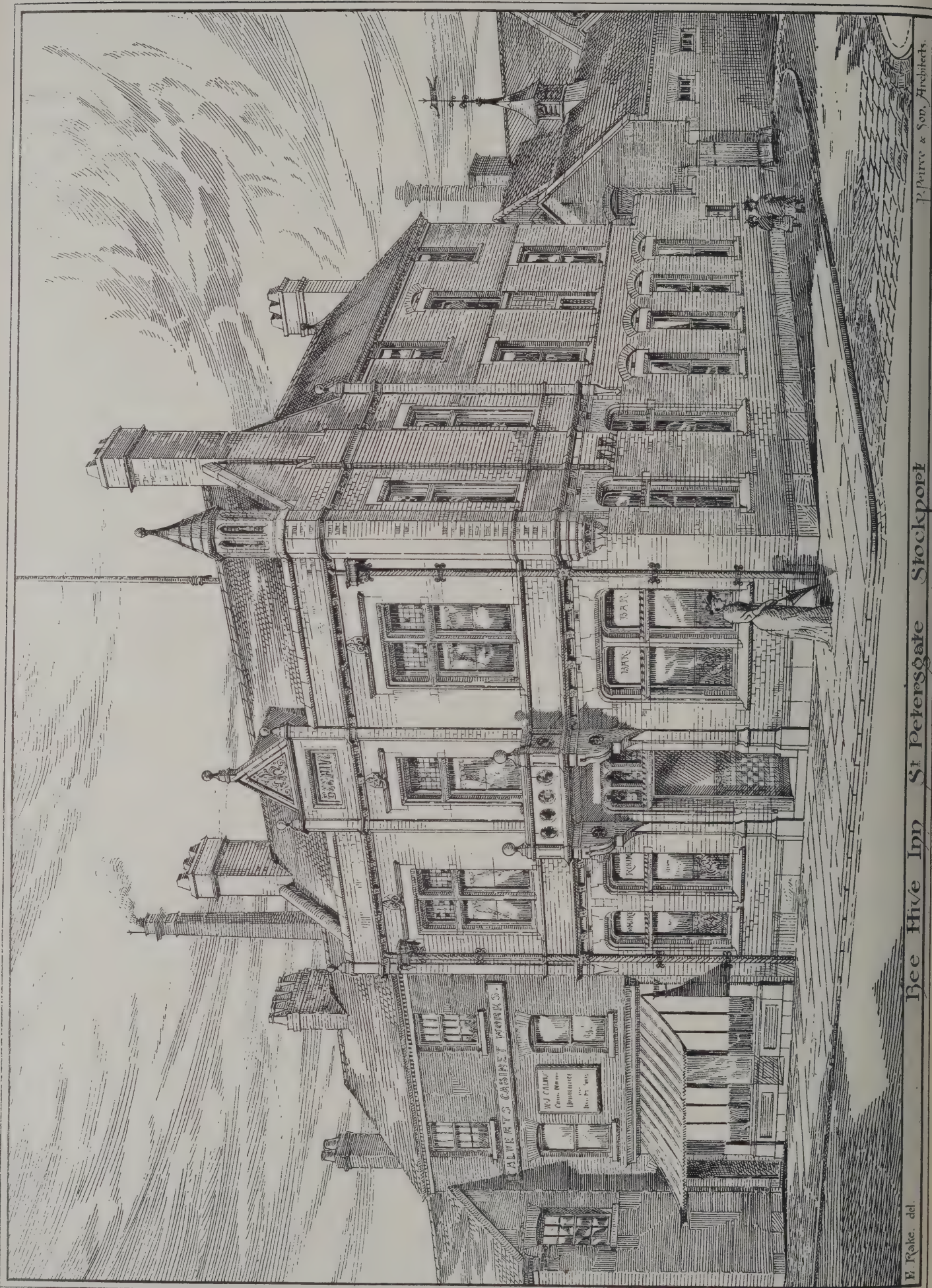


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THE FULHAM CONSERVATIVE CLUB.
HUGH T. PORTER, Architect.



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ILLUSTRATIONS.

VICTORIA HALL, GENEVA.

For article see page 356.

QUEEN'S HALL, LANGHAM PLACE, W.

THE FULHAM CONSERVATIVE CLUB.

THE rapid and unprecedented growth of the population of the borough of Fulham, and the consequent increase in the number of the electors, has necessitated the extension of the Fulham Conservative Club premises to accommodate the additional members and to provide improved offices for the Registration Association. The committee have been able to make arrangements by which the sum of 2,000*l.* has been applied towards the enlargement of the premises, the freeholder having renewed the lease of the present building for ninety-nine years, including the piece of vacant ground adjoining, 37 feet frontage and 70 feet deep, on which the new buildings are situated. In the new portion there will be a wide vestibule, with swing doors opening into a spacious hall, opposite to which will be the staircase leading up to the large hall, which will be 45 feet long, 28 feet wide and 16 feet high, with a retiring-room attached. On the ground floor the front will be occupied by offices for the Registration Association, having a separate entrance from the vestibule, and at the back there will be a billiard saloon for two tables, with lavatories, &c., adjacent. The old premises on the left of the entrance will be altered so as to increase the size of the smoking-room, bar and kitchen accommodation. The front is faced with Bracknell red bricks and Box ground dressings. The floors are pugged with slag wool to deaden the sound, and the billiard-room and main hall are specially ventilated.

The work is being carried out in a substantial manner by Messrs. TURTLE & APPLETON, of 171 St. John's Hill, S.W., under the superintendence of Mr. HUGH T. PORTER, of 76 Santos Road, West Hill, Wandsworth, S.W.

BEEHIVE INN, STOCKPORT.

THE Beehive Inn, St. Petersgate, Stockport, which has recently been rebuilt for Mr. DANIEL CLIFTON, brewer, of Stockport, is of local pressed and moulded bricks, with dressings of Darley Dale stone. Internally expense has not been spared, there being mosaic floors, richly-tiled walls, oak staircases, stained and embossed plate-glass windows and screens, walnut furniture, fittings, &c. Messrs. P. PEIRCE & SON, of Stockport, were the architects.

READING UNION WORKHOUSE.

THESE buildings have recently been very considerably enlarged and entirely remodelled. On the afternoon of the 28th ult., the architects, Messrs. Charles Smith & Son, met the Reading Literary and Scientific Society, with a large number of other visitors, and conducted them through the establishment.

In the course of a paper read by Mr. Charles Smith to the Society, he said that the new buildings as now enlarged and remodelled had been arranged for the accommodation of about 500 inmates, namely, 156 in the hospital and 344 in the general workhouse, in addition to which accommodation for forty-five vagrants had been prepared. In arranging the new scheme it had been necessary to enlarge, not only sufficiently for the additional number to be accommodated, but also to bring the buildings up to the modern requirements of the Local Government Board as to cubic space for the entire number.

The first difficulty that presented itself was that, in 1867, the buildings were erected close up to the eastern boundary of the property, the division between the sexes then being from north to south parallel with this boundary, so that there was no room for enlargement on the female side. Several attempts had been made to meet this difficulty by acquiring additional land on this side of the site, but without success, and ultimately, with the consent of the Local Government Board, the architects had adopted the bolder plan of dividing the sexes east and west instead of north and south, making the old hospital, which was formerly for both sexes, for the healthy women, and the general workhouse, which was for both sexes, to be in the new arrangement for men only. By this means the two main

blocks of buildings were retained. Everything else is to a great extent new, namely, the hospital, the central administrative block, the laundry, the porter's lodge and the receiving wards.

It was also necessary to find accommodation for the vagrants, as it had been determined to abolish the old vagrant wards in the centre of the town and provide new on this site.

The new buildings may be briefly described as follows:—

The Vagrant Wards.—The greater number of the vagrants are accommodated on the associated principle, but separate cells have been provided for special cases.

The Hospital.—The new hospital has been built on the pavilion system, the south pavilion being for men, the north pavilion for women, and the central pavilion is occupied on the ground floor as an administrative block, and on the upper floor as lying-in wards for women. The north and south blocks have four wards, with small special case wards, duty rooms and nurses' rooms, and each ward has a balcony for the convalescent patients for airing in fine warm weather.

As before referred to, two existing blocks of buildings have been utilised for men and women respectively in health.

The Central Administrative Block.—The central administrative block is entirely new, and embraces residence for master, a complete set of stores, new dining-hall, which is also used for Divine service on Sundays, also a kitchen, sculleries, bake-house and new laundry.

The Imbecile Block.—The imbecile block has been so altered that the accommodation which hitherto served for both sexes is in the future to be used for women only. The imbecile men are temporarily housed in another portion of the establishment, a further addition to this block of buildings being contemplated in the future.

Engineering.—The engineering department is very complete, the scheme adopted being to provide from one central source hot water for laundry and baths, and steam for heating, cooking, &c. This work has been very efficiently carried out by Messrs. Benham & Sons.

An entirely new set of water-mains has been laid, to which hydrants have been attached in case of fire. An entirely new system of drainage both for sewage and rain-water has also been laid down, with outfalls into the public sewers in road, and the sanitary arrangements generally have been remodelled in accordance with modern requirements. Hitherto the outfall for drainage had been to the low-lying garden and land west of the workhouse, but this proved to be too near the buildings for a system of irrigation.

The building works have necessarily been carried out in sections and the following have been the contractors, all of Reading:—Mr. G. S. Lewis, the new vagrant and entrance blocks; Messrs. Higgs & Sons, the new hospital, also the board-room and offices in Thorn Street; Messrs. Collier & Catley, the main central administrative block; Mr. Tucker, the imbecile extensions, &c., gas mains, &c. The drainage and sanitary works have been carried out by Messrs. Collier & Catley, of Reading.

In the course of his remarks on the history of the poor in England, Mr. Smith said few questions had presented greater difficulties than dealing with them. In England in the Middle Ages most of the labouring classes were serfs, and looked to the feudal lords to maintain them in return for work, and many of these serfs even when made free became so destitute that they were glad to return to serfdom. The chief difficulty in those times was with the itinerant poor, and severe and barbarous laws were passed against vagabondage and mendicancy, and up to the time of Richard II. pauperism was treated as a crime, and even in the time of Henry VIII. the habitual beggar was ordered to be whipped for the first offence, his ears cropped for the second, and eventually might even lose his life: this latter was however soon repealed and branding the body substituted.

The Church in those days was without doubt the great helper of the poor, especially the monasteries and religious houses. This was proved by the fact that after the dissolution of the monasteries pauperism very greatly increased. Several Acts were passed in Elizabeth's reign, and in 1592 an important Act came into force which authorised a rate called "Week's Pay" to be levied in each parish. Eventually, at the end of Elizabeth's reign, 1601, an important Act was passed which has in some sort formed the basis of the poor-law system in England; it taxed every inhabitant of every parish for the relief of the poor, and to a great extent rearranged the administration generally of the Poor Laws. Many Acts, however, were subsequently passed; for instance, in Charles II. the Laws of Settlement, *i.e.* the deciding to which parish the pauper belonged. This has been always a difficult question, and one leading to litigation.

In 1702 (George I.) the system of farming the poor commenced, by which parish officers could, with the consent of the parishioners, purchase or hire houses, or might contract with persons for lodging, keeping, maintaining and employing the poor, and under this small parishes could unite by voluntary

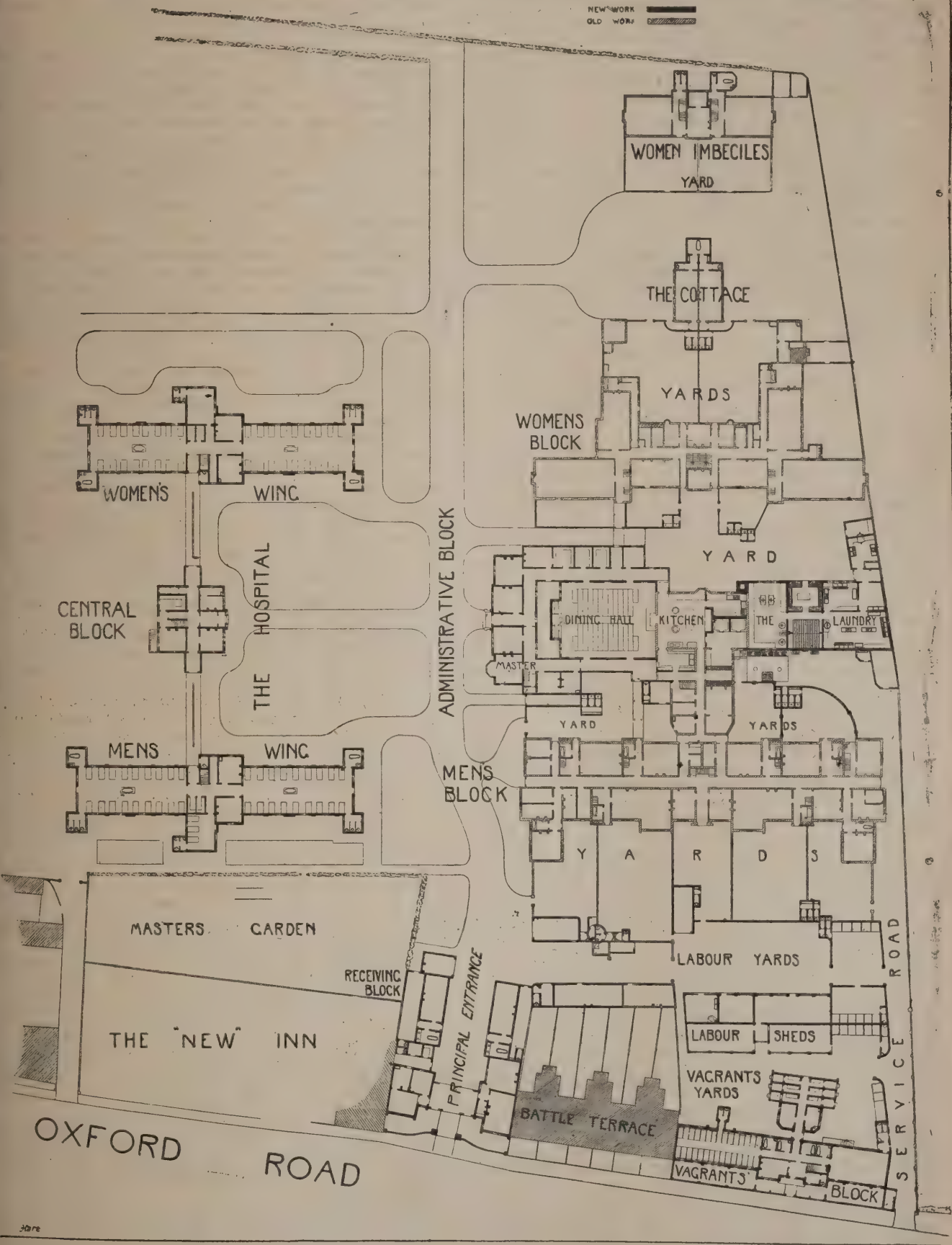
READING UNION WORKHOUSE
 NEW HOSPITAL CENTRAL ADMINISTRATIVE
 BLOCK VAGRANT BLOCK NEW ENTRANCE and
 ADDITIONAL BUILDINGS recently erected in the
 remodelling the general arrangements of the
 ESTABLISHMENT November 1894
By Mr. Smith for Mr. Harris
Reading



Chas. Howard Smith del.

READING UNION WORKHOUSE

*Chas. Smith & Son
Architects Reading
Nov 6th 1894*
Scale of Feet



agreement. This was the commencement of our present system of unions. This system (farming) was, however, open to great abuses, the keepers of these houses making large profits out of the parish, thus getting their labour done at the parish expense. Eventually, in 1783 (George III.), an Act was passed, called Gilbert's Act, when guardians of the poor were appointed, and in 1795 a further Act, a permissive one, was passed for outdoor relief.

Then came the important modern Act of 1834, under which the Poor Laws of the country are administered, called the Poor Law Amendment Act. Under this three commissioners were appointed with a number of assistant commissioners. England was divided into districts, unions formed, and, without doubt, an enormous improvement effected both for the benefit of the poor and at reduced cost to the ratepayers.

During the twelve years previous to 1834, the country expended in carrying out the Poor Laws 76,096,000*l.*, whereas in the twelve years after 1834, even with the increase of population, only 57,247,000*l.*

As showing the importance of this Poor Law question to the community might be mentioned the fact that there were in England and Wales in 1885 800,000 paupers, about one-thirty-fourth part of the whole population, and these were costing the country about 8,000,000*l.* a year.

In 1848 an Act was passed constituting the Poor Law Board the central authority instead of the commissioners, and this became a Government department, with a president, who was a Minister of the Crown, at its head.

Then, in 1871, the Poor Law Board was abolished, and the powers and duties transferred to the Local Government Board, who took charge not only of the control of the administration of the poor law, but more or less over all the local government of the country.

THE LONDON BUILDING ACT OF 1894.*

(Concluded from last week.)

THE height of buildings in old streets, *i.e.* streets laid out before Aug. 7, 1862, is now restricted to 80 feet and two additional storeys in the roof, but towers, turrets, or other architectural features or decorations are excluded from the restriction, as also are churches and chapels. This, however, does not prevent you from completing a building taller than 80 feet if begun before the passing of the Act, or of rebuilding a building which now exceeds those dimensions, or of continuing a row or block of existing buildings belonging to the same owner exceeding 80 feet high to an equal height.

The Council have power to consent to buildings being erected exceeding this limit of 80 feet, but they must within one week after giving consent publish the fact for the benefit of adjoining owners being within 100 yards of the site. These adjoining owners, if they object, may appeal to the tribunal within twenty-one days, and should the Council refuse to consent to any building exceeding 80 feet high the applicant can also appeal to the tribunal.

In a street formed after Aug. 7, 1862, and of a less width than 50 feet, no existing building is to be raised, and no new building is to be erected so that the height of such building shall exceed the distance of the front or nearest external wall of such building to the opposite side of such street, unless with the consent of the Council. A church or chapel is excepted from this section.

Where a corner building abuts upon streets of different widths the height is regulated by the wider street, and this height may return along the narrower street for 40 feet.

The height of habitable rooms is increased from 7 to 8 feet 6 inches except for rooms wholly or partly in the roof, and these may be 8 feet throughout not less than one-half the area of such rooms. This will prevent the formation of three storeys within the limit of height of a 9-inch wall.

Living rooms over a stable have now to be separated from the stable by a concrete pugged floor or floor of other solid construction 3 inches in thickness, and the soffit of the stable is to be ceiled with lath and plaster. The access to the living rooms is to be separated from the stable by a 9-inch brick wall.

We now turn to the additional clauses relating to safety from fire in private buildings and from fire and panic in public buildings.

Every dwelling-house or factory having a parapet is to be provided with a dormer window or door opening on to the roof, or with a trap door furnished with a fixed or hinged step ladder leading to the roof, or with other proper means of access to the roof.

Any storey in the roof of any domestic building the floor of which is 60 feet above the street level shall be constructed of fire-resisting materials throughout, and every new building exceeding 60 feet in height, the upper storeys being 60 feet above the

street level, is to be provided with such means of escape in case of fire as can be reasonably required under the circumstances of the case, and no such storeys are to be occupied until the Council shall have issued a certificate that the provisions of this section have been complied with.

In the clauses dealing with chimneys and flues, section 64, clause 4, a flue is not to be adapted to or used for any new oven, furnace, cockle, steam boiler or close fire used for any purpose of trade or business or to or for the range or cooking apparatus of any hotel, tavern, or eating-house unless the flue be surrounded with brickwork at least 8½ inches thick from the floor on which such oven, furnace, cockle, steam boiler, or close fire is situate to the level of the ceiling of the room next above the same, and a flue is not to be used in connection with a steam boiler or hot-air engine unless the flue is at least 20 feet in height measured from the level of the floor on which such engine is placed. The floor under every oven, copper, steam boiler, or stove which is not heated by gas and the floor around the same is to be for a space of 18 inches formed of materials of an incombustible and non-conducting nature not less than 6 inches thick. The floor over any room or enclosed space in which a furnace is fixed and any floor within 18 inches from the crown of an oven is to be constructed of fire-resisting materials.

A most important provision as affecting the safety of shop assistants and the pockets of the shopkeeper is contained in section 74.

In every building exceeding 1,000 square feet in area, used in part for purposes of trade or manufacture and in part as a dwelling-house, the part used for the purposes of trade or manufacture is to be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of fire-resisting materials.

The part used for purposes of trade or manufacture shall (if extending to more than 250,000 cubic feet) be subject to the provisions of this Act relating to the cubical extent of buildings of the warehouse class.

It is, however, provided that there may be constructed in the walls of such staircases and passages such doorways as are necessary for communicating with the different parts of the building, and there may be formed in any walls of such building openings fitted with fire-resisting doors. It does not seem at all clear, however, if the openings from the business part into the domestic part are to be fitted with fire-resisting doors. To make the section of any use it should have been distinctly stated that the openings should be closed with iron doors, for if we refer to the schedule defining fire-resisting materials, we find that an oak or teak door two inches thick is considered fire-resisting.

Another important clause is:—In every building exceeding 2,500 square feet in area containing separate sets of chambers or offices or rooms tenanted by different persons, the floors and principal staircases shall be of fire resisting materials.

The limit of cubical space for buildings of the warehouse class has been increased from 216,000 cubic feet to 250,000 cubic feet, but there are certain exceptions to buildings situate at a greater distance than two miles from St. Paul's and used for certain specific purposes, constructed of brick, stone, or iron and of one floor only.

The Council, however, have power to consent to buildings up to 450,000 cubic feet, provided they do not exceed 60 feet high and are not used for the purpose of any trade or manufacture involving the use of any explosive or inflammable materials.

The rules as to openings to be provided in party walls separating large buildings are somewhat altered; the size is 7 feet by 8 feet as at present, but the number is limited to one-half the length of the wall. If, however, the distance between the iron doors in each side of the wall is not less than 24 inches the opening may be 9 feet 6 inches in height.

Respecting the safety from fire and panic in public buildings several provisions have been added which it is most important for the architect to note.

Every staircase for the use of the public shall be supported and enclosed by brick walls not less than 9 inches thick, and the treads of each flight of stairs shall be of uniform width.

No staircase, internal corridor, or passage-way for the use of the public shall be less than 4 feet 6 inches wide, except where the accommodation is for only 200 persons, and then the passage-way may be 3 feet 6 inches wide.

The width of the staircases, internal corridors, or passages is to be increased by 6 inches for every additional 100 persons above 400 until a maximum width of 9 feet is obtained, and a handrail is to be provided up the centre where the width is 6 feet and upwards.

You may, however, if you prefer it, substitute two staircase corridors or passages for one; then in that case they need be but two-thirds of the width of a single staircase, but in no case less than 3 feet 6 inches. You also want a separate set of staircases, corridors and passages to each gallery where you have more than one.

* A paper by Mr. Ellis Marsland, read before the Society of Architects.

All doors and barriers shall be made to open outwards and no outside locks or bolts are to be fixed thereto.

All staircases, corridors, passages and landings are to be constructed of and carried by supports of a fire-resisting material.

All public buildings have to be constructed in such a manner as may be approved by the district surveyor, or in the event of disagreement may be determined by the tribunal of appeal, and no public building is to be used as such until the district surveyor or tribunal of appeal shall have declared his or their approval of the construction thereof.

This I think exhausts all the new clauses under my second head. We now turn to the additional structural requirements.

The most important of these is the additional thickness required for walls. I have prepared a diagram showing in black the thickness of walls under the old Act, with the additional thickness shown in red required by the new. It will be observed that the height of walls of dwelling-houses jumps from 25 feet to 40 feet, and although you may have two storeys of 8½ inch work to a building 25 feet high, if it exceeds this height and you go to three storeys the lower two have to be 13 inches thick even if a part of the third storey is in the roof.

The thickness of walls is increased in most cases, and I think only in one case in warehouse walls are they reduced in thickness.

The new Act does not countenance hollow walls, for if they are constructed there is to be a wall on one side of the hollow space of the full thickness described by the Act.

The footings of walls are somewhat altered; they are to project on each side to half the thickness of the wall as at present, but their height is to be two-thirds the thickness, and where an external wall is built against another external or party-wall the footings on the one side may be omitted.

The underpinning of walls is to be done in cement, and where a wall is thickened this also is to be done in cement. The top six courses of all chimney-stacks are also to be built in cement.

There is an additional rule with regard to cross-walls. Wherever a cross-wall becomes in any part an external wall, such cross-wall shall be of the thickness required for an external wall of the same length and height.

Sections 65 and 73 will be welcomed by architects, as they will save them a considerable amount of time and delay in preparing their plans. Under the present Act, if we desire to erect a furnace chimney shaft, or project a bay window or oriel beyond the general line of frontage, an application was necessary to the Council; but under the new Act a furnace chimney shaft may be erected without this preliminary, provided that it tapers at the rate of 2½ inches in 10 feet, that the top 20 feet is 3½ inches thick, and that every additional 20 feet measured downwards increases in thickness half a brick; that the footings project to a distance equal to the thickness of the enclosing wall at its base and the space enclosed by the footings filled in solid; that the width of the base be at least 1-10th of the height if the shaft is square, and 1-12th if round or any other shape; that if there is a fire-brick lining it must be independent of the thickness of the shaft, and not bonded therewith; and lastly, that the concrete foundation and the cap be to the satisfaction of the district surveyor.

A bay window may now be projected beyond the general line of fronts in a street 40 feet wide, and on to the forecourt, if it does not exceed three storeys in height above the footway, and does not project more than 3 feet or exceed in width 3-5ths of the frontage. It also must not come within 20 feet of the centre of the roadway, or nearer to the party wall than its projection, and must not be used for trade purposes.

Oriel windows must not be less than 10 feet above the footway of the street, or project more than 3 feet from the building or 12 inches over the public way; their width must not exceed three-fifths of the frontage, and they must not come within 4 feet of the centre of the nearest party wall. The whole must be constructed to the satisfaction of the district surveyor, and if you disagree with him you may go to the superintending architect, whose determination shall be final.

It should also be noted that the eaves, barge-boards and cornices to dwelling-houses need not now be of fireproof material; nor is it necessary that the wooden cornices and barge boards to dormers, not exceeding 12 inches deep, be covered with incombustible material. You have still, however, to get the consent of the Council to any porch, portico, verandah, balustrade, outside landing, or staircase, if you desire to construct them of wood.

Frames of doors and windows may now come out to the face of an external wall—which will be good news to those who practise in the Queen Anne style. Shop-fronts, under Section 73, are not now confined to the ground storey, but may extend to the first floor, provided the total height does not exceed 25 feet. This will create quite a revolution in the appearance of our streets, although Section 55 seems to confine the frames of doors and windows of shops to the ground storey.

Bressummers, whether bearing upon a party or external wall,

must have an additional bearing of 4 inches upon a sufficient pier of brick or stone, or upon a timber or iron storey post, and the district surveyor is to have power in his discretion to require that every bressummer shall have such other storey posts, iron columns, stanchions, or piers of brick or stone or corbels, as may be sufficient to carry the superstructure.

There is to be a space left between the ends of iron girders to allow for expansion, such space to be equal to a quarter of an inch for every 10 feet of the length. Hearths may now be 6 inches thick instead of 7.

Just a word or two on Part VII., which deals with special and temporary buildings and wooden structures. These cannot be erected without the Council's consent, who may impose certain conditions as to their erection and limit the time which they may remain; but an open shed, whatever the definition of this may mean, can be erected, not exceeding 16 feet high and 400 feet in area of any substances and in any manner approved by the district surveyor. This seems to me a most extraordinary clause.

Part VIII., dealing with the rights of building and adjoining owners, contains in Section 87 some very useful provisions which will facilitate the operations of the architect in dealing with walls abutting on neighbouring lands.

Where lands of different owners adjoin and are unbuilt on at the line of junction, the following provisions shall have effect:—

If you desire to build a party wall on the line of junction, you may serve a notice thereof on your neighbour.

If he consent to the building of a party wall, the wall may be built half on the land of each of you, or in such other position as may be agreed.

The expense of building the wall is to be defrayed by you and your neighbour in due proportion, regard being had to the use made and which may be made of the wall by both of you.

If your neighbour does not consent to the building of a party wall, you may not build it otherwise than as an external wall placed wholly on your own land.

If, on the other hand, you do not want to build a party wall, but only an external wall up to the boundary of your land, you give notice to your neighbour, and one month after you may proceed with your wall and project your concrete and footings on to his land, making compensation to him for any damage you may occasion him, and if you cannot agree on the amount, this is to be determined in the manner provided in this section.

The only other points to which I wish to draw your attention in this part of the Act is that it provides that a building owner may underpin a party wall, a point uncertain in the old Act. Also he has a right to raise a party fence wall, or to pull the same down and rebuild it as a party wall.

The minimum limit of time in which a building owner may proceed to exercise his rights is reduced to one month in the case of a party fence wall and two months in the case of a party structure or party wall.

The building owner has now at his own expense, where he lays open any part of the adjoining land or building, to make and maintain for a proper time a proper hoarding and shoring or temporary construction for the protection and security of the adjoining owner.

If a building owner serve a party wall or structure notice on an adjoining owner, it is not available unless the work to which it relates is begun within six months after the service thereof and prosecuted with due diligence.

A fresh provision is contained in Section 93. It is incumbent on the building owner to serve a notice on the adjoining owner if he (the building owner) proposes to build within 10 feet of the adjoining owner's wall if such building will extend to a lower level than the foundations of the building adjoining, and if the adjoining owner so requires he is to underpin the wall, or if the building owner thinks it necessary he may underpin it, but he is to be liable to compensate the adjoining owner for any inconvenience, loss, or damage which may result by reason of the work.

If the building and adjoining owner disagree as to the necessity for underpinning, the matter is to be settled in the same manner as other differences under this part of the Act.

If after a building owner has rebuilt a wall and the adjoining owner subsequently wants to use any more of it than he previously enjoyed, he must pay for it.

In Part IX., relating to dangerous and neglected structures, a new provision affecting architects occurs.

After the district surveyor has certified a structure to be in a dangerous condition and the owner dispute the certificate, he may within seven days from the service of the notice inform the Council in writing that he requires the matter referred to arbitration; he may then engage his own surveyor to report on the condition of the structure in conjunction with the district surveyor, and if these two cannot agree they are to appoint an arbitrator or the court may appoint one for them, and such arbitrator is to make his award within fourteen days. If it is against the district surveyor, the Council pay the costs; if in

his support the owner has to pay the costs. In the meantime I suppose the dangerous structure may take care of itself or promptly fall down.

In Part XIV. the Council take power to make by-laws on the following additional matters:—The dimensions of wooden bressummers; the dimensions of joists of floors; the protection of ironwork used in the construction of buildings from the action of fire; woodwork in external walls; the regulation of lamp signs or other structures overhanging the public way not being within the City; the means of escape from fire in buildings exceeding 60 feet in height.

Before closing I must make reference to the tribunal of appeal. The number of its members consists of three, one to be appointed by the Secretary of State, one to be appointed by the R.I.B.A., and one to be appointed by the Surveyors' Institution, but no member or officer of the Council is to be on it (but ladies are not excluded), and they are to be appointed for a term of five years and to be paid. They also may appoint their own clerks, officers and servants, who shall be paid such salaries as may be determined by the Council.

Offices are to be provided, as well as such professional advice and assistance as they may find necessary.

These gentlemen will have a busy time, as the following will be some of their duties:—

To hear appeals as to—

What is considered the "level of the ground" on a building site.

Setting back and bringing forward buildings.

Accuracy of plans of old buildings.

Laying-out or widening of streets.

Superintending architects' decisions on lines of frontage, and which is the front and which is the rear of buildings.

Open spaces required in rear.

Height of buildings.

Construction of public buildings.

A point of archaeological interest to architects is contained in Section 191. In the event of the destruction or its being necessary to take down any portion of an old building of architectural or historical interest not in accordance with the rules, it may be restored by permission of the Council as originally constructed.

One word more as to the exemptions beyond those at present allowed, and they include:—

Buildings not exceeding in area 30 square feet and not exceeding 5 feet high, containing no heating arrangements and not beyond the frontage line.

Party fence walls under 7 feet high.

Greenhouses if not attached to other buildings.

Cases of metal and glass in window openings for plants not projecting over the public way or more than 12 inches from the external wall.

My task is now done. I have intentionally forbore any attempt at criticism, as the time for this ceased when the bill became an Act, and have contented myself with explaining its provisions.

It is for us now to loyally interpret it and carry it out to the best of our ability, and when we have become accustomed to its working the time may come when we may venture to point out any defects it may contain.

THE SANITATION OF HOSPITALS AND INFIRMARIES.*

(Concluded from last week.)

OUR next point is that insanitary conditions may be produced by inadequate or ill-conceived arrangements for the removal of refuse. It can scarcely be necessary, nor indeed would there be time for me to enter in any detail into the principles of drainage. The methods of sound drainage are the same in a hospital as in any other building; and the neglect of them leads in both cases to similar disaster.

In all sanitary fittings, including water-closets, sinks, lavatories and baths, simplicity of form and cleanly appearance are desirable. They should also be, as far as possible, self-cleansing, and all casings of every kind should be dispensed with. In operation theatres, where, above all things, minute and excessive cleanliness is of the last importance, it is well to make all shelves of glass, not only that the state of the underside as well as of the upper can be readily seen, but also because glass is perhaps the only material not liable to injury from the acids used in the theatre.

I have referred to kinds of refuse not liquid. I mean by that not only the household refuse, dust, ashes, kitchen-stuff and so forth, but ward refuse, such as bandages, dressings, poultices and the like. In a general hospital the ordinary

household refuse may be consigned to the care of the parish dustman; but it should be collected and stored in iron bins, for which a suitable shelter not near any ward should be provided, and it should be removed daily. Kitchen-stuff in a general hospital may also be separately stored and disposed of. But in a general hospital all the ward refuse, and in a fever hospital all refuse of every kind, should be burnt in a properly-constructed furnace. This furnace must be so constructed that the gases resulting from combustion are destroyed or decomposed before reaching the smoke-flue. Such an apparatus has been devised by Mr. Brophy, of the firm of Slater & Co., and is in use at the Middlesex and the London Fever Hospitals.

With regard to drainage generally, I will only add a word to impress upon you the extreme value of flushing. You can hardly have too much flushing power in hospital drains—or, for the matter of that, in any drains. If there is a laundry, the waste water can very well be taken to a flushing-tank, and utilised for flushing the drains by means of one of Mr. Roger Field's syphons. Of course, care must be taken to intercept the large quantity of shreds that invariably get detached from the clothes in the process of washing.

I now come to my last point, which was faulty arrangement of buildings. I have already indicated, when comparing the old and the new Lincoln Hospitals, the main features of mal-construction. What is called by Dr. Erichsen the "big-house system" is the sort of plan upon which so many of the larger provincial hospitals and some of the London hospitals were built, notably University College Hospital, where Dr. Erichsen's well-known lectures on Hospitalism were delivered. In extreme contrast to this we have such a building as the Eppendorf Hospital at Hamburg, where every ward is an absolutely isolated building, and not even a covered way exists on the site. The enormous cost, both for land, buildings and administration, of such a system could only be justified on grounds of absolute necessity. For myself, I fail to see the necessity; nor do I know of any sufficient reason for limiting the wards to one storey in height, as is done at many other recent foreign hospitals besides the Hamburg one. Provided you so construct your wards that each ward is cut off from direct air communication with the other wards and with the other parts of the hospital, provided that there is ample open space for all purposes of light and ventilation, it seems to me to be quite immaterial whether they are two or three storeys high. As an example of how wards should be isolated one from the other, I have here a plan of part of the new hospital now in course of erection at Derby. The wards are cut off from the corridor and from the staircase by short lobbies, which are, in fact, but covered bridges, with only just sufficient height for head-room, and with free air-space between the roof of one and the floor of that above. The corridor must of course be kept warmed at or about the same temperature as the wards; if this is done and ample inlets for air are provided in the latter, there will be no suction of air from corridor to ward. The ward itself must be as simple in construction and as cleanable in all its parts as it is possible to make it, and should contain nothing but the most necessary furniture. Suitable store-rooms must therefore be provided outside the ward for food, for linen and for patients' clothes, and an orderly closet for brooms, pails and other things necessary for daily use in the ward cleaning. Mouldings must find no place in a ward or in any of its offices; angles, whether vertical or horizontal, must wherever possible be hollowed—in vertical angles to promote circulation of air and avoid stagnant corners and in horizontal angles for facility of cleaning.

In the construction of ward floors I think solid or so-called fireproof construction is essential, and after much consideration and comparison of different kinds of floor surfaces I am inclined to think that carefully laid terrazzo is the best thing to be had. Hard-wood floors laid in block fashion are apt to tilt up with the weight of a bed plus a heavy patient, and the joints, however well made, will open in places. Terrazzo when well laid and when care is taken to have a sufficient thickness of concrete over the iron joists, gives a solid, homogeneous surface that is hard to beat. I know I shall be told that it is cold to the feet, but any slight inconvenience that may be felt from this cause can very easily be remedied.

A point of importance in regard to windows is that a window should always be put between the end bed and the end wall. This window may be as narrow as you like, but it must not be omitted. The necessity for this arises from the fact that these corner beds have been found to be less favourable to the well-being of patients than the other beds, owing, no doubt, to defective circulation of air round about the patient. The water-closets and sink-rooms must of course properly be cut off by cross-ventilated lobbies from the wards; this point is pretty generally recognised to-day. But what appears to be too often lost sight of is that, if it is necessary to take this precaution with regard to one closet, or set of closets, it is equally necessary to do it with every other. In a late competition for a large hospital I remarked several instances of the

* A paper by Mr. Keith D. Young, read at the meeting of the Architectural Association.

eglect of this obvious principle. In one case a two-bed ward ad its closet opening practically into the ward, and in another otherwise excellent plan the water-closets for the use of the nurses opened directly out of the ward corridor.

I fear I cannot give you any counsel of perfection for the finishing of wall surfaces in wards. The perfect wall-surface as yet to be invented; meantime, I doubt not if we can do better than a good Keene's cement surface painted and varnished.

If it is necessary to isolate wards from one another, it is of vastly more importance to separate the out-patient department, the operation-room, the laundry and the mortuary.

The out-patient department must be a separate building, and the only reason for any covered communication existing between it and the wards is, that the dispensary must be in touch with both. Or, to put it in another way, the dispensary must be part of the out-patient department, and to avoid having a second dispensary in the hospital proper, it must be also accessible to the nurses.

Equally necessary is it that the operation-room should be carefully isolated from all possible chance of air-borne contamination from any other part of the hospital. So far has this principle been carried abroad, that in one hospital in France the operation-room is a detached building in the garden and patients are conveyed to it through the open air in a specially-constructed litter. This is carrying asepticism to an extreme that we should probably find would not be upheld by any surgeon in this country. But I think it will be agreed that where possible the operation-room should be a one-storey building and cut off by a lobby from direct communication with the main corridor.

Inside the operation-theatre, everything that makes for perfect cleanliness and consequent asepticism must remain supreme. A floor of the best terrazzo, walls either of marble or enamelled tiles and well-painted and varnished cement ceiling, metal window-frames flush with the walls and hard wood doors, every part must be so made that the whole room can be if necessary swilled down with a hose. The fittings need careful consideration. For shelves the best material is glass, for reasons previously stated. Neither pipes or anything else must be fixed up against the walls so that they cannot be cleaned all round.

The laundry, again, must be an isolated building; it may be connected with the administration block by a covered way open at the sides, but even this I do not regard as an absolute necessity.

The mortuary building should be as far away from the rest of the hospital as possible. An essential part of the mortuary building is the post-mortem room, and here the aseptic precautions which in the operation-room are necessary for the sake of the patient are, to a lesser extent, perhaps, necessary for the sake of the medical officer. A post-mortem room should be as cleanable in all its parts as an operation-room, and the materials used in its construction, while less costly, should be of a hard, non-absorbent nature. For the walls glazed bricks, and for the floors cement or asphalt are most suitable, while the table itself should be of a hard marble, polished, and supported on a framework of iron. The floor should be drained by an open channel provided with an efficient flushing-tank, and covered with a movable iron grating.

In conclusion, let me try to summarise the essentials of hospital hygiene so far as the building is concerned. Perfect cleanliness in every part is the keynote, the beginning and the end of hospital construction, and to this every part must lend its aid. There must be no lurking-places for dust, no hidden recesses where foul things may be stored out of sight, no avoidable projections or ledges or mouldings to catch the dust, no cased-in pipes or shafts for foul linen, or lifts.

The patients must be safeguarded from infection from each other, from the out-patient department, the laundry and the mortuary, from the evil effects of ground air, foul drains or dust-bins. And in a word, every part of the establishment must be contrived with a view to facilitate that "exquisite perfection of cleanliness" which is the true secret of a healthy hospital.

Mr. ALEXANDER GRAHAM proposed a vote of thanks to Mr. Young for his paper. Referring to the subject of hospitals, he quoted a statement of Sir J. Cringle that he could effect a cure better in the old buildings than in the modernised hospitals of those days. The experience of the campaign in the Crimea had resulted in recommendations to regulate hospital construction by Sir Douglas Galton, Miss Nightingale and other authorities. Mr. Young had not made a distinction between town hospitals and country hospitals. In towns we were usually hampered for want of adequate space. In ventilating a hospital the difficulty was to give ventilation without causing draughts. A change of air could be easily provided thrice in an hour by ordinary means, though it would be difficult to lay down rule of thumb rules. It was better to work from the unit of floor space rather than that of cubic space. By cubic space you would have only 2 feet 6 inches between the beds, and he contended that floor space was more valuable than vertical space.

M. DE CHAUMONT said a height of 12 feet in the wards was sufficient. He (the speaker) considered a height of 14 feet was amply sufficient. He was pleased to hear Mr. Young condemn mechanical methods of ventilation, and pleased to hear him suggest that we should trust to natural ventilation by windows and open fireplaces. Mechanical methods so far he had never found desirable, and in addition they were expensive. For flooring, terrazzo might look more cold than it really was, but he preferred for flooring teak wood after undergoing the paraffin process. The suggestion to form shelves of glass was decidedly good. He had heard glass recommended for forming the walls of operating-rooms, but he had never seen the recommendation carried into practice.

Mr. GORDON SMITH seconded the vote of thanks. He endorsed the remarks of Mr. Young on ventilation of hospitals, and said he would rather depend on natural means in the shape of windows and fireplaces. In every hospital there should be an officer who should be responsible for the hygiene of the building, and architects would do well to have printed instructions on the use of the apparatus supplied under their direction. Floor space and distance between beds were factors that came before calculations of cubic space. A height of 13 feet for wards he thought was not objectionable when possible; in absence of patients wards should lay fallow, as was a custom abroad, and left to the open air.

Dr. PASTEUR said cleanliness in its absolutely chemical sense was necessary. If constructional materials were perfectly non-absorbent there would be no necessity to have wards lay fallow. He alluded to erysipelas, which prevailed in a hospital and ceased as soon as the cause of it was traced to a dustbin under a window letting in effluvia. Diphtheria ensued frequently from faulty drainage arrangements. He was inclined to condemn terrazzo flooring from hardness and not from its coldness. Accidents were more likely to occur with delirious patients, and he would recommend parquet flooring. In hospital construction the most important thing was attention to details. Artists who took the trouble to pay great attention to details had been most successful.

Mr. HENMAN alluded to the importance of giving the right aspect to wards. He did not favour the adoption of terrazzo floors. In change from cold to milder weather they dewed. It was a mistake to use glazed surfaces in wards, though they might be useful in w.c.s and operating rooms. Though they looked clean they were usually in fact damp and dirty, condensing just those products and exhalations that wanted to be got rid of. A hospital where the windows could not be opened, but ventilated it was supposed mechanically, was stuffy to a degree.

Mr. FARDEN, medical officer of the Middlesex Hospital, condemned terrazzo flooring. It fractured, possibly by contraction and expansion of the iron girders. He preferred solid teak floors.

A vote of thanks was passed to Mr. Young by acclamation and the proceedings terminated.

FIRE RISKS IN SYDNEY.

A SPECIAL meeting of the Institute of Architects of New South Wales, to which all architects and builders practising in Sydney were invited, was held some weeks ago, when a discussion took place on the question, "Is Sydney liable to be destroyed by fire?"

Mr. Thomas Rowe, who opened the discussion, said that Sydney had in the early days been laid out in a very crude manner, the main streets having formerly been bullock tracks. They had therefore exceptional difficulties to contend with, and they should profit by this experience in laying out country towns. The cities of Adelaide and Melbourne, as well as many of the more modern towns, were better provided against destruction by fire than Sydney was. They were all agreed as to the necessity of an amended Building Act to prevent the erection of defective buildings, such as they saw everywhere around them. All kinds of buildings were being put up in a defective manner, subject to fire. With regard to fire rates, he must say that they were unnecessarily high. He never could understand why the fire insurance offices of this city should increase their rates immediately after a large fire took place. He had always thought that the capital of a fire insurance company was so arranged as to provide for all risks, but it seemed that it was not so, for when a great fire took place in the city the rates were increased to cover the losses. There was something wrong somewhere. The forty-three insurance offices of the city at present covered risks to the extent of 61,185,715 $\frac{1}{2}$ l., an increase of 2,000,000 $\frac{1}{2}$ l. over the previous returns. Looking at the question from all points of view he could not say that Sydney was any different from other cities of the world regarding the liability to fire, and certainly in a no worse condition than London. He had travelled through cities on the Continent infinitely less provided against fire; and in Paris, for

instance, no provision was made in the building laws for the thickness of walls. In Vienna and other cities, however, the law was very strict in this respect. The President of the Institute had said that 90 per cent. of the bricks used here were unfit for building purposes, but his experience of forty years led him to the very opposite conclusion. With regard to the water supply, he might say that although the provision at present was excellent there was a danger in the case of a large fire continuing for more than ten hours of the high-level water supply becoming exhausted, and he certainly thought that a large reservoir of a capacity of 30,000,000 gallons should be constructed in the Centennial Park. The present high-level supply was 3,500,000 gallons. That the supply of water on low levels was adequate could be judged by the fact that the Prospect Reservoir had a capacity of 10,000,000,000 gallons. There was, however, a danger in case of two or three large fires occurring at the same time, and continuing for more than ten hours, of the high-level service being exhausted; and he considered the public had suffered a great loss by the adoption of the Prospect scheme instead of the Kenny's Hill scheme, which would have given an unlimited supply to the high levels of Sydney and suburbs. He thought that the public interest would be served by the appointment of a small board of works elected by the Government and the people to control water supply, sewerage and harbour and river works of the county of Cumberland, and to perform the duties of the present public works committee. The disastrous result of the recent fire at Lawler's was not due to construction, but was in his opinion due to the open spaces in the building, and an Act should be passed to prevent large open floor spaces. In conclusion, he quoted from the annual report of the Fire Brigades Board to show that the number of fires annually had decreased.

Mr. G. A. Mansfield said that there was not a city in the world which for its size and its age contained a larger proportion of good, sound, honest, building work than Sydney, and that to hold up to undeserved reproach our building contractors, our masons, carpenters, and bricklayers, was to libel in the most unjustifiable manner a large class of respectable honest men and worthy citizens. Indeed, the natural conditions which affected the supply of our building materials favoured good and substantial work. The chief dangers that beset Sydney come to us as a heritage from a former generation and constitute a risk for which no one now living could be held in any important degree responsible. They arose in a great measure from the manner in which the city was originally laid out, whereby difficulty was experienced in getting access to important centres to fight flames. The narrow lanes and *culs-de-sac* were fearful sources of danger to our plucky firemen, and as opportunity offered they should be done away with. Some limitation should be placed to the height to which a landowner should be permitted to run up a building, and some more stringent conditions imposed upon the construction of all buildings exceeding a given number of storeys.

Mr. Barlow (vice-president), Mr. Spain, Mr. Robertson, Mr. Davey (hon. secretary), Mr. McIntyre (of the Builders' and Contractors' Association), and Mr. Davidson also took part in the discussion.

The Chairman, in closing the meeting, said that Sydney was eminently liable to be destroyed by fire, and he could point to one spot in the centre of the city where, if a fire broke out, there was nothing in the world to prevent three-fourths of the entire block being destroyed.



Proposed Roman Catholic Cathedral for London.

SIR,—At the present time there is some talk about building a Roman Catholic cathedral in London. Since the destruction by fire of Old St. Paul's (originally belonging to the Roman Catholics) the Roman Catholics have not possessed a cathedral in this the largest city in the world. It is now proposed to erect a cathedral and the responsible authorities are asking for designs for a basilica or monastery. Allow me to point out that a basilica or monastery is not a cathedral. Any ecclesiastical architect ought to be aware of this fact. The difference between a basilica or monastery and a cathedral is as follows. At the end of the third century a basilica was a large hall used for the purposes of justice and commerce. After the conversion of Constantine the Great to Christianity, a considerable number of these halls passed into Christian hands and were used for Christian worship. The dark and dismal timber roof of a basilica has a depressing effect upon the worshipper instead of being light and soul elevating. A cathedral church in every diocese is that church in which the

bishop has his chair or seat. It is sometimes called simply domus, "the house" (duomo, Ital, Dom, Ger.), for as a "palace" sufficiently indicates the residence of a king, "so the Lord's house, which is the cathedral church, the palace of the King of kings, and the ordinary seat of the supreme pastor of a city and diocese, is sufficiently denoted by the single word domus." A contemporary of yours, writing upon the above subject matter, does not seem to know the difference between a basilica or monastery and a cathedral. What a cathedral church ought to be like we can judge by those of Italy, Spain, France and Germany, &c. What, for example, could be more soul inspiring to the worshipper than such an edifice as the Dom at Cologne? If the Roman Catholics of London wish to erect a cathedral worthy of its name they must not build a basilica or monastery, which is nothing but a copy of the old Roman hall of justice or commerce, and according to indisputable authorities no cathedral. Trusting you will favour me with space for this letter in your columns, I am, Sir, your obedient servant,

HENRY H. B. SANG,
Architect and Artist.

GENERAL.

H.E. Princess Edward of Saxe-Weimar has consented to open the annual sale and exhibition of work made by the members of "The Children's Salon," on December 20, 1894, at Westminster Town Hall, with a view to completing the endowment of a children's cot in the North-West London Hospital.

Mr. P. H. Rathbone read a paper at the last meeting of the Liverpool Architectural Society on "The Economic Value of Fine Architecture."

Dr. Christison, secretary of the Society of Antiquaries, has just opened the course of Rhind lectures in archæology in Edinburgh, his subject being "The Early Fortifications of Scotland."

The Art Gallery Committee of the Manchester Corporation have decided to purchase the collection of black and white drawings, 160 in number, executed by Mr. H. E. Tidmarsh for illustration of Mr. W. A. Shaw's recently published "Manchester, Old and New."

The "Céilidh," an old institution whereby Highlanders kept alive the traditions of their native hills and glens by meeting together in the evenings and recounting tales of interest and adventure, in a slightly modernised form has lately been revived by the High School Gaelic Class, under the presidency of Mr. Duncan Reid, F.S.L.A.

We Regret to announce the death of Mr. Septimus Oswald, architect, of Newcastle-on-Tyne, on the 26th ult., aged seventy-one years.

The Death is announced of Mr. A. B. Gibson, Newcastle-on-Tyne. Mr. Gibson, who was in his fortieth year, had practised as an architect in Newcastle for about twelve years, and designed several important works, and amongst them the Police and Fire Brigade Station in Westgate Road, several public baths and washhouses, the Walker Fever Hospital and St. Cuthbert's Church, Melbourne Street.

An Interesting Feature at the meeting of the Society of Architects on Tuesday next will be the exhibition of some rare and reference works in architecture. We understand that non-members of the Society desirous of inspecting these books and hearing Mr. Batsford's paper upon them and other works suitable for an architectural library, can obtain tickets of admission on application to the Secretary at the Offices of the Society, at St. James's Hall, Piccadilly, W.

An Inquiry was held in Chester on Wednesday before an officer of the Local Government Board respecting the application of the Town Council for permission to borrow 25,000*l.* for electric lighting.

An Injunction is to be applied for by the proprietors of the *South Wales Daily News* to restrain the contractors for the new Cardiff Post Office from proceeding, on account of interference with ancient lights.

The Spring Exhibition of the Manchester Academy will be held a month earlier than usual next year. The exhibition is obliged to close by the end of February, as the Corporation will require the building for the forthcoming Arts and Crafts Exhibition.

The German Emperor laid the last stone of the new Parliament House in Berlin on Wednesday.

The Collection of M. Garnier, the picture expert, who disappeared some time ago in circumstances that have never been cleared up, was sold in Paris on Tuesday. The sum realised was 27,069*l.* Millet's *Peasant Harrowing* was sold at 3,000*l.* his *Geese* at 1,520*l.*; Daubigny's *Landscape with Women Washing Clothes in a Brook* at 2,000*l.*; Corot's *Enfant Pêcheur* at 700*l.*; Diaz's *Forest Pool* at 600*l.*; a Troyon at 3,000*l.*

The Architect.

THE WEEK.

IN 1878 it was accepted without any doubt that the late Mr. HERBERT GRIBBLE, who was buried yesterday, was to be one of the fortunate architects of the century. He had just obtained the first place in the competition for the Oratory at Brompton, and on the recommendation of so competent a judge as Mr. WATERHOUSE, R.A. The conclusion was therefore warranted that Mr. GRIBBLE would not only possess a valuable commission but one that would bring him a select class of clients. At the time too he was a young man of thirty, whose powers were appreciated by men of his own age, who are generally the severest critics. He was also one of those architects who are obliged to sacrifice themselves to gain reputation for others, and if unknown to the world at the time of his success, he possessed experience as a designer. There was not much surprise among his friends when he gained the prize. As sometimes happens with important works, his great church did not, we believe, bring him the commissions that were anticipated. Before it was completed many things were introduced which diminished the architectural effect, and which must have given much pain to Mr. GRIBBLE. The completion of the exterior was also delayed, and that part is still in hand. But if the additions for which he was not responsible be abstracted, the building must be considered as among the most remarkable of our time. It has that Italian ecclesiastical character which was desired, although Mr. GRIBBLE's early experience was almost entirely confined to Gothic. Devonshire can justly include his name with her famous artists. He was born at Plymouth in 1847, and when he was sixteen he was articled to Mr. ALFRED NORMAN. Mr. GRIBBLE was about twenty when he came to London. He obtained an engagement in Mr. HANSOM's office and there remained for ten years. His spare time was spent in the South Kensington School, where he won the highest prizes of the department. He also made designs from time to time for other architects. His great natural abilities were strengthened by practice, and the success he attained was justly merited. If the opportunities were forthcoming he would have been equal to them.

GLASGOW does not exhibit many examples of old buildings. It is therefore wise on the part of the Corporation to preserve the Tron Steeple, although some of the citizens would be glad to see it removed as an obstruction. The special committee appointed to consider the subject have arranged that the ventilating opening which the Caledonian Railway Company are constructing to the east of the steeple, at the corner of Chisholm Street, will be screened by a façade of masonry which will harmonise with the architecture of the steeple. The plans of the buildings which the city improvement trustees intend to erect in Trongate, between the steeple and King Street, show that the frontage will be set back so as to line with the south wall of the Tron Steeple, leaving the western elevation, which is encroached on at present to the extent of 2 feet, entirely exposed. The architectural style of the street façade will be designed so as to harmonise in composition with the Tron Steeple, which is an example of late fifteenth-century work.

LOCAL boards must not imagine they are autocrats and are not obliged to give their reasons for refusing plans of new buildings which are submitted for approval. On November 12 Mr. GOULDING, a builder, lodged with the Swinton and Pendlebury Local Board plans and sections for forty-nine new houses or cottages which he proposed to erect on land which he had lately purchased. He sent with them a notice that on November 27 he intended to proceed with the buildings. On November 24 he received a letter from the clerk of the Board which stated:—"I am instructed to return to you the plans and sections for forty-nine cottages, and to inform you that they are not approved of by the Board." Mr. GOULDING thereupon resolved to apply for a mandamus. He made an affidavit that the plans were in accordance with the Public Health

Act, 1875, and the by-laws, and this was supported by the testimony of two skilled and experienced architects. Mr. GOULDING also declared that on several occasions he had asked the surveyor, the chairman and another member of the Board to give a reason for the rejection of the plans, but had always been met by a refusal; and that on one occasion the surveyor told him that his instructions were not to disclose the reason why the plans had been rejected. An application was accordingly made in the Queen's Bench Division on the builder's behalf by Mr. POLAND, Q.C. He argued that in such a case a Local Board had not an arbitrary power of rejection of building plans without any real ground or reason; they could only reject plans on some specific and intelligible ground. When they refused to state the grounds and reasons on which they had proceeded there was no remedy but an application to the court. A rule nisi for a mandamus was granted.

DURING the early part of this week the Palais de l'Industrie in the Champs Elysées appeared so animated that promenaders might be excused if they imagined that Time had grown oblivious, for the entrances to the Salon appeared as if April had come again. The fact was the time for sending in designs for the exhibition of 1900 had arrived. How many designs and drawings were received is not definitely stated. Six hundred and sixty copies of the instructions were issued, but they cannot all have inspired the possessors to try their fortune. The jury will consist of thirty-one members. Eleven will belong to the administration of the exhibition, ten will be nominated by the Minister of Commerce and ten will be elected by the competitors. The ministerial nominees are M. BARDOUX and M. BOURGEOIS, formerly Ministers of Public Instruction, the President of the Municipal Council of Paris, the Prefect of the Seine, the colonial delegate, the President of the Council of Roads and Bridges, the President of the Society of Civil Engineers, and the following architects, MM. BŒSWILWALD, DAUMET and CHARLES GARNIER. The members to represent the competitors are to be elected to-day. No competitor is to be among the jurors. As some of the designs will not be signed, precautions have been taken to insure that none of the authors can secure election. The author of every unsigned design must reveal his name confidentially to the commissary before he receives a voting paper, and any attempt to evade the rules will be followed by a declaration of ineligibility. The names of the architects who have signed their designs will be posted at the door of the Salon in which the election takes place. On the 20th inst. the designs will be exhibited. Eighteen will be selected, and premiums varying from 6,000 francs to 1,000 francs will be awarded to the authors. The administration reserve the right to make use of any or all of them, and if one of the designs is adopted the realisation of it can be confided, if thought necessary, to a different architect.

FROM its importance we must expect that the London Building Act which is about to come into operation will inspire several edited versions. We have received two. Mr. BANISTER FLETCHER'S (B. T. BATSFORD) has the advantage of introducing several diagrams, which for the lay mind are clearer than any verbal interpretation. He also gives the parts of the Metropolis Management Acts and others which were not repealed by the new Act. The by-laws that will be enforced are also introduced. An abstract of that part of the Act which directly relates to buildings has been prepared, and there is a comprehensive index. It is the law of building for London in one volume. Mr. FLETCHER treats the Act as the beginning of a new era. In the edition published by CROSBY LOCKWOOD & SON, and prepared by Mr. A. J. DAVID, B.A., LL.M., the differences between the old legislation and the new are pointed out in pithy notes. It is easy to repeal Acts, but the decisions of the Courts are of more enduring stuff, and Mr. DAVID refers to those which are likely to be applied in any litigation that may arise under the Act. The legal notes are invaluable, for by their aid the responsibilities of architects, builders and building owners are made clearer than by the unaided phraseology of the Act. Both editions have their use and both should be acquired.

SANCTA SOPHIA.*

IT is not often a book on an architectural subject appears in this country which is so captivating as the study of the Byzantine marvel which Messrs. LETHABY and SWAINSON have produced. From its history, associations and construction that building has almost a unique interest. There is no doubt it was long neglected by Western travellers as if it were valueless. Men like THACKERAY, who visited Constantinople in order to describe the things of note in the ancient capital, have come away without entering the building which surpasses all other creations to be found there. Architects would at the same period be no less indifferent. The Byzantine style was not appreciated because it was not understood. It was supposed to be a sort of mongrel combination in which the barbaric East was predominant. Now it is seen that, when the architecture is shown by an example like Sta Sophia, it sustains the severest of all tests—that of supplying a *raison d'être* for all the parts. Dedicated to the Spirit of Wisdom, the church may claim to be an inspired work. It is found, moreover, to be excellently adapted for its original use. Basilican, Gothic and Renaissance have become so identified with Western Christianity, it is natural to assume that one of them must be the ideal Christian style. Yet everyone who has carefully studied Sta Sophia must have misgivings about that conclusion. Among critics of architecture who would be competent to form a judgment on such a subject, probably two men could not be found whose principles were more at variance than JAMES FERGUSSON and THÉOPHILE GAUTIER. On that subject they agree. The former says:—"It remains even now an open question whether a Christian church exists anywhere, of any age, whose interior is so beautiful as that of this marvellous creation of old Byzantine art. . . . In fact, turn it as we will, and compare it as we may with any other buildings of its class, the verdict seems inevitable that Sta Sophia—internally, at least, for we may omit the consideration of the exterior, as unfinished—is the most perfect and most beautiful church which has yet been erected by any Christian people." The Frenchman is no less assured in his judgment. "Byzantine architecture," he writes, "is unquestionably the necessary style of Catholicism. Gothic architecture, whatever may be its religious value, does not so appropriately correspond with the creed. In spite of degradations of all sorts, Sta Sophia still surpasses all the Christian churches that I have seen, and they are many. There is nothing to equal the majesty of these domes, of these tribunes supported by columns of jasper, of porphyry, of verd-antique, with their bizarre Corinthian capitals in which animals, chimeras and crosses are interlaced with foliage. The grand art of Greece—it may be in a degenerated form—still impresses us in the temple, as if when CHRIST entered it, JUPITER had scarcely left it." Of late years no less unequivocal testimony to the worth of Sta Sophia has been borne by travellers from many lands.

Apart from its architectural greatness and its strange history, the church possesses an unique interest which, in a literary sense, may seem to be more important than the skill shown in arranging a wide base for the dome without making the precaution too prominent. Sta Sophia is the only building which has inspired a long poem. It is true a German critic describes that production as "byzantinischen Bombast," but as criticism upon the building itself has changed, we may conclude that the hexameters of PAUL the Silentiary will hereafter receive another sort of appreciation. Judging by his versicles, which are collected in the "Anthology," he must have been in request as a contributor to the albums of the fine ladies of Byzantium. But we doubt if HOMER or VIRGIL could have surpassed him in utilising the parts of a building for inspiration, and they could not show more reverence for art. PAUL appears to have witnessed the completion of Sta Sophia, as well as its reparation after the earthquake in A.D. 558, and his verses are invaluable because they express the vivid impressions which were produced when the church was perfect. The prose translation of the poem by itself is enough to give value to Messrs. LETHABY and SWAINSON'S book. The

variety of marbles employed in the church is suggested by the following passage:—

Who even in the measures of Homer shall sing the marble pastures gathered on the lofty walls and spreading pavement of the mighty church? These the iron with its metal tooth has gnawed—the fresh green from Carystus and many-coloured marble from the Phrygian range, in which a rosy blush mingles with white, or it shines bright with flowers of deep red and silver. There is a wealth of porphyry, too, powdered with bright stars that has once laden the river boat on the broad Nile. You would see an emerald green from Sparta, and the glittering marble with wavy veins which the tool has worked on the deep bosom of the Iassian hills, showing slanting streaks blood red and livid white. From the Lydian creek came the bright stone mingled with streaks of red. Stone, too, there is that the Libyan sun, warming with its golden light, has nurtured in the deep-bosomed clefts of the hills of the Moors, of crocus colouring glittering like gold; and the product of the Celtic crags, a wealth of crystals, like milk poured here and there on a flesh of glittering black. There is the precious onyx as if gold were shining through it; and the marble that the land of Atrax yields, not from some upland glen, but from the level plains; in parts fresh green as the sea or emerald stone, or again like blue cornflowers in grass, with here and there a drift of fallen snow—a sweet mingled contrast on the dark shining surface.

The great dome (which is about the same diameter as St. Paul's) it is well known is carried by semi-domes, which form the east and west ends of the nave, and by two arches 100 feet in span. The screen now within each arch is pierced with windows and would appear to be supported by two storeys of arcading. The poet gives the following description of that part of the church, which at the time was a more remarkable feat in construction than the Forth Bridge in our time:—

With dauntless pen I will describe what plan the Emperor devised for the broad church, and how, with builder's skill, both the curves of the arches and the vault of the wide extended house were formed with thin bricks and raised on firm foundations. Thus the skilful masterman, well versed in every craft, formed a ceiling to the lofty nave. Yet he did not send to the hills of Phœnician Lebanon, nor to search the dark woods of the Alpine crags, nor where some Assyrian or Celtic woodman goads on the oxen in dense forests, nor did he think to use fir or pine to roof the house. From neither the glades of Daphne by Orontes, nor from the wooded crags of Patara came cypress wood to form a covering for the mighty temple. For our noble king, since nature could produce no timber great enough, had it covered with stones laid in a round form. Thus on the four arches rose, like a beauteous helmet, the deep-bosomed, swelling roof; and it seems that the eye as it wanders round gazes on the circling heavens. And beneath the two great arches, to the east and to the west, you must know that it is all open and extended in the air. But towards the murmuring south wind and the cold dry north, a wall, mighty in strength, rises to the under side of the rounded arch. Now this wall is made bright with eight windows and rests below on great props of marble. For beneath it six columns, like the fresh green of the emerald, in union support untired the weight of walls. And these again are borne on strong columns fixed immovable on the ground; glittering jewels of Thessalian marble, with capitals above them like locks of golden hair. These separate the middle portion of the glorious nave from the neighbouring aisle that stretches alongside. Never were such columns, blooming with a many-hued brightness, hewn from the craggy hills of sea-washed Molossis.

As the church is (thanks to the conservative Turks) "one of the best preserved of ancient monuments," it is still easy after more than thirteen centuries to test the accuracy of the greater part of the poet's descriptions. But the sanctuary which was held in most reverence by the Christians was treated like the pictures and statues in English churches at the time of the Reformation. The iconostasis has disappeared. The secrecy which is one of the characteristics of the Greek as compared with the Western ritual was then omnipotent. There was an enclosure in which JUSTINIAN himself dare not enter. Although an outsider, the Emperor was lavish in beautifying it. The whiteness of silver made it the most fitting material for the iconostasis. PAUL tells us how JUSTINIAN "not only upon the walls which separate the holy priests from the crowd of singers has placed plates of silver, but has covered all the columns themselves with the silver metal, even six sets of twain, and the rays of light glitter far and wide. Upon them the tool has formed dazzling circles, beautifully wrought in skilled symmetry by the craftsman's hand. In parts stand up an army of winged angels in pairs, with bent necks and downcast mien." The ciborium was of silver arches resting on silver columns. The altar was still more precious, for says PAUL, "On columns of gold is raised the all gold slab of the holy table, standing on gold foundations and bright with the glitter of different stones." The Byzantines were famous for their textiles, and the curtains which were used to conceal the altar were wrought not only with

* *The Church of Sancta Sophia, Constantinople: a Study of Byzantine Building.* By W. R. Lethaby and Harold Swainson. (Macmillan & Co.)

figures of CHRIST, saints and angels, but with hospitals, churches and other tokens of works of mercy.

The poem also may help to remove one of the difficulties which cross the mind of those who study the famous building. What was the use of so great a dome? We cannot suppose that JUSTINIAN, with his architects, ANTHEMIUS and ISIDORUS, were only anxious to excel earlier efforts in construction. If they desired to have a dominating building in Byzantium, they would not have given so flat a contour to the dome. To gain effect for the mosque the Turks were compelled to erect four minarets. If we accept the words of PAUL the Silentiary, who describes the dome as bending over like the radiant heavens and embracing the church, it will then become symbolic. But the question arises, was any person more than another supposed to be embraced, or were the Emperor, the courtiers, the warriors and the people all alike in the position of miserable sinners before high Heaven? Now the poet tells us that under the dome was an ambo which in splendour rivalled the iconostasis. He uses his finest adjectives in describing it. The ostensible purpose of the ambo was to enable the priest to read the Gospel. The surviving Roman examples show that it was not considered necessary to ascend far above the people for that purpose. There were, no doubt, galleries in Sta Sophia which contained the superior people, but in the early days of Christianity they were not likely to be allowed extraordinary advantages. Was the ambo more closely associated with the emperors than is commonly supposed? At one time some of the ceremonies of a coronation were enacted on the ambo, and the structure may have represented the union of Church and State more clearly than is now supposed. In that case the importance given to the dome would be comprehensible.

For in Sta Sophia the dome is the key to the composition. We might suppose that ANTHEMIUS began with it. The predominance of curve lines is apparent at the first glance, and the sultans who presented the plaques with inscriptions from the Koran recognised that fact by making them circular. All the window openings have arched heads; the arcades are arched and many of the mosaics are set in circular borders. The capitals are not only of a more rational type than the Corinthian, but their contours are more emphatically curved.

A large part of the volume is occupied with a consideration of the methods that were likely to have been employed in the construction of the dome and of the other parts of the building. It is claimed that ANTHEMIUS was no mere administrator, who could work wonders by means of routine. "The master builders not only designed the church; they came 'and worked at every part,' and lived with their building until their death; they certainly graduated as workmen, and we hear nothing of their honours or position, only of their genius." In the words of M. CHOISY, "In JUSTINIAN'S time, to build was the essential rôle of the architect." The workman's individuality was also respected in Byzantium, for, says M. CHOISY, "The workman is no mere passive instrument, obedient, without any regard to initiative or responsibility; he is treated as an intelligent power and finds in front of him liberty, and a field open to his imagination." In whatever way they were organised the workmen employed at Sta Sophia were efficient. The site is not stable and has been subjected to earthquakes, but the building has survived many younger examples. Restorations were occasionally required and in 1847 much was done by FOSSATI, and since then by others, which is to be regretted. But, taken as a whole, the condition of the church after the wear and tear of thirteen centuries is a triumph of building.

It is not allowable to make such an examination of Sta Sophia as would be desirable in order to describe all the details of construction. Messrs. LETHABY and SWAINSON have so well supplemented their own observations by what is said by SALZENBERG and other writers, that their account of the "building procedure" appears to be ample. That part of the book will be a surprise to many readers, especially as it suggests the prevalence of a system of carrying out works which has not become obsolete in Turkey and the East. The following extract about the marble facing will suggest the care that was taken:—

At Sta Sophia the application of the thin sheathing and incrustations (the "crustæ" of Pliny) of the "delectable variety" of marbles

is made in many ways. First, there are the large sheets of the greyish Proconnesian, opened out side by side so that the veining of one follows from the next. Then the richer varieties are set in bands and panels, with narrow notched fillets between them, and still more precious slabs are framed round with carved margins of white. Over the doors entering the aisles at the west there are panels, with especially wide and rich borders of meanders growing from chalcises. The large panels are very often of two pieces, with matched veining. All the wall plating is arranged with delightful variety as to size, and in the alternate placing of light against dark, so that there is no rigidity or over accurate setting out. Besides this constant change of size, colour and arrangement, there is a great variety in the surface treatment. We have the shallow channelling into continuous mouldings of the skirtings, some portion of which has a stiff fret sunk in the surface in addition. Then there are panels on either side of the great door, and on the faces of the projections from the great piers in the aisles, coming just above the eye, of plain russet red or brown, which bear severe abstract patterns, made out by slight sinking into the surface. The centre in some cases is overlaid with an oval or square of another precious material, such as red or green porphyry or the onyx; the whole of the sunk portions may have been filled by inlays, or in some the sinking alone may have formed the design. The upper part of the bema is encrusted with slabs patterned in this way, and here the sunk portions are entirely inlaid. In this work "casements" are sunk into the rosso or other deep coloured field, and green porphyry and other materials, set off by yellowish white lines and spaces, are inlaid in geometrical panels or friezes of stiff foliage. . . . This uttermost splendour is quiet and soft in its result. The surface, of course, has not that mechanically even, repellently smooth, painfully fitted appearance of modern work. The planes are waved under the hand sawing, and the face is smooth but hardly polished. The colour, in consequence, grey and russet rising to full yellow, green and reds, veined, waved and flowered in all manner of gradations and lovely combinations, vibrates with a wonderful bloom, which doubtless owes much to age; but it is very probable that the marble was polished with wax encaustic, which was so generally used for finishing surfaces by ancient workers.

There are other parts of the book which, if space were at our disposal, we should like to notice, such as the chapters on the history of the church, the buildings that are attached to it (for as GAUTHIER says, "Toute la vie musulmane gravite autour de la maison de Dieu"), the restorations, &c. But all the pages of the book are so interesting it is difficult to make a selection among them, and the extracts we have given are only ordinary samples of the varied contents.

Lady MARY MONTAGU was courageous when she declared that "St. Paul's would cut a strange figure by Sta Sophia." As comparisons are inevitable when dealing with architecture, some critics will side with her ladyship; others will, like BYRON, "speak like a cockney" and stand up for the London cathedral. If it be asked which of the two affords the best lessons in art and construction, the verdict must be given in favour of the older building. But the teaching does not mean supplying an infinitude of details which can be applied indiscriminately. It is rather in inspiring such a belief as the authors of the book before us attained when they say:—

A conviction of the necessity for finding the root of architecture once again in sound common-sense building and pleasurable craftsmanship remains as the final result of our study of Sta Sophia, that marvellous work where, as has so well been said, there is no part where the principles of rational construction are not applied with "hardiesse" and "franchise." In estimating so highly the Byzantine method of building in its greatest example, we see that its forms and results directly depended on then present circumstances and then ordinary materials. It is evident that the style cannot be copied by our attempting to imitate Byzantine builders; only by being ourselves and free can our work be reasonable, and if reasonable, like theirs, universal. *L'Art c'est d'être absolument soi-même.*

ROYAL ACADEMY SCHOOLS.

ON Monday evening the prizes awarded to the successful students of the Royal Academy Schools were presented by Sir Frederic Leighton.

The President in a brief address said that he had to express commendation in respect of one particular class in the competitions, namely, the classic competition. The general feeling of the judges was that, irrespective of certain works which were of special merit, the whole of the work was of an extremely high and commendable character. In the set of six studies from the life the level was not such as they had been sometimes accustomed to, not such as they would see next year, not such as they would desire to have it in a branch which was vital to the efficiency of art. The class of decorative design for a public building was one to which they attached very high importance because of its immense potentialities for public use in this country. Several extremely careful and pretty designs had been sent in, he had almost said pictures, and they had

suggested to him one or two points to which he wished to draw their attention. The first was the absolute necessity of aiming at a broad and dignified and monumental simplicity, such as should characterise that class of work and distinguish it from other branches, such as easel painting. He also wished to point out the importance of bestowing as much care as they possibly could on the supplementary, the accompanying, study of a fragment of their design, because those designs were sent in in order that they might test the capacity of the student to carry out the work on a larger scale than in the design.

The prizes were as follows:—Landscape painting—a moorland—Creswick prize (30%), Percy William Gibbs. Painting of a figure from the life (open to male students only)—silver medal, 1st, Percy William Gibbs; silver medal, 2nd, Owen Baxter Morgan. Painting of a head from the life—silver medal, 1st, Edith Lydia Clink; silver medal, 2nd, Isabel C. Pyke-Nott. Painting of a draped figure (open to female students only)—silver medal, 1st, Emily Florence Watters; silver medal, 2nd, Katherine Mary Willis. Cartoon of a draped figure—a draped figure of the goddess Ceres—silver medal and prize (25%), Rose Livesay. Design in monochrome for a figure picture—Shadrach, Mesbach and Abed-nego in the fiery furnace (Daniel iii. 21)—Armitage prizes, 1st (30%) and bronze medal, Victor John Robertson; 2nd (10%), George Radolph Aylmer. Design for the decoration of a portion of a public building—a vintage—prize (40%), Hilda Koe. Set of six drawings of a figure from the life (open to male students only)—1st prize (50%) and silver medal, not awarded; 2nd (25%), Shirley Charles L. Slocombe, disqualified owing to having received the same prize before; 3rd (15%), Charles Augustus Büchel, disqualified owing to having received the same prize before; 4th (10%), Owen Baxter Morgan. Drawing of a head from the life—silver medal, 1st, Morris Bernstein; silver medal, 2nd, Gerard R. T. Leigh Hunt, disqualified owing to having received the same prize before. Drawing of a statue or group—silver medal, 1st, not awarded; silver medal, 2nd, Allan D. Davidson. Perspective drawing in outline (open to painters and sculptors only)—the small cloisters of Westminster Abbey—silver medal, no competition. Model of a design—the Fates—1st prize (30%), Francis Derwent Wood; 2nd (10%), Frederick Thomas. Set of three models of a figure from the life (open to male students only)—1st prize (50%) and silver medal, Henry Poole; 2nd (20%), William Willis. Model of a bust from the life (open to female students only)—silver medal, 1st, not awarded; silver medal, 2nd, Emily Florence Watters. Model of a design containing figure and ornament—grape gathering, the vine to be treated decoratively—silver medal, not awarded. Model of a statue or group—silver medal, 1st, Hibbert Charles Binney; silver medal, 2nd, Margaret C. T. G. Thurlow. Design in architecture—a public library in town—travelling studentship (60%), Percy Edward Newton. Set of architectural drawings—the banqueting-hall, now called the orangery, Kensington Gardens—silver medal, 1st, George Weald; silver medal, 2nd, Pieter Rodeck. Set of architectural designs (upper school)—prize (25%), Henry Seton Morris. Set of drawings of an architectural design (lower school)—prize (10%), Cecil Claude Brewer. Plan of a building—a Government school of art for a large manufacturing town—prize (10%), Ernest Tatham Richmond. Original composition in ornament—silver medal, no competition. Perspective drawing in outline open to architects only—Hanover Chapel, exterior—silver medal, George J. J. Lacy. The Landseer scholarships in painting and sculpture of 40% a year each, tenable for two years, have been awarded—in painting, to Shirley C. L. Slocombe and Percy William Gibbs; in sculpture, to Henry Poole and Robert Edward C. F. Glassby.

ARCHITECTURAL BOOKS.*

By HERBERT BATSFORD.

WHEN I received the honour of an invitation to read a paper before your Society on architectural books, I felt very diffident as to accepting it, for it occurred to me that the subject was one of which many of you might think you had already heard enough, and at the same time I realised the difficulty ahead in deciding from what standpoint I should take up the subject so as to impart fresh interest to it, if I accepted your secretary's invitation.

I therefore consulted him upon this point, and after some consideration we agreed that I should start upon some such—shall I say improbable?—hypothesis as that an architectural society desirous of forming a good reference library of architectural books had asked my advice as to which, assuming reasonable means, they should proceed to acquire. I propose to enumerate to you most of the books which in my opinion should be in such a library, and to make the briefest possible

comments upon some of them. At the suggestion of your secretary and in the hope that it may add to the interest of my remarks, we have displayed here some of those which I think are likely to be most interesting to you, although I regret it is impossible on this occasion to place before you all the books which I think worthy of your attention or to which I may refer.

Owing to the limited time at my command I shall be obliged to content myself with reading out the names of many without making any comment on them, and naturally some omissions from my list will occur to you, omissions which I must leave you to fill at your discretion. My object is to speak chiefly of those books which in my judgment are essential to the formation of a reference library upon architecture and the closely allied art of decoration.

Before proceeding further I am anxious to make a personal explanation. It would savour of egotism in me were I not to assure you that on this occasion I am representing also my father and brother, of whose wide knowledge and long experience I have had the full advantage.

I shall not attempt to wax eloquent in praise of architectural books, or to dilate upon the pleasure or advantage to be derived from their study, for that has already been well done by your late esteemed secretary, Mr. Middleton, and more recently by Professor Roger Smith, both of whose papers I had the pleasure of hearing. My remarks will be confined to an endeavour to point out the special character or interest of the work referred to. I must confess I was a little surprised when I saw an announcement that my paper would have some special reference to rare books. This, I think, arises from a little misconception on the part of your secretary. In truth there are not many rare architectural books, and for the most part they are, I think, useless in proportion to their rarity. They are luxuries to be acquired only by libraries far more extensive and costly than such as we are about to consider. The Royal Institute of British Architects somewhat recently acquired an *editio princeps* of Vitruvius, the rarest architectural book I know, and a possession to be coveted no doubt, but in our reference library Gwilt's or Wilkin's translation would find a more fitting place.

To come now to the subject of my paper. If I were asked to define in general terms what kind of books I thought essential to such a library as we are about to consider, I should reply, all such books as a student might reasonably be expected to consult in his architectural studies, or to which an architect might have occasion to refer in the course of his practice; and first amongst them one would naturally place such works as dictionaries, cyclopædias, general histories, journals and other serial publications pertaining to or illustrating the subject. Then I think there should be found one at least of the most authoritative and important works illustrating each of the various historic styles or periods of architecture in all countries, amongst which I would include important monographs upon some of the most remarkable edifices in the world. Next may be considered a class of works by no means so numerous as it might be, that devoted to public buildings and institutions, such as theatres, hospitals, markets and other municipal buildings, to which I would add some examples at least of the works of contemporary architects at home and abroad. Beyond these there remains the important subject of practical construction, sanitation, &c. There are, too, a few architectural biographies, and I would recommend any public library to acquire them all, for nothing I think could be more inspiring to a student than to read the memoirs of Pugin, Barry, Scott and the other great professors of their art. Milizia's "Lives of the Celebrated Architects" up to the end of the eighteenth century, translated by Mrs. Edward Cresy, should certainly be included amongst these.

I will now proceed to lay before you my list of books. First amongst the "special books of reference" I have placed that remarkable work the "Dictionary of Architecture," published by the Architectural Publication Society, and which was completed chiefly under the able and untiring editorship of the late Mr. Wyatt Papworth and the fostering care of Mr. Arthur Cates, who remained true to his post of honorary secretary from its inception to its completion.

Professor Roger Smith, in a recent lecture delivered at the University College, on "Discoveries in Architecture," spoke of it as a book bristling with sign-posts, calculated to "direct the student in his search of knowledge to the best sources of information." He said, also, that "in all the articles the most copious list of references occur," and that "it is of the greatest use to a student to have sources of information so liberally spread before his view." After this I need only add that the book contains 2,300 folio pages of text and some 250 plates, besides other illustrations in the text.

I am sure the next book you expect me to mention is Gwilt's "Encyclopædia of Architecture," and the mere mention of it will be sufficient. With Gwilt's "Encyclopædia" I am disposed to bracket Parker's "Glossary of Terms used (particularly) in Gothic Architecture," three volumes, 8vo, the illustrations of which are delightfully drawn and engraved.

* A paper read before the Society of Architects on Tuesday, December 11, the president, Mr. E. J. Hamilton, in the chair.

There are two exceedingly good dictionaries which are not, I think, so well known in this country as they deserve to be; they are Bosc's "Dictionnaire Raisonné d'Architecture," four volumes, with 4,000 illustrations, and Chabat's "Dictionnaire des Termes employés dans la Construction," the most comprehensive dictionary of terms used in construction extant. Amongst "reference books" I should also include the following:—D'Agincourt's well-known "History of Art by its Monuments," which has over 3,000 small illustrations, and the English edition of which was edited by Owen Jones; Fergusson's "History of Architecture," now in five volumes, which needs no comment of mine; Gailhabaud's "Monuments Anciens et Modernes," a work which illustrates on 400 steel plates a large number of the principal buildings of all ages in a clear and correct manner. I almost hesitate to include in this class Viollet-le-Duc's celebrated books, "Dictionnaire de l'Architecture Française du X. au XIV. Siècle," "Dictionnaire du Mobilier Français," for although they are entitled "Dictionnaires," they are really something more, and the same may be said of Havard's "Dictionnaire de l'Ameublement et de la Décoration." Of these I shall have something further to say later on.

Some of the finest works ever produced have been devoted to ancient art in Egypt and Western Asia, notably that of Champollion, "Monuments de l'Égypte et de la Nubie," four volumes, folio; that known as "Napoleon's Egypt," being the result of an expedition sent out by him (Napoleon I.), twenty-one volumes, folio; and that of Von Lepsius, in twelve volumes, the result of a similar expedition, aided by the King of Prussia; but the latest important work upon Egypt is that of Prisse d'Avennes, which is confined to architecture and the auxiliary arts, and if either of these large works be necessary in our library, I should give preference to it, although I believe Egyptologists prefer one or other of the older works. I must just mention here the valuable work, "Monuments of Nineveh," by the late Sir Austen H. Layard, published in 1849-53, and the more recent French work, "Monuments de Ninive et l'Assyrie," by Victor Place, 3 volumes, folio; and the Comte de Vogue's work in two volumes, entitled "L'Architecture dans la Syrie Centrale." I am, however, disposed to think that the handy series of volumes produced by those zealous Frenchmen, MM. Perrot and Chipiez, would be as much upon this early period as is required. It is a cause for satisfaction that they have been translated. The English editions are on the table. They deal with the history of art in Phœnicia, Cyprus and Asia Minor; Ancient Egypt; Chaldaea and Assyria; Sardinia and Judæa; Persia; Phrygia; and Primitive Greece.

Indian architecture unhappily has not been illustrated in a manner worthy of the subject. When we look at the grand books published in France on Eastern art, we can form some idea of the elaborate works which would have been produced had India been a French instead of a British possession. It is true volumes illustrating special surveys have been published, but for an historical view of the subject we must consult Mr. Fergusson's volume dealing with Indian and Eastern work, and a very interesting volume recently published in France by Monsieur Le Bon, entitled "Monuments de l'Inde," and I should mention a very useful series of six portfolios of architectural details, drawn by natives under the direction of Colonel Jacobs, which was published in 1890.

Turning now to Grecian architecture, the first book which it occurs to me to mention is that splendid monument of patient research, Stuart and Revett's "Antiquities of Athens." The first volume was published in 1762 and the fourth in 1816, and in 1830 a volume which can form a supplement to "Stuart and Revett" was issued, illustrating further antiquities in Greece, the result of a visit there by T. L. Donaldson and Professor Cockerell. Let us pause for a moment to compare the manner of production of say the first plate of Stuart's book with that of the plate of St. Paul's Cathedral before us. In the first case the drawing has been made, at what expenditure of ability and patience I may well leave you to judge, then the engraving on copper, by an artist of repute, at considerable cost, and taking weeks perhaps months to finish; in the other case a photograph has been taken, not of course without difficulty, but the actual process occupying but a few seconds of time, and the reproduction known as "collotype" is made in a few hours at a fractional cost of the old engraving. But at the time of which we are speaking it was the fashion to patronise antiquarian and architectural publications, and if you look at the list of subscribers to be found, almost invariably, at the commencement of the books of the period, you will find that a large number of the nobility and members of county families were subscribers for them, although probably few of these subscribers took much heed of them afterwards.

Stuart's "Athens" was quickly followed by the publication of the first volume of the "Ionian Antiquities," issued by the Dilettanti Society, and it is curious to note that although the Society announce themselves as "some gentlemen who had travelled in Italy," the only books they published illustrate

Greek art. They include the "Antiquities of Ionia," four volumes, volume four issued so late as 1881; "Unedited Antiquities of Attica;" "Specimens of Ancient Sculpture," two volumes; Penrose's "Principles of Athenian Architecture." All these volumes are beautifully engraved, and a second edition of Mr. Penrose's work was issued in 1888. It is, however, to be regretted that in their desire to encourage the study of Greek art they did not see their way to issue this work at a price within the reach of many, instead of a very limited few. Other books which I regard as necessary are Cockerell's "Temples at Aegina and Bassae," Wilkin's "Antiquities of Magna Graecia," and Inwood's "Erechtheion at Athens." Considering the importance of Greek art and the attention now being bestowed upon it, I should advise the acquisition of all these works, but beyond "Stuart and Revett" Penrose is at least an "essential."

Turning now to Roman architecture, I will first mention the works of that marvellous artist Piranesi, who in some twenty-five years published more than thirty folio volumes, containing upwards of 2,500 engravings, illustrating the architectural antiquities of Rome. The force and vigour which he gave to his work have caused him to be known as the "Rembrandt of Architecture." With mingled feelings I would add, on the authority of Bryan's "Dictionary of Painters and Engravers," that he on two occasions attempted to practise as an architect, but apparently clients were not forthcoming. Some examples of his engravings are on the table. Although I do not propose to overweight our "library" with any considerable number of his plates, some at least are worthy of a place, both for the subjects they illustrate, and the unique quality of the drawing. On ancient Rome the most thoroughly architectural, I was about saying "practical," work is Taylor and Cressy's "Architectural Antiquities of Rome," a worthy companion to Stuart's "Antiquities of Athens," with plates almost equal in beauty (two volumes), published in 1831. Cameron's "Baths of the Romans" is valuable, as giving illustrations of the Baths of Titus, the ceilings of which inspired Raphael in designing the arabesques of the Loggia at the Vatican. A very valuable work on Roman construction is M. Choisy's "L'Art de Bâtir chez les Romains." The folios by Robert Wood on the "Ruins of Palmyra and Baalbec," and Robert Adam's folio on the "Palace of the Emperor Diocletian at Spalatro," all published about the middle of last century, should certainly be added to the library, as they worthily illustrate the remains existing at that time of these examples of Roman splendour, which undoubtedly greatly influenced the Brothers Adam in the design of their many works, most of which are to be found within a mile or so of this hall.

On Pompeian architecture and art, the most complete work is the very beautiful and elaborate one by Niccolini, still in course of publication, although upwards of eighty parts are already issued. This is far too extensive and costly a work to be included in a moderate library; and for architecture, Mazois's "Les Ruines de Pompéi," four volumes, folio, published between 1812 and 1838, or Gell and Gandy's "Pompeiana," a copy of which you will find in the room, four volumes, published between 1817 and 1837, or the two folio volumes of drawings, beautifully engraved by W. B. Cooke, with descriptions by Professor Donaldson, published in 1827, may well be substituted. For illustrations of the wonderful painted walls of Pompeii, I place above all Cavalier d'Amelio's magnificent series of plates, entitled "Pompei Dipinti Murali Scelti," recently issued. Of this a copy is on the table. On the authority of the Cavalier himself, I may assure you that the brilliant colours of these plates are absolutely faithful to the originals when first excavated, and before the action of the atmosphere affects them, which it does very rapidly after their long burial.

The following books illustrating the Orders and architectural ornaments, both Grecian and Roman, must not be omitted. Normand's "Parallèle des Ordres de l'Architecture," an English edition of which it is interesting to note was edited by the elder Pugin and published in 1829. Mauch's "Architektonische Ordnungen," which has been reissued with a supplement as late as 1875, Sir William Chambers's celebrated "Treatise on the Decorative Part of Civil Architecture," Tatham's "Etchings of Architectural Ornament," Vulliamy's "Examples of Ornamental Sculpture in Architecture," and Mr. Spiers's "Orders of Architecture," which is chiefly a selection of plates from Normand and Mauch.

I feel obliged to make a somewhat general grouping of works on Byzantine, Early Christian, Romanesque, Saracenic and Mohammedan architecture. Taking the first of these the authorities are Texier and Pullan's "Byzantine Architecture," Salzenberg's elaborate monograph on Sta Sophia at Constantinople, and that very correct and valuable work, "L'Architecture Chrétienne," by Hubsch; this is a careful parallel of the early Byzantine churches and basilicas. The author is a German, and the book was first published in Germany, but a French edition was also published under the title I have given. Another very valuable work on this period of art is "L'Art de Bâtir

chez les Byzantins," by M. Choisy, a companion to his work on Roman building, which I have already mentioned in terms of commendation. But above all works on this period of art comes that remarkable monograph, completed only within the last few months, although commenced nearly twenty years ago, on St. Mark's, at Venice. The publisher, Signor Ongania, in his enthusiasm for the splendid monument under the shadow of which he spends his days, has issued this most exhaustive work almost regardless of expense, and, I fear, without commercial benefit. We have here the volume of coloured plates, part of which forms a view of the front upon such a scale as I think no other building has ever been illustrated. These plates and the two portfolios of details, which are also here, will give you some idea of the magnificent manner in which the book has been produced. Surely a publication so worthily illustrating the grandest building of the world should find its way into every public architectural library, although I believe I am correct in saying that it is not to be found in any such library in England. I know it is in some public libraries, notably Liverpool, which can boast of one of the richest collections of architectural books in the country.

Then there are Darstein's work, one of great research, entitled "Etude sur l'architecture Lombarde;" Mr. T. G. Jackson's work in three volumes, 8vo, published in 1887, the result of visits to the Dalmatian district; and the fine book by Revoil, three volumes, folio, entitled "Architecture Romane du Midi de la France." This has mainly been the source of inspiration for the style introduced into America by the late Henry Hobson Richardson, and since imitated by so many of his followers with a sad lack of his original and vigorous treatment. For Saracenic work I need only mention that of Gally Knight, entitled "Saracenic and Norman Remains in Sicily," and a recent work published in America, called "Norman Monuments of Palermo and Environs."

Arabian art has been splendidly illustrated in Prisse d'Avenne's magnificent work, "L'Art Arabe," in three volumes, folio, with a quarto volume of text—a work which displays in its beautiful plates remarkable examples of architecture and the subsidiary arts from the twelfth to the eighteenth century. Another beautiful work which is full of detail of Arabian work is that of M. Jules Bourgoïn, entitled "Les Arts Arabes."

It is some source of satisfaction that the great monument of Moorish art, the Alhambra Palace, at Granada, published in two grand volumes in 1842, and which is one of the grandest books illustrating one building ever published in this country, is mostly the work of an eminent Englishman, the well-known Owen Jones, who with M. Gourey went and stayed six months in the Alhambra during 1834, preparing some of the drawings for this work, and on the death of M. Gourey through cholera caught there returned home, but revisited the Alhambra in 1837, finishing the drawings for the remarkable monograph, a copy of which is here. You will, I am sure, feel that this book has special claims on your attention.

(To be concluded.)

The vote of thanks was proposed by Mr. E. J. Kibblewhite, seconded by Mr. G. A. T. Middleton, A.R.I.B.A., and supported by Mr. William Woodward, A.R.I.B.A., Mr. Quinn, librarian of Chelsea Public Library, and others.

GLASGOW ARCHITECTURAL ASSOCIATION.

At the meeting of this Association, the president, Mr. A. N. Paterson, in the chair, Mr. Charles J. Davidson read a paper on "The Planning of Farmhouses." Dividing the subject into three classes—sheep farms, dairy farms and stock-rearing farms—the different requirements of each were explained in great detail. The buildings connected with sheep farms are few and consist usually of a house for the farmer, with small barn, wool-house and poultry-house. Dairy farms for the keeping and rearing of cows are more elaborate. The byre is the largest of the buildings, and along with the dairy and scullery forms the principal feature of the steading. In a stock-rearing farm the principal object is to provide for the accommodation and rearing of large numbers of cattle. The arable land of such farms is cropped mainly for the purposes of fodder and bedding. In referring to the domestic arrangements it was remarked that in no department of farm planning is reform more urgently required than in the sleeping apartments appropriated to farm servants, which are in a large number of cases such as merit extreme reprobation, and are disgraceful to the farmers and their landlords. In the disposition and grouping of the various buildings, the leading object to be arrived at in the arrangement of the plan is economy of time and labour in the performance of the work to be carried on. To this end the two main principles to be observed are:—(1) That there should be an immediate connection between those buildings and apartments whose usefulness depends upon each other; and (2) that houses used for analogous purposes should, as far as possible, be classified and arranged together. Treating of the

architectural appearances of farmhouses, Mr. Davidson said that in some cases the whole steading can be arranged symmetrically; and where this is not attainable, the extended lines of buildings, the varying outline caused by the different heights and the numerous gables seldom fail to give a certain degree of piquancy and picturesqueness. The paper was illustrated throughout by reference to a number of plans and diagrams hung upon the walls.

LIVERPOOL ARCHITECTURAL SOCIETY.

As mentioned in *The Architect* last week, Mr. P. H. Rathbone read a paper on "The Economic Value of Fine Architecture." He remarked that the necessities of life being now supplied by a fraction of the population, the question was how were we to provide employment for the remainder so as to enable them to remunerate the providers of the necessities. The wealth of a country really consisted in the possession of the means to use the higher intellectual powers and to supply the needs created by them. One city became wealthier than another by accident. The permanence of its prosperity depended on the use it made of the wealth it accumulated. They could not get a sense of citizenship by any amount of mean, ignoble streets; but by erecting noble public buildings remarkable not only for their size, but also for that beauty of decoration which formulated the nobler and finer feelings of citizens not unworthy of the highest and most developed form of humanity. That was as true in regard to architecture as to other forms of art and literature. The future greatness of cities would be in proportion to the skill of their artisans. The future of Liverpool as a city containing a large and intelligent body of men fitted to be the leaders of civilisation depended upon their success in educating and employing a large body of artisans, and giving to them monuments and buildings which would create a society to which the best of all schools would be proud to belong. They trusted that the new school of architecture and applied arts in Liverpool would receive the support of the municipality and the public. Some Liverpool improvements that would not last fifty years had cost half a million sterling, and half a million judiciously employed might construct a building celebrated throughout the world. Owing to the telephone and telegraph, people could transact business at a distance, and the great master minds would settle themselves where there was the greatest intellectual life and enjoyment, leaving the hewers of wood and drawers of water to occupy the back yards of civilisation. Architecture was almost the only means of affording a visible impression of the greatness and intellectual superiority of a city. Its rapid strides in fine buildings had placed London among the capitals of Europe; but during the last fifty years Liverpool had not built a single building which could be reckoned among the chief buildings of the Continent. There was no want of wealth, and they had men quite capable of designing, and a population which, if instructed, might become the finest body of artisans in the world.

TESSERÆ.

Cimon's Influence in Athens.

CIMON was the friend of every genius and every art; and, the link between the lavish ostentation of Themistocles and the intellectual grace of Pericles, he conducted as it were the insensible transition from the age of warlike glory to that of civil pre-eminence. He may be said to have greatly contributed to diffuse that atmosphere of poetry and of pleasure which even the meanest of the free Athenians afterwards delighted to breathe. He led the citizens more and more from the recesses of private life, and carried out that social policy commenced by Pisistratus, according to which all individual habits became merged into one animated, complex and excited public. Thus, himself gay and convivial, addicted to company, wine and women, he encouraged shows and spectacles, and invested them with new magnificence; he embellished the city with public buildings, and was the first to erect at Athens those long colonnades beneath the shade of which, sheltered from the western suns, that graceful people were accustomed to assemble and converse. The Agora, that universal home of the citizens, was planted by him with the oriental planes; and the groves of Academe, the immortal haunt of Plato, were his work. That celebrated garden, associated with the grateful and bright remembrances of all which poetry can lend to wisdom, was, before the time of Cimon, a waste and uncultivated spot. It was his hand that intersected it with walks and alleys, and that poured through its green retreats the ornamental waters, so refreshing in those climes, and not common in the dry Attic soil, which now meandered in living streams and now sparkled into fountains. Besides these works to embellish, he formed others to fortify the city. He completed the citadel, hitherto unguarded on the south side; and it was from the barbarian spoils deposited in the treasury that the expenses of founding the long walls, afterwards completed, were defrayed.

The Destruction of Pompeii.

It is commonly but erroneously supposed that the town was overwhelmed by lava ejected from the crater of the volcano. Such lava streams, like broad watercourses of black rock, may be traced down the sides of Vesuvius; some may be of the date of the great eruption which destroyed the town, but it is certain that none of them reached the town itself. Pompeii owed its destruction to two causes. Ashes and small pumice stones, like white cinders, were thrown out of the crater and fell in dense showers over the surrounding country. They were probably carried to a considerable distance by the wind, but the greater part seems to have fallen on the coast between the foot of the mountain and the sea on which Herculaneum, Pompeii and Stabiae stood. The Italians call these pumice stones "rapillo," or "lapillo;" in the earlier records the former word is used. In addition to the "lapillo," torrents of mud, formed by ashes, lava and other volcanic matter, mingled with water abundantly ejected from the crater, rolled down the mountain side, and spreading in broad streams as they reached the lower country, completely covered everything within their reach. This thick mud, called by the Italians "lava bavosa," accumulated wherever it was checked, and penetrating into every nook and cranny, soon hardened and encased every object with which it was brought into contact. In its hard state it is called "tuono." In uncovering the ruins, the mode in which they were buried is distinctly traceable. The small loose pumice stones, or "lapillo," and the hardened mud are found in well-defined strata or layers, sometimes running one into the other, like what geologists call "faults." The "lapillo" usually forms the lowest stratum, covering the pavement of the streets and the floors of the lower rooms to the depth of many feet, thus proving that the town was first overwhelmed by the showers of pumice stones. The cellars and places into which the "lapillo" could not penetrate are filled with the hardened mud which succeeded to the pumice stones, and above which it lies in distinct layers. It cannot be ascertained precisely how deep the town was buried by the eruption of A.D. 79. Some of the strata of volcanic substances above the ruins came from subsequent eruptions. The height of the various strata from the level of the plain upon which the town was built to the present surface appears to vary between 20 and 40 feet. Sir William Gell thus describes a section of the strata near the amphitheatre to the height of 20 feet:—"Separating the whole into five portions, we shall find the first three to consist of pumice stone in small pieces, resembling a light white cinder, and covering the pavement to the depth of 12 feet; the next portion is composed of six parts, beginning with a stratum of small black stones, not more than 3 inches in thickness; to this succeeds a layer of mud or earth, which has been mixed with water and appears to have been deposited in a liquid state; upon this lies another thin stratum of little stones of a mixed hue, in which blue predominates; a second stratum of mud separated from a third by a thin wavy line of mixed blue stones, completes the fourth portion; while the fifth or highest division consists entirely of vegetable earth, principally formed by the gradual decomposition of the volcanic matter."

The Pelasgians in Greece.

One honest tradition, admitted even into the pages of Plato, contradicts the poetical theory of aboriginal savage life and attests the existence of a primitive Greek civilisation. The Pelasgians of Greece, like the earliest inhabitants of many other lands, accommodated themselves to the varying features of the country. According to that patriarchal division of pursuits, dictated and maintained by the very aspect of the earth we dwell on, some were "keepers of sheep" and some were "tillers of the ground." They had the eye of the grazier for healthful pastures. They had the instinct of the farmer for rich plains. They had the political tact, as in the case of the settlers in Attica, sometimes to prefer those situations wherein local defects held forth a promise of unmolested possession to regions of greater fertility, but therefore of greater insecurity; the "dinner of herbs" with peace to the "stalled ox" with danger. Their polygonal architecture was ingenious in its characteristic device, and has chronicled its own tale in traces that are still legible. They practised the art of navigation. They founded ancient thrones, and here and there, if probable inferences may be drawn from words of Aristotle's, struck out the rudiments of the representative system. Their language, involving in its structure the chief germs of the Hellenic and Latin tongues, exhibited those beautiful principles taught by the philosophy of nature, from which the best forms of modern speech have more or less degenerated. The charms of song were not unknown to them, nor unknown were either the mystic rites of the oracular shrine or the cheerful ceremonies of the religious festival. Strangers, it is true, at last are seen to mix with the Pelasgic population, but their figures must be kept to the background of the stage. Even on the Athenian faith and works of art are stamped some traits of the Egyptian physiognomy. But slight, demonstrably slight, as was the

impression made by foreigners on the Greek vocabulary, it was no deeper on the Greek manners. They might plant the olive on the soil of Attica, but assuredly they did not imitate her previous inhabitants in agriculture; they might extend the catalogue of gods and goddesses, but they did not teach the morality of marriage or the worship of a deity.

Geology of the Roman Catacombs.

The catacombs, vast as they were, and found in greater or less numbers, in greater extent and depth, on almost every side of Rome, were directed, limited, necessarily self-adapted to the conformation of the land and to the geological strata, some of which received them with welcome and security, others inhospitably repelled them, being altogether unfit for such use. Without going deep into the geological formation of the basin of the Tiber, in which lies Rome with her seven hills, and amid the adjacent valleys and heights, there are mainly three kinds of deposit left by the successive changes in the geology of the region. These are the *tufa litoide*, the *tufa granulare* and the *tufa friabile*. From the first of these came probably much of the stone used when Augustus transformed the city of brick to what his flatterers called a city of marble; from the latter the pozzuolana and the sand used for building and for other ordinary industrial purposes. Of these the first was too hard; it would have been enormously costly to hew it out into the spacious and intricate necropolis, which must be perpetually enlarging its dimensions to receive the remains of the growing and multiplying Christian population. The latter was far too loose and crumbling for the purpose of secure and lasting burial. But the second, the *tufa granulare*, formed chiefly of volcanic deposits, was not too hard to be worked, yet was solid enough to make walls for long and intricate passages or ambulacra, to be hewn into arches, vaulting over deep recesses in which the coffins were arranged, and to support floor below floor—two, three, four, five—down to the utmost depth at which the formation was found. But, of course, when these formations so suited for them ceased the catacomb stopped; the passage died away (this is De Rossi's expression) against the hard rock or as it approached the crumbling pozzuolana. The catacomb must also maintain itself at a certain height. If it descended towards the valley of the Tiber, the course of the Anio, or even of smaller streams like the Almone, it would be liable to be flooded, or at least suffer from the filtration of water, dangerous, if not to its security, yet to its decent propriety. In parts it might expand into a more spacious area, where, we know not how early, might be the lowly chapel, and in times of persecution the place of refuge from cruel death.

Prehistoric Dwellings in Scotland.

It is curious to think that, during the deposition of the prehistoric formations, Scotland was a forest, and that where now is mile after mile of moss and blackness there flourished oaks, and that among these lived numerous wolves, wild boars and savage bulls. To secure himself from these enemies, even if he had none such in his brother man, the aboriginal Caledonian required a dwelling, and even in the Stone period he contrived to have some such protection. The dwellings of the men of this state were like those of the badgers, and indeed like those of certain natives of Siberia at this day—underground. Dr. Wilson has collected curious instances of such. They are, he tells us, almost uniformly found in groups—a striking instance of the propensity of mankind to sympathise with each other. The rudest of them are merely excavations in the ground, and do not appear to have been longer than 8 feet, and not even stones were employed to make them more substantial. Stones, however, were often employed in constructing them. "The Aberdeenshire caverns," writes Wilson, "are constructed of huge masses of granite, frequently above 6 feet in length, and though by no means uniform either in internal shape or dimensions, a general style of construction prevails throughout the whole. Some of them have been found upwards of 30 feet long and from 8 to 9 feet wide. The walls are made to converge towards the top, and the whole is roofed in by means of the primitive substitute for the arch, which characterises the cyclopean structures of infant Greece, and the vast temples and palaces of Athens and Yucatan. The huge stones overlap each other in succession until the intervening space is sufficiently reduced to admit of the vault being completed by a single block extending from side to side. They have not unfrequently smaller chambers attached to them, generally approached by passages not above 3 feet in height, and it affords a curious evidence of the want of efficient tools in the builders of those subterranean structures that, when these side apartments are only separated from the main chamber by the thickness of the wall, the stones, though placed flush with the walls of the latter, project irregularly into the small cells, giving them a singularly unshapely and ragged appearance." These subterranean dwellings are very common in Scotland, and there is scarcely a moor perhaps in which if sought for, they may not be found.

NOTES AND COMMENTS.

It would be strange if American smartness did not gain approval in the law courts of the States, and against such an opponent as the terrible Customs Department. One lengthened case where it has triumphed has been recently concluded. The contractor for a court-house in Boston perceived that while there was an oppressive duty on wrought-iron beams, iron structures were treated more equitably. He therefore decided that his beams and joists should be temporarily united and imported as an iron structure. The Customs officer would not allow of imports to be interpreted in that manner, and insisted on levying duty on each beam. The money was paid under protest, and an action was afterwards taken to recover it. The Customs Department opposed on technical grounds, but the Courts have decided that the conduct of the contractor was entirely legal, and he is entitled to recover the money. That is a satisfactory conclusion, but we hope its importance is not diminished, as would be the case in England, by the drawback that the lawyer's fees are far in excess of the saving attained by the contractor.

THE students of the Ecole des Beaux-Arts, Paris, are about to petition the French Chambers in order to obtain some mitigation of the law of conscription, which oppresses them to an extent which was not contemplated in 1889. It was then decreed that in time of peace after a year's service, and on demand, certain classes of recruits could be exempted from further service. Among them were teachers who had signed a ten years' engagement, students of law and medicine, and others who sought after specified diplomas in the schools of arts and manufactures, or the superior commercial schools. The privilege was also given to those who were to compete for the Prix de Rome or one of the national medals in the Ecole des Beaux-Arts, and the Ecole Nationale des Arts Décoratifs. But the prizes sought by those artists are open only to a few men, while it is not difficult to obtain the certificate conferring exemption in law, pharmacy, instruction and commerce. Art workmen need only devote a year to arms, but the artists who direct them must either contend for one of the great prizes or serve like ordinary Frenchmen. The architects are especial sufferers, for only a minority aspire to a Prix de Rome. All that is sought is that young artists should enjoy similar privileges to the other professional classes, and from which they are excluded by an excess of precision in drawing up the regulations for recruiting the army.

THE majority of Frenchmen would have preferred to see that joyous veteran ARSÈNE HOUSSAYE elected to a chair in the Academy instead of his son. But as Academicians go there is no doubt that M. HENRY HOUSSAYE is more than competent. Father and son have been associated with *L'Artiste*. The latter is, however, more of a Néo-Grec. In 1868, when he was a youth of nineteen, he published his book, "Apelles et la Peinture Grecque," which is remarkable for its learning, and his essay on the antique subjects in that year's Salon was an innovation. The next year he issued a pamphlet about an antique vase in the Barbakion Museum, Athens. When the war broke out M. HENRY HOUSSAYE took his position as an officer of Mobiles, and his bravery at Champigny won for him admission to the Legion of Honour. In 1874 he gained the Prix Thiers for his two volumes on "The History of ALKIBIADES and the Athenian Republic from the death of PERICLES to the appearance of the Thirty Tyrants." He contributed many articles on art to French journals. M. HENRY HOUSSAYE wrote a volume on the siege of Paris in 52 B.C., besides others on the cities of Athens, Rome and Paris; ancient and modern art, the population of Athens in the fifth century B.C., and especially two which appeal to Frenchmen, 1814-1815. In all these works there is a seriousness which is a contrast to the paternal style, but they are credentials which augur well for the success of the latest Academician.

THE LATE HERBERT AUGUSTUS KEATE GRIBBLE.

[BY A CORRESPONDENT.]

IT is with deep regret that we have to announce the death of Mr. Herbert Gribble, on Saturday last, at his residence, 64 Redcliffe Road, South Kensington, in his forty-eighth year. Most of our readers must know and fully appreciate his great artistic talent, and the whole profession will mourn for the loss of one of its brightest ornaments. To those who enjoyed his personal acquaintance the loss will be more deeply felt, as he was a true and sincere friend, of a most kindly disposition, and notwithstanding his great and exceptional abilities was ever modest and humble minded; indeed, his love and trust in his fellow men was like that of a child. The world is apt to take men at their own valuation, and it is probably owing to this fact that Mr. Gribble, with all his brilliant skill as an artist and designer, never reaped, as he should have done if the public had been able to appreciate true genius, that prominent position he so well deserved. In thinking of him now that he is taken from us, we are reminded of others, such as Street, Burges and Godwin, and it is with such men alone that we can compare him. Like them, he had his many disappointments and grief at unfair treatment, yet he was never one to complain. He bore his disappointments manfully, and had never an unkind word for anybody, however hurt he might feel.

A few particulars of his life may be of interest. Mr. Gribble was born at Plymouth in 1847. At the age of sixteen he was articled to Mr. Norman, of Devonport, and in his twentieth year came to London and attended the South Kensington schools, where he gained numerous medals and other prizes, and a scholarship, taking the national medallion in 1864 and 1865; the first being for his design for a cathedral, a really masterly work, at the early age of seventeen years. About the year 1867 he entered the office of Mr. Joseph Hansom, where he served as principal assistant for about ten years. He was extremely clever as a painter, and one of his earliest works, an interior view of the FitzAlan sanctuary at Arundel, the first he ever exhibited, was hung "on the line" at the Academy, and was purchased by the Duke of Norfolk.

After being with Mr. Hansom for many years, he commenced practice for himself, and designed the laying out of the West Hoe Estate, Plymouth. He competed for the memorial to General Grant, in New York, being, we believe, the only Englishman who did so, and was awarded the second prize. In his native town of Plymouth there are many evidences of his skill and ability, notably an extremely quaint and picturesque group of artisans' dwellings and shops, and very extensive show-rooms, offices and warehouses for the well-known marble merchants, Messrs. J. & E. Goad. To these must be added a still more worthy monument of his ability, viz. the Armada Memorial, which he obtained in competition.

His design for St. Philip's Church, Spanish Place, although not selected in the competition, was considered by many ecclesiastical architects to be the best of those submitted; but whatever differences of opinion may exist on this point, all must admit that it was a grand conception.

A less known but yet a very beautiful little work is his convent chapel at Harley House, Portland Road.

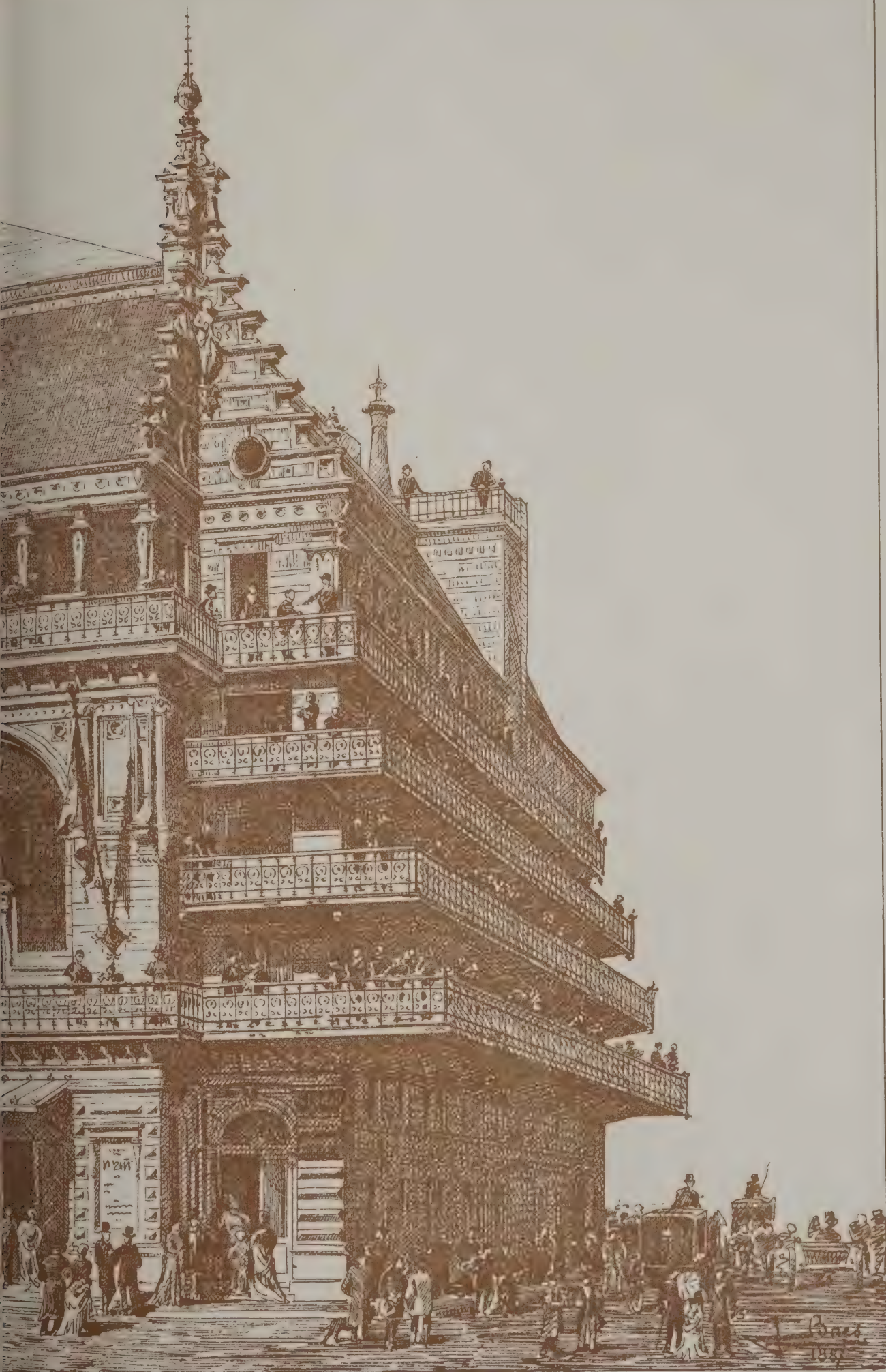
It may not be generally known that Mr. Gribble, like a true architect should, possessed a considerable engineering knowledge, and even in his early life took several prizes for his drawings of machinery and for construction. One of his latest works, as yet, we believe, unfinished, was his church of the Holy Name, at Poona, India. We hope shortly to publish some of his masterly sketches for this.

His great work, the church of St. Philip Neri, better known as the Brompton Oratory, will always stand out pre-eminently as his monument, and a more fitting one for a sincere and devout Catholic it would be hard to find. Every detail in it was drawn by his own hand, and every stroke made was done with a keen love of the work. It is much to be hoped that the completion of this noble and costly pile will be made in accordance with the designs he prepared with such loving care. It may almost be said that he gave his life up for this work.

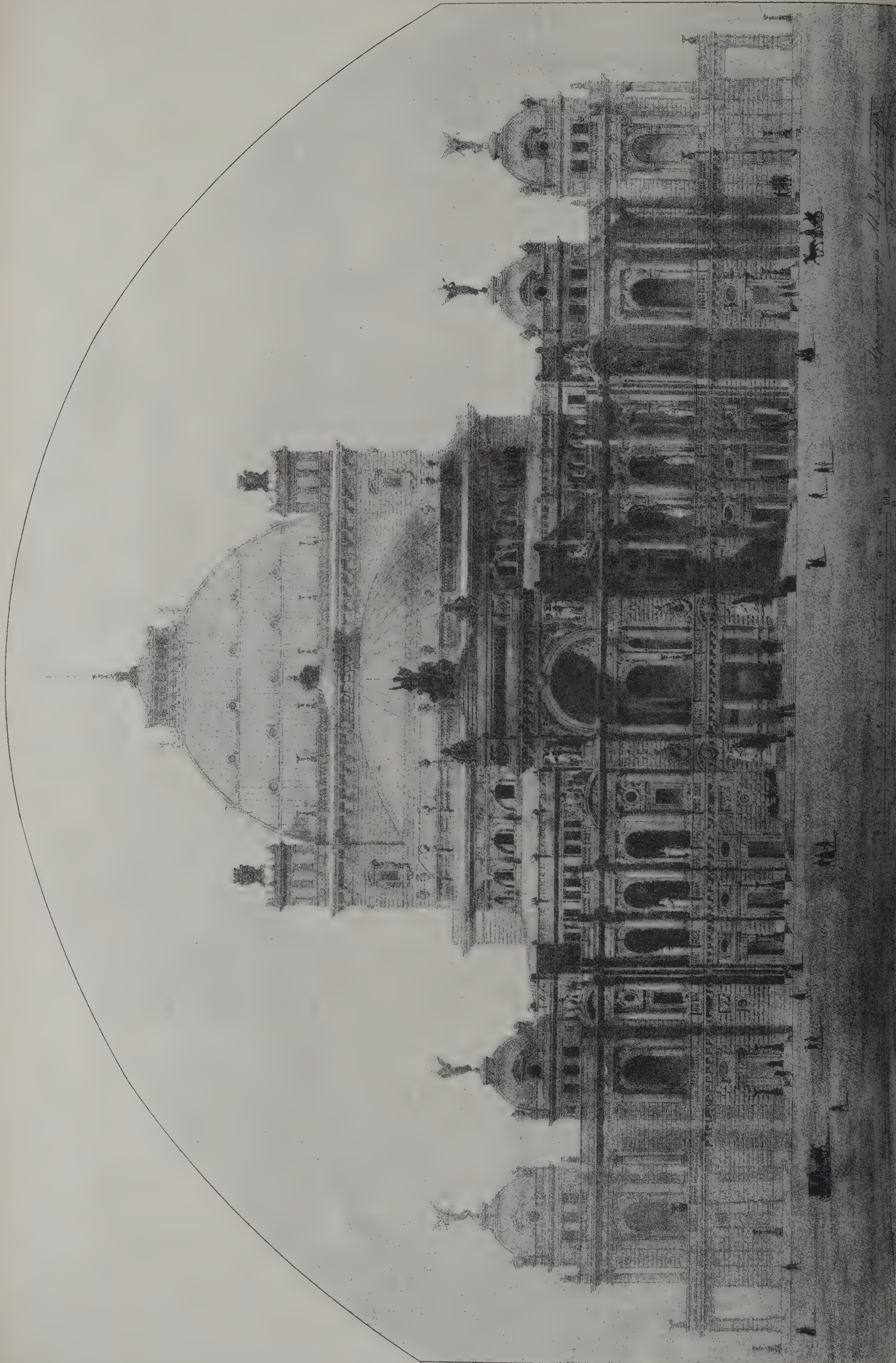
As a fitting mark of appreciation of his great genius his body was brought to this grand church on Thursday last, when a requiem mass was sung with all the solemnity and dignity pertaining to ritual of the Communion to which he belonged, previous to its interment in the cemetery of his parish church, that of St. Thomas à Becket at Fulham.

According to the *American Architect*, Messrs. George Ashdown Audsley and William J. Audsley, architects, have brought suit in the United States Circuit Court against the City of New York, claiming 120,000 dols. for "services in designing, furnishing and delivering plans for a contemplated new municipal building." This is the first suit brought by architects in consequence of the abandonment of the scheme for which competitive designs were invited some eighteen months ago, but it is said that other similar ones will probably be brought.









St. Peter's Basilica, Rome

OUR ST. PETERS BOURNE

DE CHAUSSEE

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101 par Victor Schröter. Professeur
à la Direction d'Études Supérieures

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 264. Vorsteher d. Loge
 265. Aufseher
 266. Kellner
 267. P. p. p.
 268. Schlichter
 269. Bediente
 270. Vorsteher d. Loge
 271. Aufseher
 272. Kellner
 273. P. p. p.
 274. Schlichter
 275. Bediente
 276. Vorsteher d. Loge
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 281. Bediente
 282. Vorsteher d. Loge
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 291. P. p. p.
 292. Schlichter
 293. Bediente
 294. Vorsteher d. Loge
 295. Aufseher
 296. Kellner
 297. P. p. p.
 298. Schlichter
 299. Bediente
 300. Vorsteher d. Loge
 301. Aufseher
 302. Kellner
 303. P. p. p.
 304. Schlichter
 305. Bediente
 306. Vorsteher d. Loge
 307. Aufseher
 308. Kellner
 309. P. p. p.
 310. Schlichter
 311. Bediente
 312. Vorsteher d. Loge
 313. Aufseher
 314. Kellner
 315. P. p. p.
 316. Schlichter
 317. Bediente
 318. Vorsteher d. Loge
 319. Aufseher
 320. Kellner
 321. P. p. p.
 322. Schlichter

- 21 Für Diener
22 Kleider-
abfänger
23 Reliquien
24 Hammer-
und Hieslau-
rath
25 Logengang
26 Singänge
zum Saal
27 Zuschauer

28. Juncus n. Sonth.
29. Juncus n. Leger.
30. Juncus n. Trepp.
31. Juncus n. Trepp.
32. Juncus n. Trepp.
33. Juncus n. Trepp.
34. Juncus n. Trepp.
35. Juncus n. Trepp.
36. Juncus n. Trepp.

37. Gerstengraß
 38. Weizen
 39. Buchweizen

- [illegible]

- 40 Perücken.
 48 ~~Perücken~~
 50 Doppel für
 Conzen und Prosperi. 54 Acquisition von
 Hofe de Berlin zu St. Maurice. De. Compri

Seelitz. v. Professor Victor Schröder.

INK-PHOTO. SPRAGUE & CO 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

PROPOSED NEW OPERA HOUSE, ST. PETERSBURG.

Professor V. SCHRÖTER, Architect.



INK PHOTO SPHAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.

A DOORWAY BY GRINLING GIBBONS

Drawn by ARTHUR H. BELCHER.

ILLUSTRATIONS.

PROPOSED NEW OPERA HOUSE, ST. PETERSBURG.

FLEMISH THEATRE, BRUSSELS.

NEW ZEALAND FREEZING STORE, IMPERIAL INSTITUTE.

THE Frozen Meat Kiosk is erected in the gardens of the Imperial Institute for the New Zealand Government, the materials used being red brick for the base, the half timber work is of oak filled in between with plaster, and the roof is covered with Broseley tiles. The floor is laid with Roman marble mosaic. The freezing apparatus was supplied and fixed by Mr. LOUIS STERNE, C.E., of 28 Victoria Street, S.W. The contractors were Messrs. MOWLEM & Co., and Mr. F. H. TULLOCH, A.R.I.B.A., is the architect.

A DOORWAY BY GRINLING GIBBONS.

THIS plate is taken from a drawing by Mr. A. H. BELCHER exhibited in the Royal Academy.

THE ARCHITECTURAL ASSOCIATION.

THE usual ordinary meeting of the Association was held on Friday evening, Mr. E. W. Mountford, president, in the chair. Mr. Edwin O. Sachs read the following paper, entitled

The Modern Theatre of the Continent.

Mr. SACHS said:—The last meeting of the Association at which attention was given to theatre construction was held in March 1892, when Mr. Woodrow ably discoursed on the modern development of theatre planning, and in the limited time at his disposal fully described the essential features of modern theatre construction. His paper, however, principally treated of the requirements of a London theatre, and the valuable drawings he collected for the occasion chiefly illustrated the latest examples of theatre planning to be found in our Metropolis. Now all our theatres have, so far, been the outcome of private enterprise, and there is no such thing in England as a national or municipal play-house, or even a private theatre which receives a subsidy from a public authority. Mr. Woodrow, hence, principally treated of buildings which are erected by private individuals as an enterprise based entirely on commercial lines, and where the question of £ s. d. practically stands first both for the promoters and the architect.

This paper will chiefly treat of buildings where the financial aspect, as a rule, only plays a minor part for all concerned. The theatre of the Continent is mostly a public building, in the full sense of the expression, and the play-house run as an investment, or rather as a speculation, is the exception. The theatre plays an all important rôle in the life of the localities, as the inhabitant is almost everywhere an enthusiastic theatre lover, no matter what his social standing may be. The money necessary for the institution is generally comparatively easily found, as I shall directly explain, and I would even go so far as to say that the continental theatre is the one building where a heavy list of extras above the estimated cost of the work is almost accepted as a matter of course, and met without prejudice. To quote a notable example at once. Take the Halle Theatre on these walls. The competitive conditions required a building for 21,000*l.*, the architect's estimate on receiving the commission figured 25,000*l.*, and the actual cost was 59,000*l.* Mr. Seeling, of Berlin, is the happy architect.

When I answered your honorary secretary's invitation to read this paper I had hoped to be able to treat of the modern theatre of every part of the Continent, or rather of every continental country. When I started my preparations for this evening I soon found that the field was such an extensive one that some limitation would have to be made if I wished to avoid giving you vague generalities only. I decided to risk complaints that the title of the paper promised more than it contained and to limit myself to half a continent. I must now claim your indulgence on this point, remarking at the same time that I have at any rate selected the continental countries for to-night which contain the more interesting examples of modern theatre building from an architectural point of view, and which, if I may say so, show the greatest progress in theatre planning of any part of the world during the last ten years. Northern and Central Europe will be my field to-night, or perhaps, to be more explicit, the countries in which theatre matters are treated on German lines. The Austrian empire, the German empire, the Netherlands, Denmark and Scandinavia are the countries, and the term "modern" is to cover the last twenty years. I propose, however, just touching at times on the other countries where theatre matters are managed on what I shall term Italian lines, if only to avoid giving you the

impression that I do not think there is anything new to learn there.

A paper of this kind is of course almost entirely dependent upon illustrations as far as practical information is concerned. Put up a poster here with a few short facts and inscriptions in bold type and the drawings alone will tell us nearly everything we want to know as architects. I say nearly everything. The circumstances under which the buildings are erected and their object cannot well be explained on posters. A paper, however short, would have to supply the missing particulars. That this room is so well papered to-night and can afford an opportunity for study, is mainly due to the great courtesy of the architects of the theatres in question or their employers. It is true that the originals you see were not specially sent over for this meeting, nor the many tracings specially prepared for the occasion. The latter are simply from a collection I have been making for a different purpose. The fact, however, remains, that if it had not been for the kindness of our foreign friends the principal feature of this evening would have been missing and my paper almost an impossibility. I would specially mention that it was due to the Court Office of Works and Messrs. Gruber and Hofer that we have here the late Baron von Hasenauer's new Hofburg Theatre. We are indebted to Mr. Manfred Semper for the illustrations of Gottfried Semper's Dresden Opera House, and we have to thank the Theatre Administration at Buda-Pesth for the drawings of the late Von Ibyl's Hungarian Opera House. As most of you will know, Baron Hasenauer, Gottfried Semper and Ibyl were foreign correspondents of the Royal Institute of British Architects. It is due to the great courtesy of the Czar's Theatre Administration, at the instance of their much respected architect-in-chief, Professor Von Schroeter, that I can show you tracings from the design of the proposed new Opera House at St. Petersburg. Fairly complete sets of tracings from the following theatres are also exhibited, and in reading the list I will add the names of the architects and the date of their completion:—

Amsterdam Municipal Theatre	...	Springer	...	1894
Berlin "Lessing" Theatre	...	Von der Hude	...	1888
Berlin "New" Theatre	...	Seeling	...	1893
Brussels "Flemish" Theatre	...	Baes	...	—
Halle Municipal Theatre	...	Seeling	...	1886
Laibach Municipal Theatre	...	Hrásky	...	1893
Rotterdam Subscription Theatre	...	Verheul	...	1887
Schwerin Court Theatre	...	Daniel	...	—
Stockholm National Opera House	...	Anderberg	...	(1895)
Worms "People's" Theatre	...	March	...	1890

The drawings of these theatres, gentlemen, are in various scales, and the sheets having been somewhat indiscriminately hung, I am afraid they scarcely give you a good idea of the relative sizes of the different buildings. This sheet above you, sir, has been specially prepared to facilitate an appreciation of the dimensions. We all know the late Royal English Opera House, the Palace Theatre of Varieties of to-day. Here is the block-plan, coloured red, and there are the blocks of the most important modern theatres of the Continent, all drawn one five-hundredth full size, or to a scale very near to our one-fortieth of an inch to a foot. I have supplemented the sheet as you see with another, showing our old Drury Lane and Covent Garden Theatres, drawn to the same scale, together with a number of London's latest playhouses. The difference in the superficial area of the various structures is somewhat striking, especially if we refer to this plan of the Paris Opera House, and see how many London theatres we can stow away in its different parts. You see the English Opera House complete fits well on to the stage, our Court Theatre just goes into the auditorium, and Terry's Theatre into the grand staircase. It would be quite easy, as you see, to show the Parisians or the Russians the "Lights of London" with full-size Adelphi and Vaudeville façades on their Grand Opera House boards.

CLASSES OF THEATRES.

Now, gentlemen, it is quite common to hear the greater size and the elaboration of the continental theatre to be simply ascribed to the advantage of "State aid." In reality "State aid," as we understand it, is by no means the important factor it is represented to be over here. The number of national or government theatres abroad is comparatively very small. The majority of the theatres are the outcome of municipal efforts, the results of voluntary subscriptions and guarantee funds, or the liberality of royalty. Continental playhouses can be classified as follows:—

- I. Court theatres.
- II. National and government theatres.
- III. Municipal or district theatres.
- IV. Subscription theatres, with or without court, government or municipal subsidy.
- V. Private theatres, with or without court, government or municipal subsidy.

The private theatre alone is intended to be a money-making concern, which will amuse or educate its patrons according to the local requirements. The others are built without any mercenary motives, either :—

1. For the satisfaction of luxury;
2. For educational purposes;
3. For recreative purposes;

or for a realisation of any two of these intentions, and even all three in exceptional cases.

Court Theatres.

The court theatres are essentially the luxury of royalty, originated and kept up at their expense. The enjoyment of the entertainment given at these playhouses is, however, now mostly open to all comers on a payment for admission. The payments go towards defraying the costs of the management, and it rests entirely with the royal owners to what extent the public is allowed to avail itself of the opportunity of entertainment and at what figure. The public visit the playhouse on sufferance, to enjoy the exhibition at a smaller outlay than would be their lot if the institution were run on commercial lines. The audience is, to a certain extent, the guest of the royal owners. The court officials, &c., and all officers of the army and navy are generally on the free list of the court theatre, and university professors and other lights of learning frequently only have a nominal fee of entrance to pay. Art is encouraged on the stage, and the attendance of the cultured courted in the auditorium. As the admittance charged to those who do not enjoy the privileges is, comparatively speaking, expensive, the audience in all parts of the house is generally of a fair social status. An exception is only made on rare occasions of national festivity, when the auditorium is thrown open to all comers free of charge. Patriotic plays are then mostly performed, and the holiday-maker takes his seat in the stalls or gallery according to the rule of "First come, first served." It would be well, perhaps, to at once notice what pride most courts take in their theatres, and that the royal owners frequently use them for the entertainment of guests, public receptions, &c. No series of court ceremonies abroad is complete without a visit to the court playhouse, and it is not unusual for all the seats to be filled by special invitation only, the gathering ranking as a court function, not dissimilar to our annual State concerts at Buckingham Palace.

Government Theatres.

The national or government theatre is as a rule run on the same lines as the court establishments, with the exception that the foundation and maintenance of the institution is officially held out to be chiefly in the interests of art and education, whilst the court playhouse is generally boldly recognised as the outcome of luxury. The perquisites of officialdom in the shape of free tickets, the facilities afforded to the learned, and the high prices of the seats for the unfavoured generally, again make the auditorium the rendezvous of the cultured and moneyed. The nation, as such, undertakes to pay all expenses, but by dint of good management the admission fees not unfrequently substantially reduce the burden of the government exchequer. The national theatre in a way stands on a par with the national museum or picture-gallery, with the two exceptions that there is generally less to learn at the former and admission to all comers is far easier at the latter. The doors of the theatre, it is true, may be thrown open to all on special occasions, but unfortunately the percentage of the population that can avail itself of this permission is small indeed. The national theatre, which is kept up out of the country's taxes, is practically reserved for the office-holders, the *savants* and the moneyed, the latter again enjoying the entertainment at a lesser cost than would be the case if they visited an establishment run on money-making lines. It is doubtful if really much is done at the government institutions for art and education, and if the little really accomplished is beneficial or the reverse. The Paris Opera House, for instance, gives one of the worst performances it has been my lot to see. Politics are not unknown on the government stage, and party opinion has influenced the selection of many a play, its representation, and even its caste. One thing we should, however, remember, and that is the position the government theatres occupy as the show-places of the nations that have built them. In the same way as the court theatres, though perhaps not to the same extent, the government, royalty, or the officers of State, as the case may be, avail themselves of these institutions for hospitality and ceremonial.

Municipal Theatres.

The municipal theatre is generally intended for educational and recreative purposes; all classes are free to enjoy the entertainment at a minimum cost, and outside the actual outlay for the building, the ratepayers, as a rule, only have to make up the small difference between the actual expenditure and the amount of admission money received. This difference, of course, varies according to the success of the pieces. There

are no profits to make, no great risks to cover, and the inhabitants hence have their entertainment at cost price. Of course there are endless variations in the management of a municipal theatre. The favourite way latterly has been to put the building and fittings, which have been paid for out of the rates, at the disposal of a good manager, and to allow him a small subsidy conditionally that a fixed approved scale of admission and booking charges is not exceeded. Would-be lessees compete for the post, stating to what extent they require to be subsidised. Great care is taken to fill the office with a good man, whose substantiality is also unquestionable, and there are generally severe conditions as to the class of performance, the number of novelties to be produced annually, and the condition in which the building is to be kept. A heavy surety has to be found by the lessee to cover all eventualities. Contracts between the manager and the municipality generally date for a number of years at a time, and when a new lessee is once engaged, matters as a rule run very smoothly. As the great ambition of the municipality is to give its ratepayers good performances at a minimum cost, free lists, which would cost the management so many valuable seats, are not allowed, and at the most we hear of a reduced price in certain parts of the auditorium for students, and the customary special privileges which are allowed to army officers in most military States. You will be pleased to hear that the heading "students" covers the juniors in the architectural profession if they happen to attend a technical college or academy. The architectural student, like his university fellow, classes abroad as a cultured but generally impecunious individual. In exceptional cases the municipal theatre is considered in the light of a reception hall, where the authorities entertain distinguished guests, and the prominent inhabitants pay their visitors the compliment of attending in their best. Then it should always be remembered that the theatre is a recognised regular rendezvous for the different social sets of the community. Families of all grades have their particular evenings for the play. In the stalls different cliques meet periodically, say weekly, and likewise in the galleries, say monthly. On one night you may be sure of meeting a rich banker set in the best part of the house, and plumber Jones and his friends are sure to be on the cheaper seats. The next night it may be the army officers' clique in the best seats, and a certain railway signalman and his party will also be found in the auditorium. The municipal theatre is a public assembly hall in the fullest sense of the word.

Subscription Theatres.

The subscription theatre is run on lines similar to the municipal institution, with the great difference that its existence is primarily due to a desire on the part of the cultured and moneyed to satisfy their desire for the luxury of a good play. Education and healthy recreation are no doubt encouraged almost to the same extent as at the municipal establishment, and they serve as the official *raison d'être*; but for all that, the initial expense is incurred by the moneyed for their own private ends, though their contributions may certainly also be partly considered as a gift to their locality. The subscribers who build the theatre frequently reserve to themselves the privilege of selecting seats, but otherwise their share in the enterprise generally gives them no distinction. They, in fact, probably have to guarantee to cover any losses if they manage the place themselves, or if they have a lessee in our sense, may be required to promise him an annual subsidy or box rental. Subscription theatres but seldom receive assistance from government or court exchequers, though there have been one or two notable cases in Austria. The municipality, however, generally gives substantial help, partly perhaps in the form of a good site, and partly perhaps in form of a subsidy to cover the expenses of keeping the building in general repair. The erection of a subscription theatre, it should be remembered, generally lets off the municipality very cheaply, as an outcry for a new playhouse would always have to be satisfied sooner or later, and were it not for the voluntary helpers, this would be at the entire cost of the ratepayers. The perquisite system is of course again barred, though the student and officer may again have some special reductions. Subscription theatres have again originated through a nationality or coterie clubbing together with some particular purpose in view. Imagine, for instance, Scotchmen in London combining to have a Caledonian comic opera for the advancement of their national humour. Well, this essentially Scotch institution would only be open to the naturally humorous Irishman, for whom the building is of course not intended, on heavy extra payment, whilst all the men of Brae would enjoy their evening very cheaply. Theatres abroad have also been built in this way in combination with club premises, the whole block being the rendezvous of the nationality or clique in question, and at the same time the show-place where their particular fêtes are held. The latest outcome of the subscription theatre is the one which is built and run essentially on philanthropic lines for the education and recreation of the working classes.

I shall refer to this class of establishment at the end of this paper.

Private Theatres.

The private theatre abroad is managed on precisely the same principles as our own. In exceptional cases private theatres receive subsidies from the Government or municipalities to facilitate the production of new plays, subject to conditions as to the charges of admission, but these cases are very rare indeed. Subsidies by political parties for the furtherance of their interests are, however, not quite so uncommon. This I lodge, by-the-by, gentlemen, I should recommend to some of our political agents who have such difficulty in escaping the clutches of the law. The unsubsidised private theatre is, as a rule, to be found only in large cities where there is plenty of room for such enterprises beside the official institutions. The managers, however, have to take care that their buildings do not contrast too greatly with those of the privileged establishments; and the result of this competition, I would remark, is not only that the standard of their performance is very high, but that the comfort of the audience receives more attention than is customary in this country.

Now, gentlemen, I may seem to be taking up too much time with indications as to the various purposes of the foreign playhouse and the many methods of financing these institutions, but the particulars will, I hope, facilitate your appreciation of the circumstances under which our foreign confrères work and help explain his drawings as intended. In these days, when the pros and cons of giving some of our towns municipal theatres are really being seriously discussed, I also hold that some knowledge of the actual circumstances of the foreign institutions may be found useful by the members of this Association as ratepayers and advisers. Englishmen, we all know, are gradually becoming inveterate theatre-goers, and though the municipal stage may yet be far distant, I see no reason why the subscription theatre, and perhaps more especially the people's theatre, should not reach our shores in the near future.

Well, gentlemen, you will have observed I have so far avoided all allusion to the kind of entertainment provided in the continental building.

CLASSES OF ENTERTAINMENT.

As the architect's plan of course entirely depends on the performance to be produced, I must now add the missing particulars. In the first place, let me point out that the home of the variety entertainment will not be under consideration to-night, though some reference might have been quite *à propos* to the great storm in a teacup which lately raged about our Empire Theatre. I can only deal to-night with the home of opera and drama. Operas are but seldom found in private institutions abroad. At the most we hear of a private *opéra comique*. The private theatre is practically always the home of the different kinds of drama. Most of the government and court theatres only bring out operas, and are *bona fide* opera houses, and there are also a few municipal and subscription establishments that can also boast of this much-coveted name. There are a number of municipal and subscription theatres which are the home of drama in its many forms, and there are some rare examples of government and court institutions entirely devoted to this art. As a rule, municipal and subscription theatres, and to a certain extent the theatres of the minor German courts, are built both for opera and dramatic performances, which alternate nightly or weekly as the case may be. The successful planning of these houses depends almost entirely on the clever adaption of both stage and auditorium to this double purpose—a difficult task indeed, as the requirements for the successful production of a comedy or tragedy are so very different from the essentials of a grand opera. To enjoy a drama the audience must literally be with the actors, every gesture should be seen and every whisper heard. The actors do not require much space; in fact, their surroundings should be on such a scale that there is no fear of their appearing lost on the stage. At the opera the effect depends more on the *tout ensemble*; the gesture and intonation of the individual actor are not all important to the general public of to-day. Room is wanted on the stage, ample space for elaborate scenery, choruses and ballets. While the proscenium opening of a modern dramatic stage should not exceed 30 feet, and the auditorium should not be larger than for 800, an opera-house proscenium opening can well measure 60 feet, and the auditorium hold 3,000. Anyone who visited the French plays at Drury Lane will remember how much of the beautiful acting was lost upon the majority of the audience, whilst the German opera could be fully appreciated in every part of the house.

The promoters of the court, municipal and subscription theatres are often prone to attempting extremes, and I have several times seen what I would term a chamber drama put on the same stage on which a grand opera was mounted the night before. The satisfactory makeshift is only possible where the promoters at once make up their minds for a compromise in their bills. Small operas, operettas and burlesques will suit the same house that was built for full drama. Why not cut out

the grand opera and the chamber play? With the aid of clever planning the audience may then fully appreciate the entertainments, while the most ingenious architect with all the assistance to be had from a movable proscenium or the American style of shutting off part of the auditorium would not be able to satisfy the different audiences. At least this has been so far everywhere the case. It is true I once heard of hydrogen being used to assist the wafting of a tragedy whisper far up into an opera house gallery, but this device was too expensive to allow of its general introduction.

There is one thing yet, gentlemen, that I would here wish to point out when speaking of the various classes of entertainment given, and that is the constant change of bill in all, or nearly all, continental theatres. The same play is but seldom given for two nights running. Excepting perhaps at a private theatre, once or twice a week would probably be the most. This necessitates a much more roomy stage than for theatres where the same piece is given night after night, and this again quite independent of the storage accommodation, which may or may not have to be provided under the same roof. Where things are not put into the same place night after night there must be ample room for moving about and plenty of space for the reserve; actors, managers, engineers and the lighting department all want more accommodation.

Now, gentlemen, ends what I will term my intended indication of the circumstances under which the modern theatre of Northern and Central Europe is erected. I know I have been very lengthy, but I trust, as I have said before, that besides assisting your appreciation of the drawings these particulars may one day come in handy to you, when the promotion of public theatres really stands on the same ground as the free library movement of to-day.

To attempt a description of the buildings which are illustrated on these walls, to try to describe the requirements which had to be fulfilled in the individual theatres or even classes of theatres, would, I am afraid, lead too far. I must limit myself to pointing out some of the more important features of the continental theatre, and at the most can preface this with an allusion to the spirit in which the foreign architect is expected to do his work. Here I must, however, again crave your indulgence. I shall actually venture to make some laudatory comments on the architecture shown in the modern continental theatre, and that in a room where sweeping condemnation and pessimism for everything the modern architect does seems unfortunately to be lately considered attractive. Of course I principally refer to Mr. Beresford Pite's teachings. One of the last results of his interesting philosophical analysis of modern architecture was, it will be remembered, at the meeting before last, when he considered the Paris Opera House was an abortion. Well, Mr. Chairman, I believe I am quite in order if I here take the opportunity of protesting against a sweeping condemnation of this kind.

(To be continued.)

RHIND LECTURES IN ARCHÆOLOGY.

A SERIES of lectures has been opened by Dr. Christison, secretary of the Society of Antiquaries of Scotland, Rhind Lecturer for the current year, who has chosen for his subject "The Early Fortifications of Scotland."

In the first lecture he dealt specially with mottes. To begin with, however, he noted the neglect with which the subject of early Scottish fortifications had been treated by archaeologists, the chief cause of this apathy being the strong classical bent of the archaeologists of the day, who despised all field works that could not be ascribed to the Romans. In our own day the cause of neglect had been the supposed monotonous and uninteresting character of the remains, and so a subject which concerned some sixteen hundred structures had yet been but little studied in detail or systematically. Difficulties there were in the unreliable character of previous observations and in the ruinous and vague condition of the remains themselves, and excavation was still required to reveal the nature of the works, and little had yet been done in that way. When they considered the eagerness with which our countrymen had carried out excavations abroad, it was surprising that the buried forts and towns at home should be so much neglected. In dealing with the subject he had adopted the division into (1) mottes, (2) rectilinear works, and (3) curvilinear works. In treating of mottes it was necessary to get rid of the modern signification of mote as the ditch of a fortress. The mottes of which he was to speak were, in their simplest form, artificial flat-topped mounds, defended by palisades round the edge; and considering that these were the fortresses of England during the Saxon period, and that a large number still existed, they had attracted surprisingly little attention in modern English general literature—a state of oblivion which might be attributed to the revolution in the meaning of the word, the confusion of moot hills or meeting places, and the fact

that they were not contemporarily known as mottes. The most typical examples of the mote were to be found in France. There were contemporary notices of them; and from De Caumont we learned that they were the castles of France during the tenth and eleventh centuries, and that they consisted of a base court defended by a palisade, earthen rampart and trench, with a rounded eminence at one end or in the centre, artificial or natural, on which stood a citadel, in general of wood, but sometimes of stone. The characteristics of the English mottes were the same, the mound being sometimes partly or wholly natural. Of these fortresses fifty were mentioned in the Anglo-Saxon Chronicle, and about twenty-one still existed, the date of erection being known. But altogether 265 in England and eighteen on the Welsh Borders were mentioned by Mr. Clarke. They appeared to have flourished as early as the first half of the fifth century, but the first contemporary notice was by Bede, about 727. They appear to have been only gradually superseded by the Norman castles, and a wooden castle at Shrewsbury was mentioned as late as the reign of Edward I. While these were called mottes on the Continent, there was reason to believe that burh was the name by which they were known in England. Although 150 mottes were marked in the Ordnance map of Scotland, their existence had fallen into almost complete oblivion, and even antiquarian literature was almost silent on the subject. Not a single instance of the attack or defence of a mote in Scotland could be quoted, and history was equally silent as to the use of moot hills. But there was no lack of evidence to prove that the names were no mere modern invention. The number of mottes recorded in the Ordnance map was brought up by private research to 180. Of these, thirty-eight might be considered as quite satisfactorily made out, because they were conical flat-topped mounds, trenched and, in some cases, ramparted at the foot. Thirty-six others had the round mound only, the entrenchments, if they ever existed, having disappeared before agricultural extensions. Nineteen mote-like mounds, terraced or ramparted, or partly both, on the slope, but not fortified at the base, came next; and, lastly, there were six low mounds or circular level spaces, environed by a trench, generally on a low marshy plain, which might be included, as they were locally known as mottes. Thus about 100 of the mottes had some claim to the title. The distribution of the mottes showed that their great centre was Kirkcudbright, which contained seventy-six. From this centre they spread into Wigtown and Ayr. There were one or two in Renfrew, three or four in Lanark. Eastward, they were common enough in Nithsdale and Annandale, but beyond that there were but three or four in the most Saxon part of Scotland. There were fewer still north of the Forth. Their scarcity in Saxon Scotland, compared with Celtic Galloway, seemed very extraordinary. Possibly it indicated a strong Saxon occupation at one of the periods of invasion and conquest, brought to light by Skene; but it was strange that the name burh, supposed to have been applied to them in England, should have been supplanted by the name mote. As to the conclusion of the period of the Scottish mottes, all that could be said was they ceased to be used at the beginning of the fifteenth century, as they were used in charters of that and the following two centuries not as fortresses, but as subdivisions of land. The Scottish mottes were generally very small. The number of purely artificial mottes was also very small, and the variations from the original type were sometimes so extreme as to leave little difference between them and the ordinary hill fort.

In the second lecture Dr. Christison referred to "Rectilinear camps and Roman camps, stations and outposts." He at the outset expressed the deep gratitude that archaeology owed to General Roy, if it were only for his plans of important structures, some of which had been entirely obliterated since his day. These plans when tested by such of the so-called camps as survived seemed to be quite accurate, except in minor details. But the same faith could not be placed in the elaborate structure of conjecture and theory that he founded on his plans, any more than in the similar work of other early antiquaries, who, like him, were too apt to follow the dangerous method of hunting for and finding objects where they wished to find them, and who accepted as Roman every rectangular enclosure, simply because it was rectangular, without further question. When the subject was approached in this loose and unscientific manner it was no wonder that the map of Scotland became thickly dotted with Roman camps, so that no less an authority than Mr. Hill Burton asserted that there remained acknowledged as Roman a sufficient number of works to create a special topographical feature of the country, and that they were so numerous as to justify the belief that there were more known and recognised Roman camps in Scotland than in all the rest of the world. The time had come when the evidence on which this bold and startling statement rested should be sifted. Dr. Christison then indicated that it was particularly from a structural point of view that the question could be studied most hopefully, and the best mode of setting about it would seem to be to ascertain what

were the characteristics of proved Roman field works. It was on the Wall of Antonine that we stood on the surest, perhaps the only assured, Roman ground in Scotland. Yet even here the thoroughly Roman character of the work as it was left to us might be questioned. Taking responsible authority, we found marked on the Ordnance map, or given by General Roy and Mr. Vere Irving, a total of seventy-four military field works attributed to the Romans, without counting the great wall and its forts. The classes into which these might be divided were three. There were first large works with a single entrenchment. These exceeded 1,500 feet in length and were generally rectangular and rectilinear, but sometimes rhomboidal and with the sides slightly curved. Their claim rested mainly on the belief that every rectangular field work must be Roman, a claim that was finally disposed of when it was made known by General Pitt-Rivers that rectilinear forts existed in Ireland where the Romans never set foot. It was also claimed for most of these that they were temporary camps on the line of Agricola's armies, but as far as the lecturer's experience went, there was very little of that agreement in size and shape which ought to exist among them if they were the successive camps of an army on the march. The second class consisted of small rectangles with a single rampart and trench. Thirdly, there were rectangles with several parallel entrenchments. Well-ascertained examples of this class, all of them works of great strength, were Birrens, Dumfries; Lyne, Peebles; and in Perth the camps at Strageath Mains and Ardoch. The lecturer entered into a detailed description of Ardoch, and mentioned that it apparently differed from all the circular and oval forts he had examined in its trenches being entirely depressed below the original level of the ground, instead of their depth being partly due to the excavated earth thrown up in front or rear of the trenches. Ardoch was not the only rectangular work in which he had noticed this, and possibly it might prove to be a characteristic distinction of certain classes of the rectangular type. In respect of the use of flanking defences at the angles, Ardoch stood alone among Scottish forts as far as he knew. The lecturer then dealt with the remaining works ascribed to the Romans in Strathearn and the neighbourhood, all of which he investigated on the spot last summer. Having described a well-marked example of the small rectangular class near Ardargie Mains, he mentioned twelve other alleged Roman works in the district either not rectilinear or slightly so. All of them were marked in the Ordnance map, but he knew not on what authority. Their sites were Crieff Junction, Ogle Hill and Ben Effery, Cultoquhey, Kaims Castle, and the south edge of Tullibardine Moor, while five were on the line of the Roman road running south from Strageath. Lastly, there was the Roman Camp at Fendoch, Glenalmond. Of all these, he declared, five had nothing to distinguish them from ordinary native forts, two others were nondescript, but with not the slightest sign of Roman workmanship, and the claim of the remaining five, trifling mound-circles, 30 to 40 feet in diameter, rested apparently on their close proximity to a supposed Roman road. Discussing the evidence that the four camps of the Ardoch type are Roman, he pointed out that the most direct testimony we could expect would be the discovery of Roman remains within any of them. Author after author had positively asserted that the only inscribed Roman stone found north of the Forth was discovered in Ardoch, and that a number of Roman altars now in the National Museum of Antiquities were found in Birrens. But, unfortunately, when traced back to the original authorities the statements on these points were not so clear as could be wished. The whole evidence, he concluded, pointed to the Roman origin of the works of this class, but further investigation was necessary before it could be said with confidence that they were Roman. Finally, Dr. Christison discussed the import of "Chester" as a place name in Scotland, which, he said, had some bearing on the Roman question. It was natural to claim for the name "Chester" in Scotland a direct origin from the Romans, and it might be alleged in favour of this view that it was entirely confined to the parts of the country supposed to have been most firmly possessed by that people. But, on the other hand, he mentioned as objections which seemed to be fatal to this theory that the name was not found on the line of the Roman Wall, or at any of the so-called Roman camps and stations, or at any place where relics of the Romans had been found. He suggested that the natural origin of the name was from the Romanised Britons, who might be expected to continue the use, in some form or other, of the "castrum" employed by their Roman masters, and to have handed it on to the Saxons as the "cesters" or "caestres" which occurred so often in the early pages of their history. It was remarkable, however, that whenever Bede mentioned one of these "cesters," he took pains to explain that the name was English. Evidently, therefore, "cester" was thoroughly naturalised among the Saxons at a very early period, and there was no difficulty in understanding how the Saxons might have brought with them to Scotland a name for a city which was already so

familiar to them. But the real difficulty was to explain why, the English "Chesters" being all cities or places of importance, the Saxons, on entering Scotland, should apparently have conferred the name on a number of small and obscure forts not differing in site or structure from the numerous forts around them which were not called "Chesters." Certainly the present status of the "Chesters" in England and Scotland was very different, for while in the former many considerable towns bore the name, in the latter it was confined to mansions, farm-houses and old forts.

The special subject of the third lecture was curvilinear forts or forts proper—not including the brochs—of which there were, he said, some 1,100 examples. These were densely crowded in some parts of the country and thinly spread or absent in others. Between the Mull of Galloway and Greenock the number was only about fifty, but the remarkable point was that, with scarcely an exception, they were all within a few miles of the coast; and landward they were separated from other groups by a vast tract absolutely devoid of forts. But nowhere was the isolation of groups more remarkable than in the Highlands. On the mainland of Argyle and the neighbouring smaller islands, not only was the isolation from the rest of the Highlands very marked, but the distribution within itself was very peculiar. The total number of forts was no less than 176, but of these the northern part of the district had only three, and the district of Kintyre and running north from the Mull for ninety-five miles contained 143, all upon the coast or within a mile or two of it. In the Highland mainland, without Argyle, the forts were extremely few, occurring in remarkably isolated groups. The great elevation of the Scottish forts had been alleged as a reason why they were merely intended as temporary refuges; but even at the present day in the eastward parts of Europe, where life was insecure, the peasants retired at night to villages perched at great elevations above the fields which they cultivated during the day. As a rule, the builders of these forts sought for some natural strength of position, but not invariably, and a considerable number of sites were on low and level ground. Our detailed knowledge of the forts was insufficient to enable us to classify them systematically, but some eight species could be described. These were:—(1) Entrenched works, entirely of earth; (2) entrenchments with ramparts of earth, purposely mixed with stones; (3) forts with walls of loose heaped stones; (4) forts of dry masonry; (5) forts of dry masonry and timber; (6) forts with an inner wall of stone and outer defences; (7) terraced forts; and (8) vitrified forts. Of these the forts of dry masonry had been by much the largest class, especially in the Highlands, and it was there that they could study their structure with any satisfaction. There it was found that the walls consisted invariably of more or less well-built faces, with a core of rubble, the whole sometimes as much as 14 to 16 feet thick. Of the original height one could not speak, but 8 to 10 feet was the greatest remaining height. We were equally ignorant as to how the walls of the Scottish forts were finished at the top; but in Ireland, according to Dr. O'Donovan, the walls were carried up above the core so as to form parapets. In none of the Scottish walls had there been detected any sign of division into longitudinal compartments, but in the South Fort at Luign and elsewhere traces had been found of chambers in the thickness of the wall. The apparent total absence of port-holes or windows was another remarkable feature. As to the so-called vitrified forts, the precise nature and object of the vitrification was still a matter of dispute after nearly a century and a half of controversy. Was the vitrification structural and intentional or merely accidental? In discussing this question the lecturer examined the views of past authorities on the subject. Next he described the specimens which he had himself examined. Not less than fifty-five forts in Scotland had been described as vitrified; but even allowing that there was such a thing as a vitrified fort—that was to say, a fort purposely vitrified—very few of the pretenders could establish any claim to the distinction. From his first experiences he should have said none of them could, but the sight of Carradale, in Kintyre, had somewhat shaken his first opinion. Of the fifty-five, only twelve showed proof of considerable vitrification, and in these the vitrification was only partial. The vitrification was not founded on the ground, but rested on loose stones, and it was more perfect at the top and sides than in the centre. It was difficult to understand the object of vitrification, if it had any, and he could only suggest that it might have been to consolidate the top to give a firm footing to the defenders. As to the general plan of the forts, they were, where the site allowed, generally circular or oval in form, with variations to suit the nature of the ground. Many had but a single entrance, but two were common. In forts of the complex plan, generally of the earthen type, the entrance sometimes passed straight through two lines of defence, sometimes was zigzagged. Not infrequently it was retired, so as to give a flanking defence. Traces of traverses, so as to check the rush of an enemy, all round the enceinte had been seen in stone forts; and occasionally there were signs of

detached outworks. In every district he had visited structural remains had been observed in the interior of a considerable number of forts; and even in those where there were no remains it did not follow that they were not regularly inhabited, as the houses might have been of flimsy, easily perishable material.

THE GLASGOW SCHOOL OF ART.

THE opening lecture of a series on architectural study in the Glasgow School of Art was delivered on Friday evening, in the Lecture Theatre, by Mr. Wm. J. Anderson. Among those present were Mr. Campbell Douglas and Mr. Francis H. Newbery, the headmaster, and there was a large attendance of students. The lecture was a *résumé* of the evolution of architecture from the earliest times to the end of the Gothic period. It was pointed out that the history of architecture, like all other history, teaches that there is no such thing as continued and maintained progress and advancement. Thirty centuries before Christ some of the grandest architectural works in the world were erected—*e.g.* the temples of Karnac and Luxor, buildings which, at least in the qualities for which they are distinguished, have never been equalled. Besides that of Egypt, another important source of influence was the art of Assyria. Those met in Greek work, which, making use of the forms of both, combined also the majesty and dignity of Egyptian architecture with the freedom and picturesqueness of the Assyrian, and added great intellectual refinement and grace. The arch, freely used by Egyptians, Etruscans and Greeks in underground and engineering work, was only raised by the Romans to the dignity of a constituent part of the architecture. The Romans also made a more extended use of the vault and dome. Byzantine architecture was described as being merely the later architecture of Imperial Rome transferred to Byzantium, and there coloured and influenced from the East. The Byzantine architects continued the development of the dome. After the break-up of the Roman Empire decline in every respect followed in the western part, and for centuries art was crushed out of existence till the rise of the Lombard Romanesque. The progress of this style in Italy and Germany was noticed, and the contemporary phases known in this country as Saxon and Norman. The lecture concluded with a short account of some of the English cathedrals, illustrating the history of the Gothic style at home. Upwards of seventy lantern slides, besides diagrams of great buildings, added to the interest of the lecture.

DUBLIN, ANCIENT AND MODERN.

A LECTURE on the above subject was recently delivered in the Molesworth Hall, Dublin, by Mr. L. R. Strangways, vice-president of the Photographic Society of Ireland. Mr. Strangways said he proposed to take his audience for a stroll through the city, such a one as he often took with his hand camera. Speaking of the buildings of Dublin, the late Sir Samuel Ferguson had said:—"We live in Dublin in the midst of great but unnoticed beauties. If our Custom House stood on the banks of the Grand Canal at Venice we should soon see in the windows of our photographers something which would strike every eye as a lovely novelty." The first settlement of Dublin was lost in the mists of antiquity, and he needed not to trouble them with discussion as to whether the name signified "The Town by the Hurdles," or, as they were more apt to suppose, "Black Mud." The original walled town lay altogether on the south side of the Liffey, and was of extremely small size. The direction of the walls was settled to some degree by the course of the rivers Poddle and Liffey. The Poddle had been for so long arched over that many of them were almost unaware of its existence; yet it is even at the present day employed to drive a mill in the very heart of the city, and he had been informed that the damming of the stream necessary to give the required water-power was the main cause of the flooding of the Poddle which was attended with such disastrous results in St. Patrick's. In no respect did old Dublin differ more from its modern successor than in the absence of bridges. Just as in London until 1750 London Bridge was the sole means of communication with the southern suburbs, so in the case of Dublin, "The Old Bridge," built in 1428, stood alone. In 1700, however, there were five bridges across the Liffey. Of the great circling wall, with its towers and gates, no vestige remains. Audoen's Arch is almost the sole relic of the walls of Dublin, and it very narrowly escaped being pulled down in 1880 by the City Fathers on the amazing plea that it was impossible to keep it clean. A portion of the old graveyard close at hand has been laid out as a recreation ground. The lecturer then exhibited a photograph of Speed's map of Dublin, made in 1610, showing the very extensive colony which had been established by the Danes on the north side of the river, and the abbey of St. Mary and church of St. Michan which

had been erected. The Liffey at that time came within a very short distance of the spot where the walls of Trinity College now stand. In 1649 Ringsend was the harbour of Dublin, and Cromwell landed there in that year. Vessels of from 50 to 100 tons could only enter the river; but so greatly has the harbour been improved since that time that the *Great Eastern*, the largest ship yet built, could enter the river and lie beside the quay wall. This improvement was chiefly due to the establishment in 1708 of that mysterious body known as the Ballast Board. The soil dredged by them during 130 years or so has been used to fill up the slob lands which existed, and on the lands so reclaimed from the sea stand many of the finest streets, such as Brunswick Street, and on the north side all the district below the Custom House. Essex Bridge was built in 1676 with the stones of St. Mary's Abbey, and had a number of little shelters for foot passengers. The bridge was rebuilt in 1756 in a new form as an exact model of Westminster Bridge in London. The present bridge has been widened by metal wings and the arches lowered. Beside Essex Bridge in 1707 was built the Custom House, but the building was found too small for the increasing trade of the city, and in 1781-91 the present glorious pile was erected. After referring to the Custom House, Post Office, St. George's Church and the ancient abbey at St. Mary's, the lecturer brought his audience to St. Michan's Church, built by the Danes at a very early period in the midst of their colony. With regard to the Four Courts, two great artists shared the honour of its erection—Cooley and Gordon. There are some fine statues in the hall, but the statue of *Truth*, which stood originally in the centre of the hall, was deemed so unsuitable an ornament that it was removed to the lawn of the King's Inns. Mr. Strangways also referred to St. Audoen's Church, Christ Church Cathedral, the old Dublin Tholsel, and St. Werburgh's Church, in connection with which many points of exceeding interest were mentioned. The City Hall was built originally as a Royal Exchange, which was erected from Cooley's designs in 1769, and stands on the site of an older Exchange, Lord Cook's House, afterwards the famous Lucas Coffee House. The foundation rests on a belt of rock which runs from this spot under the river as far as Liffey Street, and is called "Standfast Dick." The older styles of Dublin architecture are rapidly being improved out of existence, and we now possess few even of the Queen Anne period houses, and none of earlier date.

GLASGOW INSTITUTE OF ARCHITECTS.

THE following is the full text of the letter addressed to the town clerk, Glasgow, of which an abstract has been given:—
115 St. Vincent Street, Glasgow :
November 21, 1894.

Sir,—The Council of the Glasgow Institute of Architects desire respectfully to ask the attention of the Honourable the Lord Provost, the magistrates and the Town Council of Glasgow to the designing of the public buildings of the city.

In the case of the municipal offices in George Square and that of the art galleries in course of erection by the Association for the Promotion of Art and Music in Glasgow, a desire was shown, and some consideration given, to secure that the designs should be worthy of the important purpose that each of those buildings was to serve. With buildings of secondary, but still of great importance, no corresponding effort is made. The Council of the Institute submit that the design and arrangement of such buildings are, as much as those of the larger edifices, worthy of every attention and care that can be bestowed on them.

The Council of the Institute are of opinion that the designing of important public buildings cannot be satisfactorily done by the department of the master of works or of the city engineer, and still less when the head of that department is an engineer than when he is an architect. The duties of the office include, among others, the charge of the public streets, and the design and superintendence of numerous and important works of engineering, as well as assisting and advising the committees of the Town Council in connection with health, gas, water, paving, sewerage, city improvement trust, railway and subway operations, and many other works, and it is evident that in a city of such magnitude as Glasgow, these duties must be of a very onerous nature. To relegate the designing of important works of architecture to the assistants of a gentleman who is responsible for the efficient discharge of such duties as the foregoing, and who is himself not an architect, seems to the Council of the Institute to indicate a want of appreciation of the position which architecture should occupy in an important city.

The Council of the Institute refer to the practice prevailing in most of the large English cities, and to the recent appointment of a committee of the City Council of Sheffield "to inquire and report whether or not the city surveyor might reasonably be expected to undertake the responsible architectural work of the city, and also satisfactorily discharge his other duties." This

committee have made an interim report with reference to certain proposed additions to one of the city court-houses, and after full inquiry have advised the Council that in their opinion "the city surveyor could not reasonably be expected to undertake the preparation of the necessary plans and detailed drawings for the additions." The City Council have since adopted this recommendation and have entrusted the work to a firm of independent architects.

In asking for the full consideration of this important subject and the appointment of a committee to inquire and report regarding it, the Council of the Institute solicit the attention of the Town Council to the following as a summary of their views:—

1. The city engineer, as he is not an architect, is not himself qualified to design works of architecture. Even if he were so qualified, the duties of his office are such that he cannot have the time at his disposal for the quiet conception and elaboration of the design of public buildings, nor for the efficient superintendence of such works in course of erection.

2. To depute such work to assistants, however qualified, cannot be so satisfactory as it would be to commission independent architects of ability and experience. An assistant has neither the stimulus nor the sense of responsibility of an independent architect, and there is no assurance of permanence in his position. Should he develop marked ability, it is probable that he will either elect to practise in his own name, or accept an office of more importance in another city. In dealing with contractors, in securing that the terms of a contract are faithfully carried out, and in the settlement of accounts an architect has more authority, as he has more direct responsibility, than any assistant, however competent he may be.

3. The existing arrangement is not an economical one, and on this ground alone the subject is worthy of full consideration.

4. The design and erection of the public buildings of a city are among the opportunities that architects are entitled to look to for the exercise of their abilities, and their employment would offer to the authorities a much wider field for the selection of architects possessed of special qualifications for particular work, than they can have among the assistants of the city engineer. The Council of the Institute do not undervalue the knowledge and experience of the master of works, of the city engineer, or of their staff, but they believe that the attainments of these gentlemen would be of more advantage to the community, so far as important public buildings are concerned, if they were used in the first place in advising the committees of the Town Council in charge of such works, and afterwards in consultation with the architects who should be employed to design them.

5. It is among the most important duties of a municipality, acting on behalf of the community they represent, to foster and encourage the arts, and particularly the art of architecture, upon which the amenities of a city are more dependent than on any other. The council of the Institute submit with confidence, that the course they recommend to the consideration of the Town Council, in addition to its other advantages and economies, would tend, both directly and indirectly, to the improvement of the architecture of the city.

Not only within the membership of this Institute, but also outside it, among architects of the city and others, there is a large fund of architectural ability and experience. The Council of the Institute respectfully ask the Town Council to consider how far this ability should be made available on behalf of the community under their charge.

In conclusion, the Council of the Institute desire to say that they are not impelled by any merely selfish or narrow motive, but that they ask for the consideration of a question of public policy on which they believe themselves to be entitled to express an opinion.—We have the honour to be, &c.

T. L. WATSON, President.

JOHN JAS. BURNET, Vice-President.

ALEXANDER PETRIE, Treasurer.

C. J. MACLEAN, Secretary.

PUBLIC BUILDINGS IN FRANCE UNDER THE FIRST EMPIRE.

(Concluded from page 354.)

272. **Bank of France at the Hôtel Toulouse.** Imperial Printing Office at the Hôtel Soubise.—Archives at the Hôtel Soubise, Palace Cardinal, Exchange and Tribunal of Commerce at Fides St. Thomas, Quay of the Military School. Buildings of the hospital abutting on the river to be demolished, March 14, 1808.

A decree made by His Majesty at the Palace of the Tuileries on March 6, 1808, contains the following enactments:—(1) The department of the registry and public lands is authorised to cede the Hôtel de Toulouse and its dependencies to the Bank of France. (2) This cession will be conditional

on the Bank of France paying a sum of two millions (80,000*l.*) to the Sinking Fund, one million before April 1 next, and one million before January 1, 1809. (3) The Hôtel Soubise and Palace Cardinal will be purchased by the Finance Minister and added to the public lands by a payment of 690,000 francs (27,600*l.*). This sum will be paid out of the first million advanced by the Bank of France. (4) The balance of 310,000 francs (12,400*l.*) out of the first million advanced by the Bank of France will be placed at the disposition of the Minister of the Interior, for the repair of the Hôtel Soubise and the Palace Cardinal, and the removal and installation of the Imperial Printing Office in one of these palaces. (5) The whole of the archives in Paris of every description are to be lodged in the palace which is not occupied by the Imperial Printing Office. (6) The second million advanced by the Bank will be devoted to the construction of a palace for the Exchange and Tribunal of Commerce on the site of Filles St. Thomas. The balance of the cost of this palace to be defrayed by the city of Paris. A further decree, dated Tuileries, March 11, 1808, contains the following provisions:—(1) An embankment is to be formed from the Pont de Concord to the Military School. The works are to be begun this season and are to be finished in six years. (2) The Quay Napoléon is to be continued, and the buildings of the Hôtel Dieu abutting on the river demolished.

273. **First Stone of the Exchange at Filles St. Thomas** (March 19, 1808).—On the 24th instant, the Minister of the Interior will solemnly lay the first stone of the building to be erected on the site of the Filles St. Thomas. The plan of the building for the Exchange and Tribunal of Commerce is a long oblong. The building will be dignified but simple in style. The only ornament on the exterior will be a series of sculptured medallions representing the moneys of Europe. The building will be surrounded by an Ionic portico which will serve as a promenade during the winter, and will be very similar in size to the galleries of the Palais Royal. On three sides of the palace trees will be planted in rows (*en quinconce*), which will shade the promenade in the summer. The principal front towards the Rue Vivienne will have an entrance doorway and a wide staircase leading to the principal hall of the Exchange. The plan is by M. Brongniard, who, with M. Cretel, the minister, will lay the first stone on March 24, 1808. [The building, which was inaugurated and opened on November 4, 1826, after being eighteen years building, cost 8,000,000 francs (320,000*l.*).] On January 1, 1809, M. Brongniard arranged to place twenty columns at the sides instead of eighteen, in order to get a vestibule two bays wide on the principal front. The intercolumniation is 11 feet between the centres of the columns. According to the model exhibited at the Salon in October, 1808, M. Brongniard, architect, M. Gisors, surveyor (*contrôleur*), M. Dords, clerk of the works (*inspecteur*), the architect's estimate is 2,200,000 francs (88,000*l.*), the superficial area of the building is 975 toises, which makes the cost 2,300 francs a toise superficial (or about 47*s.* a foot super). The St. Petersburg Exchange, by M. Thomas de Thonon, cost 7,500,000 francs (300,000*l.*) in 1816.

Works for the Season of 1808 (April 11, 1808).—The commencement of the season has been signalled by a resumption of the great works. Scaffolding has been erected to the triumphal arch of the Carrousel for the purpose of completing it. The Tuileries apartments are to be rearranged and decorated on a new plan. The Hôtel de Brionne will be pulled down for the purpose of erecting the grand north gallery, which will form a pendant to the south gallery. A portion of the pavement of the Place du Carrousel has been taken up and excavations are begun for the foundations. The court of the Louvre is well advanced, the four vestibules are being completed, and the carving (*ravalement*) of the east front has been commenced. The quay has been raised to the level of the Pont des Arts, from the designs of M. Fontaine, architect to the Emperor. The arch of the Etoile, now without columns and diminished in size, is progressing rapidly under MM. Chalgrin and Raymond. The Column of Austerlitz, Place Vendôme, by M. Gondouin, only wants the bronze ornaments, which are being proceeded with with activity. M. Delaunoy is carrying out the foundations of the Granaries of Abundance at the Arsenal and arranging the Bank of France at the Hôtel Penthièvre. M. Celerier is finishing the restoration of St. Denis and is superintending the archives at the Hôtel Soubise. M. Courtepée is arranging the Imperial Printing Office at the Palais Cardinal. M. Brongniard laid the first stone of the Exchange on the site of the Filles St. Thomas. It is proposed to erect a palace for the Academy of Fine Arts on the Quay Bonaparte, from the designs of M. Vaudoyer. The fountain of the Cordeliers, by M. Gondouin, is in use; several others by M. Bralle are finished and some are unfinished. The Pont St. Michel has been cleared of the houses, the abutments (*pilots*) of the Quay Napoléon are being built, and the Rue de la Bucherie and the Rue de la Hachette will be converted into a quay, which will add to the beauty and salubrity of the city. The Madeleine, by M. Vignon, has been decided on, after undergoing several modifications, and will be carried out. The peristyle of the

palace of the Corps Législatif, by M. Poyet, indicates already the proportions of the pediment with which it will be finished. MM. Viel and Clavareau are arranging new hospital wards to replace the buildings of the Hôtel Dieu, which are to be removed. The restoration of the Porte St. Denis has been suspended, owing to the death of the architect, M. Legrand, and the severity of the winter, but it will shortly be resumed (*Annales de l'Architecture*, &c.).

Gallery of the Louvre (April 13, 1808).—The new gallery of the Louvre has been commenced, of a greater depth than the gallery next the river. The foundations of the portion A are already in, the stone piers are out of the ground and the podium of the order is going on; it is about 20 toises* long. The portion B does not connect with the portion A, on account of the Hôtel de Brionne, D, which is not yet pulled down. The portion B is hoarded in and the excavations are being carried as far as the Rue St. Nicaise; it is about 30 toises long. The gallery A, B, C, including the return E, is about 260 toises long. It is estimated that the buildings will cost 50,000 francs (2,000*l.*) a running toise (or 328*l.* a foot), so that the completion will probably cost about 13,000,000 francs (520,000*l.*). The triumphal arch F, below the opening into the Rue Imperial G, H, comes out badly, inasmuch from the gate of the Louvre only the north angle can be seen. It should have been placed on a straight line G, as proposed by M. Coussin in his design for an orangery—a design which was very ingenious, inexpensive and well arranged. This line is shown on the plan for the embellishment of the Tuileries by MM. Fontaine and Gravé. How is it that the architect has deviated from his first design?

282. **Ancient Amphitheatre at Nice** (April 3, 1808).—Nice: April 3.—“We have here, in the Cimiez district, a Roman amphitheatre which attracts the curiosity of travellers. This monument of antiquity, however, which ought to have been preserved with the greatest care, has been so much neglected that the steps are sunk in the ground, and the whole is nothing more than a shapeless mass of ancient buildings interspersed with modern erections. The present owner, recognising the wrong done by the negligence of his predecessors, has endeavoured to repair the wrong, and by dint of care and labour has uncovered very nearly the whole area of the ancient edifice, which in many parts is well preserved; he has pulled down what obstructed the view of other portions and has enclosed the whole with a wall. These attentions have already received a portion of the recompense they deserve in a large number of medals and curiosities which the excavations have yielded to the owner.”

284. **Versailles, Estimate** (April 28, 1808).—M. Gondouin has been engaged during the last fifteen months, with M. Quin and several measuring surveyors, on the estimate for the restoration of Versailles. He went in October 1807 to Fontainebleau to see the Emperor, who wished to see the estimate. On seeing M. Gondouin, the Emperor spoke to him in Arabic. The architect replied, “Sire, if your Majesty speaks German I cannot answer you.” “It is not German,” said the Emperor to M. Fontaine, architect, and Marshal Duroc, who were there. “I said in Arabic that you were come to ask for money.” The Emperor was engaged with M. Gondouin for three hours on this estimate, which amounts to 30,000,000 francs (1,200,000*l.*). In April 1808 the water will be let into the Grand Canal. M. Trepsat, architect, asserts that it will hold water without repair, which is doubtful.

288. **Halle aux Blés** (June 1, 1808).—The Minister of the Interior, always anxious to encourage or usefully employ artists who display real talent, has commissioned the architect Belanger to restore the cupola of the Corn Market after his designs in cast and wrought-iron, covered with copper. This conservative method, which has not hitherto been employed by any nation for such large buildings, combines economy of construction and maintenance, stability, taste and convenience. M. Belanger has been long celebrated for the talent, celerity and good taste which distinguishes his buildings. He erected the Casino at Bagatelle in sixty-four days; stables at Choilly for 300 horses and 150 grooms in fourteen days; he designed the fine saloon of the Château of Maison, the fire brigade stations, &c. This artist has contributed so much to raise the taste and style of decoration, that he may be regarded as the author of the revolution which has taken place in the last thirty years in interior arrangements, furniture, as well as flower gardens and landscape gardening, for which he has been frequently employed since his return from England. In February, 1835, it was discovered that the walls, which had not been built to carry the roofing of the courtyard, which is 121 feet diameter, were crushing under the weight of the iron dome resting upon them.

290. **Gallery of the Louvre** (June 1, 1808).—The galleries of the Louvre next the river had merely casement doorways (*croisées avec des chaussees*) in the portion adorned with the grand Corinthian order. In 1760 M. de Marigny, superin-

* A toise is 1.947 mètres.

tendent of buildings, being desirous of establishing a communication between the Carrousel and the quay, caused three square-headed openings (*en plate-bande*) to be formed by M. Gabriel, architect, which were called *Guichet Marigny* and afterwards *Guichet Neuf*. In 1802, when Bonaparte was First Consul, he had a wicket formed by Fontaine, the architect, for his private use next the palace. The architect made it similar to the corresponding arch next the Carrousel.

In 1804 M. Raymond, the architect to the Louvre, whose jurisdiction extends up to the *Guichet Marigny*, opened up the first guichet to the east adjoining the *Guichet Marigny*. He made it an arch, but 6 centimètres higher than the corresponding one on the Carrousel side.

In 1806, Bonaparte having become Emperor, ordered the opening of twenty-five wickets under the large pediment-like gallery, and Fontaine, who was then the architect of the Louvre and the Tuilleries, was given the work. He made the first thirteen to the south of the *Guichet Marigny* similar to the first opened by him in 1802. When he came to the three *Guichets Marigny* he did not touch them, but when he came to the guichet by M. Raymond, which by mistake was made 6 centimètres higher than his own and those on the opposite side, carried on this mistake in the next twelve arcades as far as the *Guichet St. Nicaise*, so that these latter, which are at a lower level than those near the château, appear long, narrow and entirely different to the first thirteen arcades. There are therefore in this front, which is already full of defects, thirteen short arcades, then three wickets of unequal width with square heads (*en plates-bandes carrées*), then twelve very high arches. What an eyesore.

In 1808 the underpinning of the gallery of the museum, executed in 1778 by M. Brebion, having injured the trusses of the roof, measures are being taken to secure the trusses without removing them from their place.

Eight window openings are being formed at the end near the grand saloon, four on the south and four on the north.

At the same time the carving (*ravalement*) of the whole of the masonry of this gallery, to make it match with the Louvre, which is being scraped like new, is going on.

290. **Monument to M. Dubelley** (June 18, 1808).—The Emperor sends orders from Bayonne that Cardinal Dubelley, who died on June 13, 1808, aged 98, shall be interred in the metropolitan church of Paris, and that a monument be erected in memory of this worthy prelate in the same church.

294. **Ecouen** (July 6, 1808).—The palace of Ecouen has been assigned by His Majesty for an Imperial school, to be called after him, for young girls, daughters of members of the Legion of Honour, under the direction of Mdme. Campan. This pretty building, by J. Bullant and P. L. Delorme, was sacked during the Revolution. The restoration has been begun by M. Peyre's nephew. I visited the palace to-day with the latter, and found it in very good condition, and inhabited already by 200 boarders. The restoration will cost about a million francs (40,000*l.*).

295. **Sorbonne** (July 1, 1808).—M. Beaumont is commissioned to restore the church of the Sorbonne, which is now a ruin, through the inconsiderate alterations carried out in 1798 by M. Hubert, to convert it into a normal school.

Arc du Carrousel, Statue of the Emperor (July 22, 1808).—The statue of the Emperor was hoisted yesterday on to the Arc de Triomphe at the Carrousel. The statue, which is of lead gilt, as are also the two Victories holding on each side the reins of the horses, will be placed on the chariot.

Louvre. Progress of the Works (August 4, 1808).—The works to the Louvre are being pushed forward with considerable activity. The southern portion of the superb colonnade has been completely restored, the other portion will be certainly done before the bad weather. Doorways have been formed where Perrault had constructed niches for receiving statues. The entrance vestibule is adorned with fluted columns, three parts engaged in the walls; the soffits of the arches are ornamented with caissons and rosettes. Right and left are vast galleries vaulted in stone for the reception of antique sculpture. At the extremity of these galleries are two magnificent stone staircases. These staircases have turned out well (they are engraved in Perrault's design), and are constructed in the north and south angles of the colonnade to give access to the upper floors. Above the entrance doors two magnificent fragments of sculpture have been placed, which decorated the attics of the south face of the courtyard. The peristyles next the Rue du Coy and the Place du Muséum have been completely restored. They are separated by fluted columns supporting the ribs of the vaults. Above the cornice between the architraves are carved French eagles, of which the heads and the tips of the wings are all that can be seen. The Hall of Antiques, where the Institute formerly held its public meetings, has been almost entirely repaired. All the soffits (*arcs doubleaux*) have been ornamented with rich sculpture after J. Goujon. The two largest are divided into panels enriched with sporting subjects, with heads of hunting dogs above. At the springing of the vault are stags' heads. On the keystone are two figures of

Diana, one of which is copied from the beautiful statue of the goddess now in the Museum, formerly at Versailles, and the other represents the goddess going hunting. At the end of the saloon is a chimney-piece adorned with two fine statues, also by Goujon, representing Force and Justice. The main building next the Seine being larger than the others, it was necessary to divide it longitudinally into two portions, but as each of these portions would have been too narrow and mean if they had been equally divided, one was made larger than the other, but they are both well proportioned. It is not yet decided how they will be decorated. Scaffolding has been erected to complete the sculpture on the north and south fronts in the inside.



Sanitation of Hospitals and Infirmarys.

SIR,—We observe in your article on the "Sanitation of Hospitals and Infirmarys," in your issue of the 7th inst., you state that all refuse of every kind should be burnt in a properly constructed furnace, so constructed that the gases resulting from combustion are destroyed or decomposed before reaching the smoke-flue. We beg to call your attention to our Dr. Sergeant's patent incinerator, which is specially designed for this purpose. We enclose descriptive circular, and among the places where this apparatus has been adopted we may mention the West Riding Asylum, Wakefield; Winter Street Hospital, Sheffield; Bolton Rural Sanitary Authority, Birmingham Union Workhouse, Eastbourne Corporation, Prescott Union Rural Sanitary Authority, Ladywell Sanatorium, Salford; Jersey States, London Hospital, Hampstead, Knightswood Joint Fever Hospital, Partick, near Glasgow; Cardiff Infectious Hospital, Tooting Hospital (Metropolitan Asylums Board), Guernsey, Farnworth, near Bolton; Western Infirmary, Glasgow; Londonderry, Dundee, City Smallpox Hospital, Edinburgh; Birmingham Infectious Diseases Hospital, Govan Hospital, near Glasgow; County Council of Haddingtonshire, Newington Vestry, Monte Video and Trinidad.—Yours faithfully,

Manlove, Alliott & Co., Limited.

THOS. CANTRELL, Secretary.

Nottingham: December 10, 1894.

GENERAL.

The County Council have decided that the Liberator buildings on the Victoria Embankment are unsuitable for the purposes of a county hall.

Mr. J. M. Forrester has presented to the Corporation Galleries, Glasgow, a bronze group, *The Bull Fight*, by the Belgian sculptor, M. Clesinger.

A Theatre is about to be erected in Longton from designs by Mr. F. Matcham. The plans have been passed, subject to the drains being constructed to the satisfaction of the surveyor; to the openings in the proscenium wall being closed by wrought-iron doors; to the proscenium opening being provided with a fire-resisting screen, and to the gas-meters and heating apparatus being placed in properly-ventilated chambers of fireproof construction.

Mr. W. Renison, of Glasgow, has opened a studio for painting in Dublin.

A German Church in the Rue Blanche, Paris, has been opened. It was designed by M. Niemans.

Rev. H. J. Lawlor, F.S.A.Scot., at the meeting of the Society of Antiquaries of Scotland, described the contents of a ninth-century manuscript of the Four Gospels, preserved in Trinity College, Dublin, known as the Book of Mulling.

Mr. Wm. Dickie gave an address before the members of the Sheffield Society of Architects on Tuesday, his subject being "Wentworth House."

Mr. Henry Southall, F.R.Met.Soc., will, at the meeting of the Royal Meteorological Society on Wednesday, the 19th inst., read a paper entitled "Rainfall and Floods in the Catchment Basins of the Severn, Wye and Usk, November 1894."

General J. Michael, C.S.I., will lecture on "Forestry" at the meeting of the Society of Arts on Wednesday, the 19th inst.

An Exhibition of Scotch Art is announced at St. George's Gallery, 14 Grafton Street, W., the private view being held to-morrow (Saturday).

The Architect.

THE WEEK.

THERE are so few of WREN's works outside the Metropolis, the destruction of the Winchester Barracks on Wednesday morning is more of a loss in an architectural sense than could be any of the modern structures for military purposes. The Winchester buildings, it need hardly be said, were not planned as barracks. CHARLES II. admired the old city, which had suffered grievously for the royal cause, and, as he imagined he could be a controlling power at Portsmouth, he resolved to erect a palace at Winchester. The works were commenced in May 1683 from WREN's designs. The project was ambitious. There was to be a quadrangular group measuring 326 feet by 216 feet, with a cupola so lofty as to be seen from the sea. In addition, there was a broad street, with fine dwellings leading from the palace to the cathedral. A large area of ground was purchased for parks and gardens, of which a careful terrier in WREN's handwriting is still preserved in the library of All Souls, Oxford. The grounds were to be laid out by JOHN EVELYN. A river was also to be excavated, which would enable small vessels to pass to and from the sea. The "carcase" of the palace was completed and roofed, when operations were suspended by the death of the King. JAMES II. would not meddle with the works, and WILLIAM III. was no less indifferent. Queen ANNE was desirous to complete the building as a residence for her husband, but his death again stopped the works. The palace was useless until somebody proposed to turn it into an enclosure for prisoners of war, and during the continental wars it contained many inmates. Subsequently it was converted into barracks. That buildings in which wood was so largely employed should be used for many years in housing a large number of soldiers is evidence of the incapacity of the technical advisers of the War Office. More than an hour elapsed on Wednesday before a supply of water was available, and the old timber was meanwhile vanishing. Nearly the whole of the parts used for barracks are destroyed, as well as the stores. The fire arose while the men were in bed, and if it were not for their perfect discipline the consequences must have been terrible.

A MEETING of the Glasgow Architectural Association was held on Monday evening, when Mr. T. L. WATSON delivered a lecture on "The Thirteenth and Fourteenth Centuries in Italy." Some of the varieties of Gothic architecture that prevailed in the different divisions of the country were explained. The influence of the classical art of antiquity was felt throughout the whole Gothic period, and was seen in the general effect of breadth, in the horizontal treatment and the flat surfaces, as opposed to the vertical treatment and the deeply recessed openings and mouldings of Northern Gothic. It was also visible in the indiscriminate mingling of round and pointed arches; in the fondness for the single round pillar or shaft in place of the clustered column; and for the tapered form of pillar instead of the cylindrical form almost invariable in the North. There was a certain defect of the constructive sense seen in the prevalence of the iron tie rod to hold the arches together and in the overloading of slender pillars, apparently quite unequal to their task. The fact that they are still standing after 500 years is a proof that they are, in reality, strong enough, and something must be allowed for the known hardness and strength of marble, as compared with the building stones employed in the North. After every allowance is made, however, it has to be admitted that the apparent weakness of many of their buildings is a characteristic and serious defect. A third characteristic was the great wealth of colour produced by various marbles, brick and terra-cotta, and by mosaics and fresco paintings. Many of the painters were architects also, and even those who were not showed an intimate knowledge of architecture. The paintings were really allied to the buildings, and not merely applied. The architecture painted as accessory to the figures was in harmony with the lines of the building, and the figure subjects also had the

architectural qualities of symmetry, restraint and repose. The architecture, painting and sculpture of the Renaissance were then touched upon, and the same qualities were illustrated up to the middle of the sixteenth century, after which there was rapid deterioration.

By the death of Mr. ARTHUR COWPER RANYARD, M.A., the editor of *Knowledge*, on the 14th inst., the London County Council loses one of its most estimable as well as one of its most active and intelligent members. He was a member of the corporate property committee, the parliamentary committee and the Building Act committee, and took great interest in the preparation of the London Building Act, 1894. Mr. RANYARD was a barrister, but his tastes were rather for scientific subjects than legal matters, his favourite pursuit being the study of astronomy, in which he took great interest, and on which he published several treatises. Mr. RANYARD was a bencher of Lincoln's Inn, and in that capacity, as our readers will remember, was largely instrumental in preserving Lincoln's Inn Gateway, Chancery Lane, from the attacks of Lord GRIMTHORPE, who was anxious to pull it down.

COMMUNICATIONS received from the representatives of the Palestine Exploration Fund in Jerusalem announce the discovery of a remarkable specimen of Pagan inscription in that city. The iron-bound door of Neby Daûd, which had remained open against the wall for a number of years, was recently blown down during a severe storm, and on one of the stones behind it an inscription was perceived. It is a votive tablet to JUPITER on behalf of the welfare and greatness of the Emperor TRAJAN and the Roman people, erected by the Third Legion, which takes us back to the interval between the destruction by TITUS and the founding of Ælia Capitolina. The stone was partly covered with plaster, and may have been entirely concealed when the door was last opened and shut, which may account for its being unnoticed. It is built into the modern wall about 15 feet above the ground. Roman inscriptions are very rare in Jerusalem, and this discovery is therefore of exceptional interest.

AMONG the intellectual enjoyments of the French capital there was until recently hardly one that could compare with what was obtainable every Sunday in the garden and rooms in the Rue de Chateaubriand which belonged to the venerable JEAN GIGOUX. The painter had exhibited at the Salon from 1831 until 1894, and it might be said that all his competitors in that long period were his friends. It seemed impossible for JEAN GIGOUX to make an enemy. Representatives of the numerous schools looked on him as a sort of arbiter. Accordingly on every Sunday it was possible to meet painters, sculptors and architects in his modest house, who by no persuasion could be brought together elsewhere. It must not be supposed that the host was a gushing nonentity who sided with all men because he was without ideas of his own. The fact was JEAN GIGOUX was more remarkable for his character than for his ability as a painter. He was a man that could be trusted, for no temptation could make him deviate from the course he believed to be right. In a country where there is so much shifting, it was a gratification to find at least one man who was always consistent. No wonder therefore that so many friends hoped to see his works in the collection of living artists in the next international exhibition, and to celebrate his centenary in 1906. His death on the 11th inst. makes such a consummation impossible. Englishmen have reason to regret his loss. They found the warmest of welcomes from him, and he was glad to exhibit to them the pictures by their countrymen which he possessed. For JEAN GIGOUX was for years the only artist in France who believed in the English school, and if it is now appreciated we may thank him as one of the causes. During the greater part of his career the artist produced religious and historical pictures. Of late years he restricted himself to portraiture. His works are not much known out of France, but it is possible to obtain examples of his vigorous book illustrations, such as the *Gil Blas*, which he designed in his youth.

OLD LONDON STREETS AND HOUSES.

IF we could imagine the shade of one of the citizens of London who was ruled by a Tudor or Stuart king revisiting his old haunts, he would be as much surprised by the general administration as by the growth of the streets. There are so many complaints heard about the mismanagement of vestries and other local authorities, and especially during the past election week, it might be supposed that by the ancient charters the amenity of the Metropolis was one of the birthrights of the inhabitants. It is not remembered that the control of streets and buildings does not date from a remote age. If an Act were passed in the early days of the forthcoming session enacting as an urgent affair that every house in the Metropolis above a certain value should exhibit sculptured decoration on the front, it would not excite more amazement than was caused by the Paving Acts of HENRY VIII. In 1533 it was declared that the street between Charing Cross and Strand Cross should be paved at the cost of the owners of the adjoining lands, who were afterwards to keep the way in repair. Neglect was to be punished by the payment of twelpence to the king for every square yard that was not kept in a proper condition. A similar statute was issued in the following year for Holborn and Southwark. The paving thus became a State affair and defaulters had to reckon with His Majesty. If that arrangement were not made it may be doubted whether any municipal authority would have the strength to enforce the carrying out of the law. The difficulty of compelling people to co-operate for the improvement of streets is evident when we find that HENRY VIII. began tentatively with outlying portions of London. It was not until 1540 that a similar enactment came out which specified the street between Aldgate and Whitechapel Church, Chancery Lane, Gray's Inn Lane, Fetter Lane and the way between Holborn Bars and High Holborn. The penalty for not observing the statute was, moreover, reduced to sixpence a square yard. Three years afterwards other parts were comprised in the new measures, such as Whitecross Street, Grub Street, Long Lane, St. John's Street, the streets behind St. Clement's Church without Temple Bar, part of Westminster, &c. There was another change in the fines, for they were to be fixed at the discretion of the justices. In cases where the paving was executed by a tenant he was allowed to deduct the expenses from the rent paid to the lessor, unless there was an agreement to the contrary.

It was the duty of the mayor, aldermen and justices in the City and the justices of the peace in Middlesex to inquire into defaults, and any of them who was remiss must forfeit 5*l*. In the City all fines obtained under the statutes could be applied to the use of the mayor and commonalty. Under ELIZABETH the fines were increased to 3*s*. 4*d*. for every square yard that was not paved or repaired. A fine of 6*s*. 8*d*. per pole was also to be inflicted on those owners who neglected to scour and cleanse the ditch on the north side of Hog Lane.

It is evident, therefore, that under the Tudors the duty of keeping streets in what was then considered a proper condition was cast entirely on the individuals who owned the land on both sides. As a consequence they were generally so badly paved as to amaze foreign visitors. On paper it was easy to fix fines for every breach of the statutes about paving, but the citizens of London were never partial to legislation which encouraged informers and turned neighbours into enemies. The cleansing of the streets could not be otherwise than irregular, for it was the custom to cast the responsibility on some unlucky citizen who commonly evaded the duty by means of bribes, and the parish officers and labourers executed the work with as much ease to themselves as the circumstances allowed. In the time of CHARLES II. it was decreed that in every parish two tradesmen were to be chosen, who were to be the scavengers for the ensuing year, but they could refuse office by paying 20*l*.

The regulations concerning houses were more lax than those about streets and highways. An Englishman's house was his castle, and he might do much to make it a source of danger to his neighbours without any interference on the part of authority. By the ancient "Assize of Building" it was open to a citizen to demand that the mayor and a jury of twelve men should enforce certain regulations about

building which would have aided in diminishing the risks of fire, but apparently few cared to assert their rights in that way. Timber was the favourite material in London. Even when the Great Fire of 1666 had demonstrated its danger, we find the astute Sir WILLIAM PENN proposing to SAMUEL PEPYS that they should invest largely in Scotch timber, as it would be needed for the rebuilding of London. Apparently it was not anticipated by the comptroller that any changes in the mode of building would be demanded. A few years before the Fire, the Lord Mayor "a talking, bragging, baffle-headed fellow," had told PEPYS that he was resolved to pull down the shops in the City and to make a great thoroughfare; but so despotic an exercise of power did not appear to be feasible.

From occasional entries in PEPYS's "Diary," it is plain that he could not at first believe that London was to be laid out on a matured plan. He was told that the few churches selected for rebuilding were "not chosen with regard to the convenience of the City; they stand a great many in a cluster about Cornhill; but all of them are either in the gift of the Lord Archbishop, or Bishop of London, or Lord Chancellor, or gift of the City." He adds, "Thus all things, even to the building of churches, are done in this world." Interests of different sorts were an obstacle to the laying-out of the City in a convenient way. CHARLES II. considered that the proposal of Colonel BIRCH was the most prudent, which was that trustees or commissioners should be appointed, and for all the ground to be sold by them, preference being given to the former owners, instead of arranging for the disposal of the sites in patches. WREN's plan would appear to correspond with that proposal, but neither the Government nor the citizens could realise the necessity of such a disposal of what SPRAT called "the most advantageous seat of all Europe for trade or command."

The new city was as near as practicable on the same lines as the old. Some streets were enlarged, such as Fleet Street, Thames Street, Paternoster Row, &c., and the mayor, aldermen and commoners were permitted to make wider any passages that were less than 14 feet across, but the only new street mentioned in 19 Car. II. chap. 3, is one from the Guildhall to Cheapside, and which in consequence retains the dignity of being designated King Street. There is an anecdote recorded by PEPYS which reveals that the modern way of making the most out of an improvement is not novel. On December 3, 1667, he writes:—"Sir RICHARD FORD tells me, speaking of the new street that is to be made from Guild Hall down to Cheapside, that the ground is already most of it bought. And tells me of one particular, of a man that hath a piece of ground lying in the very middle of the street, that must be; which, when the street is cut out of it, there will remain ground enough, of each side, to build a house to front the street. He demanded 700*l*. for the ground, and to be excused paying anything for the melioration of the rest of his ground that he was to keep. The Court consented to give him 700*l*. only not to abate him the consideration, which the man denied; but told them, and so they agreed, that he would excuse the City the 700*l*. that he might have the benefit of melioration without paying anything for it. So much some will get by having the City burned. Ground by this means that was not worth 4*d*. a foot before, will now, when houses are built, be worth 15*s*. a foot." In this case the betterment question was easily solved without any exchange of money between the parties.

It was not to be expected that the Building Act of 1667 should be exacting in details. A great deal was gained when it was decided that "all outsides of buildings shall be made of brick or stone, or brick and stone together, except for doorcases and window frames, the bressummers and other parts of the first storey to the front between the piers, which at the discretion of the builder may be built of oak for conveniency of shops." Bricks were in those days not easily obtained in London, and it was found necessary to introduce a clause in the Building Act, in virtue of which, in case of combination or exaction by brickmakers, tile-makers and lime-burners, the Lord Mayor and aldermen could determine the prices and wages that were to be paid. Any man who did not accept the decision of the Corporation could be sent to gaol for a month in default of paying a fine. In spite of the authority, brickmaking was not

always profitable, for JOHN EVELYN, who was one of the wisest men of the time, lost the sum of 500*l.* in a speculation to produce bricks.

The Building Act of CHARLES II. suggests by all its clauses that it owed its origin to the Great Fire of 1666. Those which have followed it likewise reveal that fire is the danger which has to be opposed, and as far back as 1136 we have evidence of the existence of a similar fear. The Act which is about to come into operation is not confined to protection against fire. The clauses relating to open spaces behind buildings, and in some cases within them, to the ventilation of staircases, the heights of habitable rooms, and the conversion into dwelling-houses of buildings that were not originally intended for dwellings, are evidence that fireproof cities are not necessarily the most perfect. The change in legislation would appear extraordinary to the shade of our ancient citizen. He would probably consider that if he and his contemporaries adopted similar precautions to those in the Act of 1894, they might have enjoyed terrestrial life much longer. But he could hardly help wondering that with all the improvements, there is not a word in the new Act which could be interpreted in favour of imparting some touch of beauty to the new buildings. Security against fire and foul air is desirable, but it would be well to be assured that less pleasing buildings than those of the time of HENRY VIII. or CHARLES II. are an impossibility in London.

RHIND LECTURES IN ARCHÆOLOGY.

IN the fourth lecture of the series on "Early Fortifications in Scotland" Dr. Christison treated of the characteristics of the forts north of the Forth. The first district he dealt with was Argyle. Not only were the forts of the Argyle mainland widely separated from those in other parts of the Highlands, but within the county itself the distribution was very peculiar. In the northern part, including the extensive districts of Morven, Ardnamurchan, Ardour, Lochiel, and even taking in Nether Lochaber, which, although in Inverness, lay on the side of the Linnhe Loch, opposite Ardour, there were but three, one of which was quite isolated at the junction of Loch Leven with the Linnhe Loch, the other two being close to the north border of the county. In the inland, central and western part of the county a district penetrated by the large salt-water lochs that branched off from the Firth of Clyde, the forts were more numerous, numbering about thirty, of which nine were clustered round the fresh-water Loch Awe. But it was on a narrow strip of land running north from the Mull of Kintyre for about eighty-five miles that the great mass of Argyle forts were concentrated. Here they numbered no less than 143, and they were all on or within a few miles of the sea, either facing the Atlantic or on the little lochs that branched off from the ocean, or on the east side of the peninsula of Kintyre. And on that peninsula it was noticeable that they were more numerous facing the stormy Atlantic than on the sheltered side that looked on the Firth of Clyde. Another remarkable point was the abrupt termination of the group at its north end by a line drawn from Loch Etive through the island of Lismore. In fact, it might be said that the forts of the West Highland seaboard almost ceased there, as from this line to Cape Wrath there were not more than twenty-four fortified structures of any kind, six of which, on or not far beyond the north border of Argyle, were forts, while all the others were either known or suspected to be brochs. The lecturer then dealt in detail with the principal forts in the Argyle district, pointing out their chief characteristics by the aid of plans, and concluding with a description of the extraordinary one on the northmost of the Garveloch Isles, properly the Garbh Eilach or rough isles. Mr. Skene considered that this was the fortress of Connal Cearnach, one of the heroes of the Ulster Picts. Turning to the forts on the Highland mainland without Argyle, he said their most striking characteristics were their scantiness and their confinement in general to a few localities widely separated from each other. There were only fifty-two ascertained forts or sites of forts in this extensive district. Of these twenty-two were concentrated near the Beaully Firth and on the Black Isle of Ross, two were on the peninsula between the Firths of Cromarty and Dornoch, five on or near the west and north coasts, and nine in Caithness, and only fourteen remained for the vast interior of the district. Of these four were grouped around Loch Ness and eight were in the Highland part of Perth, completely cut off from the other Highland groups, and directly connected with the Lowland forts of their own county. Thus but two were left for the great valleys and glens of the central and north Highlands, viz. Dunbhairdghal, in Glen Nevis, and An Dun Strathmashie, Inverness. In describing the forts of the

north-eastern counties he explained that in point of size this group was remarkable for the large proportion that entered the highest class. No less than ten out of a total of forty-seven measurable forts ranked as large, compared with only two out of forty-eight in the Highland mainland, and none out of 167 in Argyle. The largest were the Brown and White Caterthuns, in Forfarshire, which were about 1,100 by 1,000 feet, and 1,260 by 800 feet respectively, and Burghead, on the Moray Firth, which was about 1,130 by 700 feet. In conclusion, Dr. Christison dealt with the forts in Fife, Kinross and Clackmannan, which did not exceed twenty in number. As to their distribution they seemed to avoid the coast, but perhaps the numerous fishing villages for which Fife was famous might have obliterated them there. The size in this group was a good average. None were found in the smallest class, eleven were moderate sized and one was large.

Dr. Christison, in the fifth lecture on early Scottish fortifications, dealt especially with the subject of the place-names in connection with forts. He considered the subject under the heads of the generic names by which the Scottish forts were or might have been designated. These were dùn, rath, car, lis and burh. The word dùn was by far the most important, and was almost the universal generic name for the forts in the Highlands. At the same time it was not to be concluded that wherever the word was met with a fort had existed, for dùn had several applications, its primitive meaning being a mound of any kind. About 110 of the Highland forts bore the generic name an dùn and nothing more; but about 260 had a specific name also. In some of these cases the specific name was descriptive or topographical. In a considerable number of cases it was personal, as Dùn Diarmaid. These names, however, were but a slender guide in determining the origin of the forts. In the Eastern and Lowland districts, in marked contrast to the universal application of the term in the Highlands, the applications of dùn to forts were very few, and in some large divisions there were scarcely any. On the other hand, in the Highlands the term was rarely applied to hills of any considerable height, while in the Lowlands it occurred in a large proportion of the very highest hills. The Scottish dùns had not been left altogether without historical testimony of their existence in the early annals, and in these there were notices of Dunolly, Dunadd, Dundurn, Dunaverty, Dunottar and Dunbarton. The term rath, according to Dr. Joyce, was applied in Ireland in general to a class of earthworks inferior in dignity to the dùns, and was very abundant there as a place-name. In Scotland the term did not seem to have been so frequently applied. He had made out under 200, a good many of which were questionable descendants of rath, and the proportion of these connected with forts was so meagre that it required some research to find them out. In the Highlands he could discover but two forts connected with rath—in Bute; and outside the Highlands there was apparently but one clear example of the root in connection with a fort—at Rait, Errol. The early annalists seldom mentioned raths in Scotland. The term lis or lios was, according to Joyce, the name of the third or smallest class of Irish forts. In Scotland the use of the term was scanty, and it did not appear to have any connection with forts. It might be questioned whether in Scotland lios ever meant fort at all. The term cathair in Ireland was appropriated to forts of stone. It might have migrated to Scotland, however, from Wales, where car, a rock, as in Ireland, appeared to be distinguished from caer, a fort. Then, the occurrence of car in England raised the question whether it might not have had a Teutonic origin; so that in Scotland it might have come from Irish, Welsh, or Teutonic sources. No doubt, however, the great majority of the Scottish names with the prefix car were of Celtic descent, but whether from the word signifying rock or from the word signifying fort, it was difficult to determine. The total number of place-names beginning with car in Scotland could not be very great. There were 150 in the county directory, of which twenty were in the Highlands and about a dozen were all he could ascertain to be in any way connected with forts. The burghs of Scotland might be descended from the Saxon burh or the Scandinavian borg.

In the concluding lecture he dealt with the characteristics of forts south of the Forth. Treating first of the Galloway and south-west coast groups, Dr. Christison noted their resemblance to the Argyll group in their low elevation, small size and proximity to the sea. No broch had been found in this district, and five vitrified forts had been claimed for it, as the lecturer thought, on meagre authority. Kirkcudbright, however, was the centre of the motes. In Dumfries, with its 225 forts, they were distributed as if to avoid the sea, and the elevation was greater. Neither brochs nor vitrified forts were claimed for the county, but rectilinear works and motes were pretty common. In Peebles and Upper Lanark the forts stood high and were pretty large in size. No brochs or vitrified forts had been discovered, and motes were unknown in Peebles, though a few had been claimed for Lanark. In the district between the Lammermoors and the Cheviots forts were numerous, especially on the side of the Cheviots, in Lauderdale, and up

the Gala Water. A couple of brochs and a couple of large rectilinear camps had also been noted. Between the Lammermoors and the Pentlands and the Forth there were upwards of forty forts and a few rectangular works, but neither brochs nor vitrified forts. In concluding the lecturer said he trusted it had been proved to their satisfaction that the subject of early Scottish fortifications had been wisely chosen by the Council of the Society of Antiquaries. It had been his aim to present carefully-ascertained facts rather than indulge in hazardous theories, and thus adopt a truly scientific method, and if they reflected that the subject, naturally an obscure one, was attacked for the first time scientifically, it would not seem surprising that he had been busied in laying a good foundation for future workers rather than in rearing a rickety and premature superstructure of his own.

SHEFFIELD SOCIETY OF ARCHITECTS.

THE monthly meeting of this Society, referred to last week, was held on Tuesday evening, the 11th inst., at the School of Art. In the absence of the President at the commencement of the meeting, the chair was occupied by Mr. F. Fowler, the treasurer, there being also present Messrs. C. J. Innocent, hon. sec., R. W. Fowler, J. Smith, T. Winder, J. B. Mitchell-Withers, J. E. Benton, W. C. Fenton, H. Webster, J. R. Wigfull, C. Gibson, A. J. Greenwood and many other members, and Mr. B. Bagshawe and other visitors. The following new members were elected by ballot:—Mr. George J. Gillham, Sheffield, as associate, and Mr. Thomas H. Robinson, Sheffield, as student.

The event of the evening was a lecture on "Wentworth House: historical, descriptive and illustrative, with practical observations on some materials used in the building," was given by Mr. William Dickie. The lecturer referred to the early ancestry of the Fitzwilliam family, and carefully traced the history of Wentworth Woodhouse from the middle of the sixteenth century to the present time, giving descriptions of alterations and additions at various times, dwelling upon the great work of 1741-43, with the names and interesting particulars of the various architects concerned. He then exhibited plans and elevations of the buildings, and explained in detail the dimensions, proportions and decorations of the principal apartments, showing detail drawings of the work. The drainage of the mansion, the cellar and water arrangements, and the ventilation of the main sewer were fully described. An interesting account of the mode of casting the roof lead, gathered from implements in existence at Wentworth, was given, and specimens of lead from the roofs were exhibited to show the action of various materials upon it when placed together. Samples of iron used in the work of Inigo Jones were produced, and slag, concrete and other materials.

Mr. E. M. Gibbs, president, who had arrived after the commencement of the meeting, proposed a vote of thanks to Mr. Dickie, and complimented him upon the excellent manner in which he had preserved the drawings in book folios, and thought in that respect architects generally might with advantage take a leaf out of Mr. Dickie's book. He felt sure that Wentworth would be largely visited by members of the profession if they knew how much there was to interest them. The motion was seconded by Mr. Reginald W. Fowler, and supported by Mr. B. Bagshawe (deputy coroner) and others, and carried with acclamation.

EMOTIONAL ARCHITECTURE AS COMPARED WITH CLASSICAL.*

HOW strange it seems that education, in practice, so often means suppression; that instead of leading the mind outward to the light of day it crowds things in upon it that darken and weary it. Yet evidently the true object of education, now as ever, is to develop the capabilities of the head and of the heart. He, therefore, who possesses a sound head and a responsive heart is worthy of enlightened guidance, is amenable to educational influence.

Let us now imagine a simple youth so equipped, so gifted, I am almost forced to say, an inborn poet, untalented, unschooled, and living an outdoor life. So familiarly has he fared with sunshine and air, and the living things, that they seem, as indeed they are, everyday and common to him. Yet the mere community of their lives, the similarity in the experiences of the boy, the plants and the animals in that native, simple, naïf, unsullied state that we who are perhaps unduly artificial call by contrast natural—this state has drawn him very near to them all.

Breathing the same air as they, maturing in the same glowing sunshine, sustained by the same satisfying moisture, he

and they expand side by side, defining themselves intimately to each other; and the boy, growing always, after a while feels himself to be not only with them, but of them. His is a brotherhood with the trees; a wistful eye he softens to the flowers; he has a comely friendship for them all.

He knows that the young leaves love the dew; that the tendril reaches quietly for the twig it may cling to. He has seen the fern unfolding its brown spiral to become anon green and regular. He has splashed knee-deep in the marsh; he knows the dank fragrance very well; he parts his friends the rushes to make a way for his eyes that seek what they may devour—his eyes with a keen and endless appetite. His hands touch the warmish water—sniffing the active air, he lives as only a boy can live—his lively sensibilities always in physical touch with his surroundings, in the full and irrepressible enjoyment of his five senses.

These five senses, and they only, stand between him and nature. It is they that interpret her affection, and the ready language that they deal in keeps him in such a natural sympathy, so well in touch, so intimately at ease, that he does not for a moment realise that he is then and there doing that which education so-called, once having made inoperative in him, he will in after years, poet though he be, reacquire only with the utmost difficulty the power to do.

This something that he is doing, and the physical and psychic state that it implies, we call "touch," meaning not the touch of the painter, not the touch of the sculptor, not the mechanical and technical touch of the fingers only, nor quite their negligent contact with things, but the exquisite touch of the sensibilities, the warm physical touch of the body, the touch of a sound head and a responsive heart, the touch of the native one, the poet, out of doors, in spontaneous communion with nature.

So has our youngster started easily and naturally, all alone without premeditation or guidance, upon the road to knowledge, to leadership and power. For this sensibility, this healthfulness, this touch, this directness of apprehension, this natural clearness of eyesight that is his is the first essential prerequisite in the early analytical strivings of the mind. It is that perfect concrete analysis by the senses and the sympathies which serves as a basis for the abstract analysis of the intellect.

Let us not forget our little man, for he is to companion me in spirit through this discourse. I believe he exists somewhere, has in his breast the true architectural afflatus, and will some day come forth the Messiah of our art. For he has that early and sure understanding by the eyes that will survive the future uncertainties of the brain. He has that exalted animal sense which alone can discern the pathway to hidden knowledge, that acute and instant scent in matters objective leading to matters subjective that we call intuition.

This physical endowment, this sense of touch is decidedly, wherever found, a generous gift of nature; but it is potent for results in so far only as it is urged into sustained and decisive action by a certain appetite or desire.

This desire, this insistence, this urgency which will not be denied; this uncomfortable hunger, this uneasy searching, this profound discontent, oh! so deep; this cry for more, this appetite, this yearning ever unsatisfied is not of the body alone but of the soul, and always and everywhere, in all times and in all places, high or low, wherever found, it is the dominant characteristic of man's eminence in nature—it is the justification of the eminence of a few men among their fellows.

For appetite, in a state of nature, implies not only a keen desire and a search for the food wanted, but, as well, a rejection of all else, thus insuring a wonderful singleness of purpose, a concentration of action, a definiteness of end in the selection of that nourishment of the faculties which, when assimilated, is to become in turn thought and expression through the agency of a second desire equally great, equally intense, equally insistent, namely, the desire to act. This desire to act we call imagination.

These two great desires, which are in essence the desire to absorb and the desire to emit, the desire to know and the desire to test, the desire to hear and the desire to utter, are the basis not only of a true and effective education, not only are they the wholesome body and the enchanting voice of art, but they are greater than these, for they are the animating quality of that higher purpose and significance of art that we call poetry.

Now, the desire to act that in due time follows upon nutrition can assert itself tangibly and fully only by means of three agencies, the which, by virtue of its life-giving qualities, this nutritive power has called into being. All three of them must co-operate in turn in order to produce a fully rounded result. They are, first, the imagination, which is the very beginning of action because it is a sympathy that lives both in our senses and our intellect—the flash between the past and the future, the middle link in that living chain or sequence leading from nature unto art, and that lies deep down in the emotions and the will. It is this divine faculty which, in an illumined instant, in that supreme moment when ideas are born, reveals the end with the beginning, and liberates, as an offspring of

* A paper read by Mr. Louis H. Sullivan at the Convention of the American Institute of Architects.

man, that which before had rested, perhaps for untold centuries, dormant but potential in the inmost heart of nature. This is the supreme crisis. This is the summit of the soul, the fertile touch of the spirit, the smile of nature's bounty—the moment of inspiration. All else is from this moment on a foregone conclusion, an absolute certainty to the master-mind; a task surely but not a doubt.

Second in this trinity comes thought, the faculty that doubts and inquires, that recognises time and space and the material limitations, that slowly systemises, that works by small increments and cumulations, that formulates, that concentrates, works, reworks and reviews; that goes slowly, deliberately; that makes very firm and sure, and that eventually arrives at a science of logical statement that shall shape and define the scheme and structure that is to underlie, penetrate and support the form of an art work. It is the hard, the bony structure, it is the tough, tendinous fibre; it may be at times, perhaps, as limber as the lips that move, yet it is never the need of smiling—never the smile.

Third, last and the winsome one, exuberant in life and movement, copious in speech comes expression, open-armed and free, supple, active, dramatic, changeable, beautifully persuasive and wonderful. Hers it is to clothe the structure of art with a form of beauty; for she is the perfection of the physical, she is the physical itself and the uttermost attainment of emotionality. Hers is an infinite tenderness, an adorable and sweet fascination. In her companionship imaginative thought, long searching, has found its own and lives anew, immortal, filled with sensibility, graciousness and the warm blood of a fully-rounded maturity.

Thus art comes into life. Thus life comes into art.

And thus, by reason of a process of elaboration and growth, through the natural storage and upbuilding of the products of nutrition lifting themselves higher and higher into organisation, the physical and spiritual experiences of our lives seeking reproduction shall find imaginative utterance in their own image in a harmonious system of thinking and an equally harmonious method of expressing the thought.

And so it shall come that when our nourishment shall be natural, our imagination therefore fervid, intense and vision-like, when our thinking and our speech shall have become as processes of nature; when, in consequence, from its mysterious abode in visible things, the invisible and infinitely fluent spirit of the universe passing to us shall have made our tongues eloquent, our utterance serene, then and not till then shall we possess, individually and as a people, the necessary elements of a great style.

For otherwise and without this unitary impulse our expression, though delicate as a flower, our thinking as abstract as the winds that blow, our imagination as luminous as the dawn, are useless and unavailing to create; they may set forth, they cannot create.

Man, by means of his physical power, his mechanical resources, his mental ingenuity, may set things side by side. A composition, literally so-called, will result, but not a great art work, not at all an art work, in fact, but merely a more or less refined exhibition of brute force exercised upon helpless materials. It may be as a noise in lessening degrees of offensiveness; it can never become a musical tone. Though it shall have ceased to be vulgar in becoming sophistical, it will remain to the end what it was at the beginning—impotent to inspire, dead, absolutely dead.

It cannot for a moment be doubted that an art work to be alive, to awaken us to its life, to inspire us sooner or later with its purpose, must, indeed, be animated with a soul, must have been breathed upon by the spirit, and must breathe in turn that spirit. It must stand for the actual, vital, first-hand experiences of the one who made it, and must represent his deep-down impression not only of physical nature, but more especially and necessarily his understanding of the outworking of that great spirit which makes nature so intelligible to us that it ceases to be a phantasm and becomes a sweet, a superb, a convincing reality.

It absolutely must be the determination and the capacity of the artist that his work shall be as real and convincing as is his own life; as suggestive as his own eyesight makes all things to him, and yet as unreal, as fugitive, as inscrutable, as subjective as the why and wherefore of the simplest flower that blows.

It is the presence of this unreality that makes the art work real; it is by virtue of this silent subjectivity that the objective voice of an art song becomes sonorous and thrilling.

Unless, therefore, subjectivity permeate an art work, that work cannot aspire to greatness; for whatever of imagination, of thought and of expression it may possess, these as such will remain three separate things—not three phases of one thing.

An artist must necessarily therefore remain a more or less educated hand-worker, a more or less clever sophisticator, a more or less successful framer of compromises, unless, when he was born, there was born with him a hunger for the spiritual, for all other craving avails as nought. Unless, as a child, with that marvellous instinct given only to children, he has heard

the voice of nature murmuring in the woodland, or afield or seaward, no after hearing can avail to catch this revelation.

And thus it is that subjectivity and objectivity, not as two separate elements, but as two complementary and harmonious phases of one impulse, have always constituted, and will always constitute, the embodied spirit of art.

No phase of human nature can contain greater interest for the student of psychology than the history—natural, political, religious and artistic—of the successive phases for good and for ill of objectivity and subjectivity. They are the two controlling elements in human endeavour. They have caused in their internecine warfare misery and perturbation. They are ordinarily known and spoken of as the intellectual and the emotional, but they lie deeper, much deeper, than these; they lie in the very heart of nature. Coming into man's being they have been antagonistic because of the fanaticism and one-sidedness of human nature, because of its immobility. Because from the beginning man has been beset by beautiful, by despicable illusions; because one set of men have believed in what they could see and another set have believed in what they could not see; because it has too often happened that the man who could see with the outer eye could not see with the inner eye; because the other man, rhapsodising with the clear insight of faith, had no thought for the things of this world, neither has believed in the virtue of the other. Neither has inferred from the presence of the other the necessary existence of a balancing but hidden power. Now and then through the ages they have come twin-born in the bosom of an individual man, upon whose brow the generations have placed the wreath of immortality.

So vast, so overwhelming is the power of a great, a properly balanced subjectivity, so enormously does it draw on the spiritual nutrition and stored up vitality of the world, that soon, sapping this up and still craving, the man possessed of it, urged by it, goes straight to the unfailing bounty of nature, and there by virtue of his passionate adoration, passing the portals of the objection, he enters that extraordinary communion that the sacred writers called to "walk with God."

There can be no doubt that the most profound desire that fills the human soul, the most heartfelt hope, is the wish to be at peace with nature and the inscrutable spirit; nor can there be a doubt that the greatest art work is that which most nearly typifies a realisation of this ardent, patient longing. All efforts of the body, all undertakings of the mind tend consciously or unconsciously toward this consummation, tend toward this final peace: the peace of perfect equilibrium, the repose of absolute unity, the serenity of a complete identification.

(To be concluded.)

EDINBURGH ARCHITECTURAL ASSOCIATION.

AT the last meeting of the Association Mr. S. Henbest Capper, architect, read a paper on "The Monks and their Abbeys in Olden Days." At the outset the difference was explained between the monastic life of the East, with its rigid asceticism, and that of the West, where the monks lived together for a common end. When the Benedictines fell away from the strict observance of their early rule, it was pointed out how a reformation towards more primitive austerity was begun at Cîteaux by Robert of Champagne, and was continued and spread by St. Bernard of Clairvaux, who was characterised by the lecturer as the greatest figure in the twelfth century. The Cistercian Order, to which St. Bernard belonged, also became popular all over Europe, and was especially so in this country, possibly, the lecturer suggested, on account of the more prosaic character of its ritual as compared with that of the Benedictines. By the aid of the lime light a large number of typical examples of Benedictine and Cistercian abbeys and churches were thrown upon the screen and their points of difference explained. Speaking of St. Bernard and his saintly character, Mr. Capper incidentally mentioned the great hymn of St. Bernard, "Jesu Dulcis Memoria," and recalled the fact that from it were directly taken two most admired hymns. In the Cistercian monastery the lay brother played an important part, and how his appearance there modified the architectural conditions of the abbey buildings was also illustrated and explained. Views were likewise shown of cloisters, kitchens, refectories, &c., and of the internal furnishings of the churches and cloistral buildings. There was a large audience, who listened to the illustrated lecture with the greatest interest.

The Designs sent in by French architects for the international exhibition buildings of 1900 number 112. Seventy-seven of the competitors met at the Palais de l'Industrie and elected the following jurors, who are accordingly to be considered as being without interest in any of the designs:—MM. Guadet, Coquart, Pascal, Laloux, Moyaux, Loviot, Sédille, Mayeux, Vaudremer, and Ginain. MM. Deslignères and Dutert were elected as supplementary jurors. The report of the jury must be presented before the end of the month.

TESSERÆ.

The Erection of the Parthenon.

SPEAKING of the Parthenon, a scholiast to Demosthenes tells us that "the Athenians, when they became more opulent, caused this third statue to be made of gold and ivory, in memory of the battle of Salamis, and on a scale proportionate to the importance of that battle." It is needless to say that the purpose of the statue determined that of the temple, which, therefore, must have been a monument of victory, in fact, a trophy. The above testimony is one of Wachsmuth's "popular legends and fables," which he supposes to have arisen, in some unexplained way, in late times. He does not seem to have taken the trouble to read the passage in Demosthenes to which the scholiast refers, else he would have seen that the "fable," as he calls it, is as old at least as the orator, who was born during the lifetime of many thousands of persons who saw the Parthenon built. The passage in question occurs in the speech against Androtion, in which Demosthenes, endeavouring to prove to the Athenians the value of a navy, says, "Those earlier men built the Propylæa and the Parthenon and adorned the other temples at the expense of the barbarians, temples of which we are justly proud; left their city, as you know, at least by hearsay, and having shut themselves up in Salamis, were able, from having triremes, to conquer in the naval battle, and so not only to rescue their own property and political institutions, but also to confer upon the rest of Greece many great blessings, of which time can never obliterate the memory." Here is direct evidence, if any evidence is direct, that the Parthenon was considered to have been built with money derived from the share of Persian spoil vowed by the Athenians to the gods. Instead of presenting the share of the booty directly, the Athenians waited until they were in easy circumstances, and then applied a sum of money, equivalent to said share, to erecting and adorning monuments fit for the acceptance of the gods. This is the plain sense of Demosthenes's words, which does not in the least conflict with the well-known fact that the money with which the Parthenon was built was immediately derived from the treasury of the league of which Athens was the head. For some time after the Persian wars the Athenians were in such straits that they doubtless felt themselves justified in borrowing, and applying to the fortification of their city, the share of booty that belonged to the gods. It did not, on that account, cease to belong to the gods, and the Athenians took the first opportunity of paying it back to them, which opportunity occurred in the time of Pericles. When, therefore, Wachsmuth makes the scholiast say that the Parthenon was constructed from the booty taken at Salamis, he puts a forced meaning upon his words, in order to find him in error. These words imply the very reverse, for they tell us that the image was not erected until the Athenians were in easy circumstances. It is hardly necessary to mention the fact that the Athenians habitually borrowed from their goddess, and, like many other borrowers, were often unable to repay. It follows from this that there is no ground whatever for asserting that the Parthenon was less closely connected with the Persian wars than any of the buildings of Themistocles or Kimon. Indeed, in a certain sense it was more closely connected with these than any other building in Athens, for its opisthodomos was used as the treasure-house of the league of which Athens held the hegemony, and both league and hegemony were direct results of these wars. Unless Demosthenes's words are mere impertinent platitudes, they mean that both the Propylæa and the Parthenon were directly connected with the results of the battle of Salamis.

Twelfth-Century Houses.

It is probable the Normans after their arrival in England adopted the dwellings they found in existence until the necessity of their removal, through decay, induced the re-erection of the buildings in an improved and more commodious form, and it began to be found that the repeated destruction by fire of the frail tenements of their predecessors induced the necessity of a change in the material of the houses. Accordingly, in the twelfth century stone with shingle or thatch as a roof covering began to be employed by those who had the means of doing so. This of course tended to confine the ravages of fire to the building where it originated, but the houses thus erected were comparatively few in number, and it is to be remarked that in the decrees of the Assize of London, in the first year of Richard I.'s reign, no provision is made for chimneys. Richard's ordination says the walls were to be 3 feet thick, 16 feet high and of hewn stone; upon these were built wooden gables of heights irregular, and instead of thatch they were to be slated or covered with brent tile. But this material must have been very sparingly used, as we find, so late as 1472, the buildings were remaining uncovered for want of the article, there being "none to get for no money;" so that probably, notwithstanding the royal command, thatch was extensively used interspersed with wooden shingle, and in a few cases lead

was adopted. This is a very curious document, containing much valuable detail respecting town houses in the twelfth century—among the rest, the privileges accorded to all who should rebuild their timber buildings more substantially in stone with tile roofs; regulations as to party walls (the *avant courier* of a Building Act) are inserted, together with some instructions as to drains, cesspools, &c.

Dates on Bells.

It is difficult to guess the exact date of the oldest bells that have come down to our times. Dates there are none at that early period, rarely even the founder's mark or lettering, which may give the exact cue. In bells of the fourteenth and fifteenth centuries there is not this difficulty; for, though they are rarely dated, they invariably have shields, lettering and other architectural devices which enable us to form a tolerably correct guess at their date. These marks, however, are by no means infallible guides to the uninitiated in such matters; for foundries often went on for generations, and marks and stamps were handed down from father to son, often for a century or more. A little close inspection, however, will usually afford some slight addition, either in the stopping or moulding, which decides against the hoped-for antiquity. Mediæval shields and lettering are to be seen upon bells only dating early in the seventeenth century; a date in Arabic numerals often unravels the mystery. Dates came in about 1570 in England, and have been continued ever since. In foreign countries they are met with much earlier. The earliest known dated bell is at Freibourg. Its diameter at the mouth, according to Mr. Tyssen, is 57 inches; height, 5 feet 5 inches; weight, about 2 tons. The inscription is, "O Rex Glorie veni cum pace,—me resonante pia populo succurre Maria, A.D. 1258." At Dunston, in Sussex, is a bell which Mr. Tyssen supposes to be the earliest dated bell in England. The date on this is 1319. This also is of foreign manufacture. At All Hallows Staining is another, with an inscription in honour of St. Martin, dated 1458.

Greek Vases.

When we regard those ancient works in the early purity and youthful freshness of the Greek style, the beauty that pervades those insignificant objects of the potter's art appears truly surprising. It would be difficult to illustrate the power of art more forcibly than by contrasting the exquisite outlines of that very early Greek earthenware with the pots and pans of this vulgar modern world. There is perhaps no greater manual dexterity, no more mechanical skill shown in one than in the other; there may indeed be less exactness of execution in the old than in the new works, but the one has those peculiar qualities which the educated eye at once recognises as the elements of beauty, whilst the other lays claim to no attention and has no æsthetic merit. Certainly it is a phenomenon that would be very surprising, were not the fact so familiar to us, that during the two thousand four hundred or two thousand five hundred years that have passed since the best of those fictile works were produced—a period which comprehends the whole history of human civilisation from the period of primæval simplicity down to the vulgarities of the nineteenth century—there has been an unceasing struggle to alter, vary and improve; after indulgence in every species of novelty, excess and caprice, we have never succeeded so nearly in producing forms beautiful in shape and colour as when we have copied the old Greek type. Beautiful things of this nature have been found in Oriental art; beautiful in Mediæval art; beautiful, too, in the age of the Renaissance; but analyse those several beauties, and you will find that those please us most in proportion as they approach the nearest to that wonderful type. This is not encouraging to modern invention; it is not gratifying to modern vanity; but it is true, and therefore demands our observation. At all events it should teach us modesty, and stimulate us to respect and to study those examples which our earliest teachers have set before us. Whatever may be the cause, the fact is undeniable that though the arts and sciences are usually regarded as kindred pursuits, and are supposed to be intimately associated, they are in truth widely different in their history and destiny. Science has been progressive; step by step men have advanced in the knowledge of the exact sciences as time has advanced. The step of to-day helps us on to the acquirement of a further step to-morrow, and the horizon is thus ever widening as we advance. Quite otherwise seems the destiny of art. The small objects of art illustrate this anomalous fact, and so perhaps may be said of almost every other object of design in the sister arts as well as in architecture. Has Raphael yet been surpassed? Have the works of Phidias yet been rivalled?

Absorption of Water.

The amount of rain capable of being absorbed by the surface upon which it falls depends in a great measure upon the temperature, the geological construction and the physical outline of the district. In making calculations as to the amount absorbed, we must bear in mind that the area of the surface is

the only constant quantity we have to deal with, as its condition and capability for absorbing water vary considerably with the seasons of the year. Under such varying conditions the amount of water absorbed and capable afterwards of being used, when issuing from springs or by sinking wells, is extremely capricious. The greater the quantity of water evaporated or retained by vegetation, the less will remain to be absorbed. Rain descending upon a dry and parched surface in the heat of summer or during the occurrence of drying winds will be nearly all evaporated, so that the rate and amount of absorption depends materially upon the absorbent properties of the soil. Thus in the sands of the red sandstone formation the rainfall is absorbed as fast as it touches the surface, and the same may be said of the rain falling in many places on the chalk formation, while upon the clay soils, or impervious formation, the greatest part of the rain would generally be directly conveyed away by surface streams. The contour of a country in a measure affects the rate of absorption, as the rainfall on mountains or hilly districts has a greater tendency to gravitate rapidly to the rivers, while on table-lands the rainfall lingers, and consequently such lands are favourable to absorption. Experiments made by Dr. Dalton extending over three years on the new red sandstone formation show that 25 per cent. of the whole rainfall percolated to a depth of 3 feet. Experiments made at Fernbridge, in Wiltshire, by Mr. Charnock, on the magnesian limestone formation resulted in giving but 19.6 per cent. of rain percolating to a depth of 3 feet; and a like experiment made by Messrs. Dickenson and Evans on the sandy gravelly loam which covers the chalk about Watford gave as much as 30 per cent. of the rainfall percolating to a depth of 3 feet. In this experiment the average rainfall was found to be 26.33 inches per annum, and the average mean filtration 7.92 inches per annum. Of this quantity 7.34 inches were absorbed between October and March inclusive, which was at the rate of 55½ per cent. on the rainfall of that period, while between April and September inclusive only 5.8 inches of rainfall were absorbed, which was at the rate of 43 per cent. of the rainfall of that period. From this latter experiment it appears that the largest amount of rainfall is absorbed during the months of November, December and January, when practically all may be said to have been absorbed, and that the least amount at any time absorbed was in the month of August, when practically it was nothing. It has been calculated by Beardmore that of the rainfall absorbed in winter 60.7 per cent. is carried off directly at the time of the rainfall, leaving 39.3 per cent. to supply rivers and wells, and of his probably only 33 per cent. of the rainfall absorbed really goes to furnish a supply for wells, which in a measure will account for the failing of many ordinary wells in certain seasons of the year.

Building Materials in Ceylon.

The habitations of the lower class of natives are formed of a rude framework of stout bamboos, the sides and roofs consist of reeds, closed in with the interwoven leaves of the cocoanut palm, the latter being washed over with the slimy juice of a native fruit, which, when dry, resembles copal varnish. In the huts built of "wattle and dab," the framework is made of roughly squared jungle trees, the space between being filled, and both the inside and the outside of the hut being covered with clay and sand well kneaded, afterwards plastered over with earth thrown up by the white ants, mixed with a powerful binding substance produced by the ants. Superior houses are built of "cabook," a soft kind of rock, found at a few feet below the surface. This material has the appearance of a coarse sponge, the interstices being filled with soft clay. Before being used the blocks should be exposed to the rain, to allow some of the clay to be washed out. Cabook requires to be protected from the weather, but if covered with a thin coating of lime plaster it will last for years. Hard kinds of stone are not much used owing to the expense of working them, and rubble masonry is not approved, as there is difficulty in obtaining even beds and good bond. Bricks as a rule are so badly burnt and the clay is so badly pugged that brickwork in exposed situations and unprotected will perish very rapidly. It is advisable that should in all cases be well plastered with lime mortar. Two or three coats of boiled linseed oil will preserve brickwork without hiding it, but the expense prevents its general use. Coal tar is an excellent preservative, but on account of its unsightly appearance it cannot be often employed. Lime is generally made by calcining white coral. When taken from the kiln it is in a fine white powder fit for immediate use, after being mixed with twice its own bulk of sand and water. It sets so rapidly that in the Public Works Department it is the practice to keep the lime under water for two days before using it. This has the effect of making it longer in setting, but it is more easily worked and eventually makes better work, equal in fact to the best blue lias lime. Well-seasoned timber, with free ventilation, will endure for many years if the white ants are kept away, without any precautions being taken to preserve it. In exposed situations and where subject to the attacks of the white ant, Stockholm tar is the best preservative, while

creosoted timber is free from their ravages. In sea water and even in fresh water lakes and canals, timber is speedily attacked by worms, notwithstanding that it is painted, oiled, or tarred. Iron exposed to the influence of the varying weather speedily oxidises, but oil applied hot is a good preventive. Coal tar is, however, the best covering applied either cold or hot, or before or after oxidation has commenced. Ordinary galvanised sheet-iron does not last many years unless protected with good red lead paint frequently renewed, but zinc will last for many years with little or no decay.

Church Bells.

Most, if not all, of our ordinary sound-producers send forth waves which are not of uniform intensity throughout. A trumpet is loudest in the direction of its axis. The same is true of a gun. A bell, with its mouth pointed upwards or downwards, sends forth waves far denser in the horizontal plane passing through the bell than at an angular distance of 90 deg. from that plane. The oldest bellhangers must have been aware of the fact that the sides of the bell, and not its mouth, emitted the strongest sound, their practice being probably determined by this knowledge.

Positive and Relative Beauty.

In architecture, however, as in the highest and most complicated works of nature, two distinct properties of beauty are found to exist—the one is "the positive," or beauty of individual parts; the other (and this by far the most important in respect to architecture) is "the relative beauty" of individual parts to each other, and their connection in an uniform, consistent and harmonious whole. Now, it must be perfectly evident to any observer of nature, that harmonious relationship of parts is the most essential concomitant of beauty and perfection in all constructions which involve plurality and variety of parts. No one could imagine the legs of the elephant to have as good an effect if surmounted by a body of the proportions of the race-horse, as by the huge and solid mass which nature designed them to sustain; or that the delicate head and neck of the giraffe, or the soft and downy wing of the ostrich, could be transferred to bodies of an opposite character to their own, without the most offensive results as regards the laws of proportion, fitness and just relationship of parts, without which excellence, in any complicated production, can never be attained.

Cicero's Tusculum Villa.

If the summit of the Palatine had been selected to keep the memory of its occupant ever fresh in the minds of his countrymen, his villa at Tusculum was his chosen spot for retirement and study. Here, also, though too far removed from Rome to be himself an object of observation, his porticoes opened upon the full view of his beloved city, from which he could never long bear to take off his eyes. From the hill on which this villa stood the spectator surveyed a wide and varied prospect, rich at once in natural beauty and historic associations. The plain at his feet was the battlefield of the Roman kings and of the infant commonwealth; it was strewn with the marble sepulchres of patricians and consuls; across it stretched the long straight lines of the military ways which transported the ensigns of conquest to Parthia and Arabia. On the right, over meadow and woodland lucid with rivulets, he beheld the white turrets of Tibur, Æsula, Praeneste, strung like a row of pearls on the bosom of the Sabine mountains; on the left, the glistening waves of Alba sunk in their green crater, the towering cone of the Latian Jupiter, the oaks of Aricia and the pines of Laurentum, and the sea, bearing sails of every nation to the strand of Ostia. Before him lay far outspread the mighty city, mistress of the world, gleaming in the sun with its panoply of roofs, and flashing brightness into the blue vault above it. The ancient city presented few towers, spires, or domes, such as now arrest the eye from a distant eminence; but the hills within its walls were more distinctly marked, and the statues of its gods—exalted on pillars, or soaring above the peaks of its innumerable temples—seemed an army of immortals arrayed in defence of their eternal abodes. From the bank of Lake Regillus to the gates of Tusculum the acclivity was studded with the pleasure-houses of the noblest families of Rome. The pages of Cicero commemorate the villas of Balbus, of Brutus, of Julius Caesar; of Catullus, Metellus, Crassus and Pompeius; of Gabinius, Lucullus, Lentulus and Varro. Accordingly, the retreat of the literary statesman gazed upon the centre of his dearest interests, and was surrounded by the haunts of his friends and rivals. It was here that, at a later period, when his fortunes were re-established, he composed some of the most abstract of his philosophical speculations; but even these, too, partook of the air of the city and the tone of practical life. The interlocutors of his dialogues were the same men whom he had just left behind at Rome, or whom he might encounter among the shady walks around him; the subject of their conversations never wandered so far from their daily concerns as not to admit of constant applications to the times and constant illustration from them.

NOTES AND COMMENTS.

IT is evidently an expectation in the Scottish Courts that an architect must be always in a serious mood and is not to attempt a joke, although he may be courting. Mr. MACLEAN, of Edinburgh, has suffered because he displayed a weakness of that kind. He sought the recovery of 118*l.* 13*s.* for preparing plans for a hotel at Glenfarg and other professional services. The defendant's version was that in March, 1893, Mr. MACLEAN, who had a short time previously been introduced to his daughter, asked permission to pay his addresses to her on the representation that he was successful in business, possessed of means and of good position. The permission was granted, and the happy pair some time afterwards became engaged. In order to do the plaintiff a good turn defendant introduced him to the proprietor of Glenfarg. The plaintiff knowing that defendant was looking out for a hotel, suggested that he should erect one at Glenfarg. By request Mr. MACLEAN prepared plans for the hotel, which, he said, could be erected for 600*l.* When tenders were received for the building it was found that the cost of erecting it would be 2,000*l.*, and defendant declined to go on further. Without admitting liability, he offered 10*l.* 10*s.* in full of the architect's claim, and maintained that the remainder of the account was unwarrantably incurred by the pursuer. Lord STORMONTH DARLING, who heard the case, said he held it to be proved that the plaintiff undertook to give his services gratuitously, the reason being that he was then the accepted suitor of the defendant's daughter, and said "he would take it out in live stock." His engagement was broken off, and it was creditable to the defendant that he afterwards agreed to pay him professional fees. In his lordship's opinion the authority which the plaintiff got was not to accept estimates except to the extent of testing his opinion that the hotel could be erected for 1,500*l.* He should give decree for the 10*l.* 10*s.*, and should find plaintiff entitled to commission at the rate of 2½ per cent. on the 1,500*l.*, and the decree would therefore be for 48*l.*, with half the costs. Although not half the claim, 48*l.* is better than 10*l.* 10*s.* The unlucky joke about live stock evidently was prejudicial to the architect, for "whigmaleeries" of that kind are not supposed to become a professional noddle.

In another case for the recovery of fees and in which the fall of a gable was pleaded as an excuse for nonpayment, the architect was not suspected of humour and he gained his money. Mr. DAVID FRAZER was the plaintiff. He claimed 3½ per cent. on 1,800*l.*, cost of extension of an hotel, besides other fees. The defence was that the gable fell because it was wrongly designed. The Sheriff who heard the case said the defendant failed to prove that the gable fell through the fault of the plaintiff, or that it was proved to have fallen because it had been newly built, and not because of a strong wind blowing at the rate of about fifty-five miles an hour. The extra claims were disallowed because they were presumed to be either for work that the defendant did not employ the architect to do, or they were covered by his commission of 3½ per cent., which was allowed with a sum for alterations. In a note the Sheriff said a host of small questions had been dragged into the case; but there was only one question of cardinal importance, and that was whether the gable in question fell through the fault of the plaintiff. In its strictly professional aspect, the accusation of fault took the form of an assertion that the gable fell because it was badly designed, and in particular because of the weight of the chimney over the building; and that plaintiff connived at bad mortar, either because of corrupt partiality to the builder, or because of offended pride because defendant appointed an inspector of works without consulting him. The only spark of truth the Sheriff saw in that part of the defence was that plaintiff's feelings had been hurt by the appointment of an inspector without communicating with him. He did not in the least believe that plaintiff betrayed defendant's interest. The fall of the gable was an inevitable accident, what lawyers called a *damnum fatale*. No practical man, he concluded, ever propped up such a gable, and to urge that this might have been done was absurd. This judgment is the more satis-

factory, as the defendant evidently mistrusted the architect and set a watch upon him, an act which deserved a heavier penalty than the payment of ordinary fees.

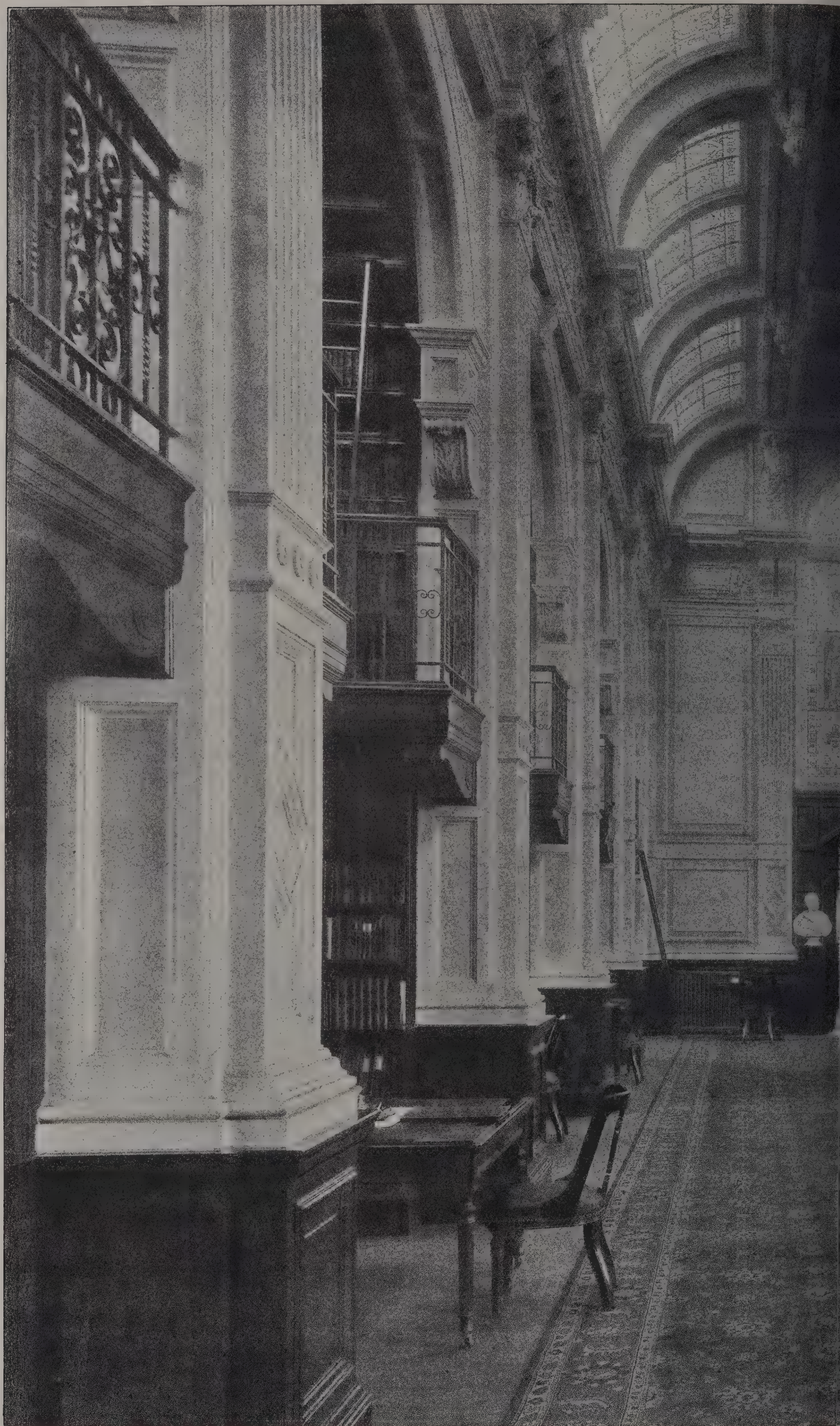
THE timber spire of the cathedral of Dijon was considered to be the most characteristic part of the building. In 1885, owing to its defective condition, it had to be demolished. It was not, however, the earliest example, for it had two predecessors. The spire or *fèche* was about 300 feet high, and from the smallness of the base presented a very acute appearance against the sky. Soon after the demolition M. SUISSÉ, the diocesan architect, prepared designs for a new spire, and after operations which have occupied seven years, and cost nearly 400,000 francs, it has been completed to the satisfaction of the inhabitants. The primary cause of the failure of preceding spires, it was conjectured, arose from a settlement of the piers rather than from a decay of the timber. It was accordingly decided to fill them with *béton*. No less than seven months were devoted to that part of the work, and about ninety tons of *béton* were laid. The spire has been carefully calculated in order that all the timbers will be of adequate strength. They form a series of triangles with horizontal bracing at regular intervals. The timber is covered with slates, with occasional openings for tracery, and near the roof slates are introduced. In its appearance the new spire surpasses its predecessor, and from the care taken with the foundations and carpentry we may assume that it is destined to have a longer duration. M. BILLETTE was the contractor under M. SUISSÉ, and he has been enabled to complete a most dangerous work without any accidents.

THE Hen and Chickens Hotel, in Birmingham, was not a picturesque building, but it dated from the early part of the eighteenth century, and it afforded shelter to actors, singers and agitators, with an occasional poet and man of letters. In his whimsical but ultra-logical way DE QUINCEY compared it with a more modern American hotel. He granted that "the Birmingham Hen and Chickens undoubtedly had slight pretensions by the side of these Behemoths and mammoths. And yet," he added, "as a street in a very little town may happen to be quite as noisy as a street in London, I can testify that any single gallery in this Birmingham hotel, if measured in importance by the elements of discomfort which it could develop, was entitled to an American rating." Birmingham has been changing, and the Opium Eater's adjectives, "gloomy, noisy and dirty," are no longer applicable to it. Examples of a new class of hotel were raised, with which the Hen and Chickens could not compare. It is about to pass away in order to afford a site for the new King Edward VI.'s High School for Girls, which it is anticipated will uphold the reputation of the town equally with the famous school for boys.

ANOTHER edition of the Building Act has appeared. It is edited by Mr. W. F. CRAIES, a barrister, and published by SWEET & MAXWELL, Limited. The notes are numerous and acute. Anomalies are not ignored. Thus, in one place it is pointed out that "new building seems to include stables pulled down and re-erected with the old materials, and houses erected without foundations." Another note calls attention to the fact that the materials specified in the second schedule as "fire resisting" are not specifically declared to be "incombustible" or "fireproof" within the meaning of the Act. Apropos of section 107, it is suggested that London county justices appear to have jurisdiction under the Act. Doubt is expressed whether section 138 does not include internal fittings and partitions in buildings as among the work that is subject to the supervision of the district surveyor. Novices who obey section 187 may not be aware that notices which "shall be in writing" may be printed, lithographed, photographed or produced by any other mode of representing words in a visible form. It is anticipated that most readers will be familiar with the former Acts. Accordingly the repeated sections are indicated as well as all matter which is new. It is essentially a lawyer's edition, but architects, surveyors and builders can also make use of it with advantage to themselves and their clients.

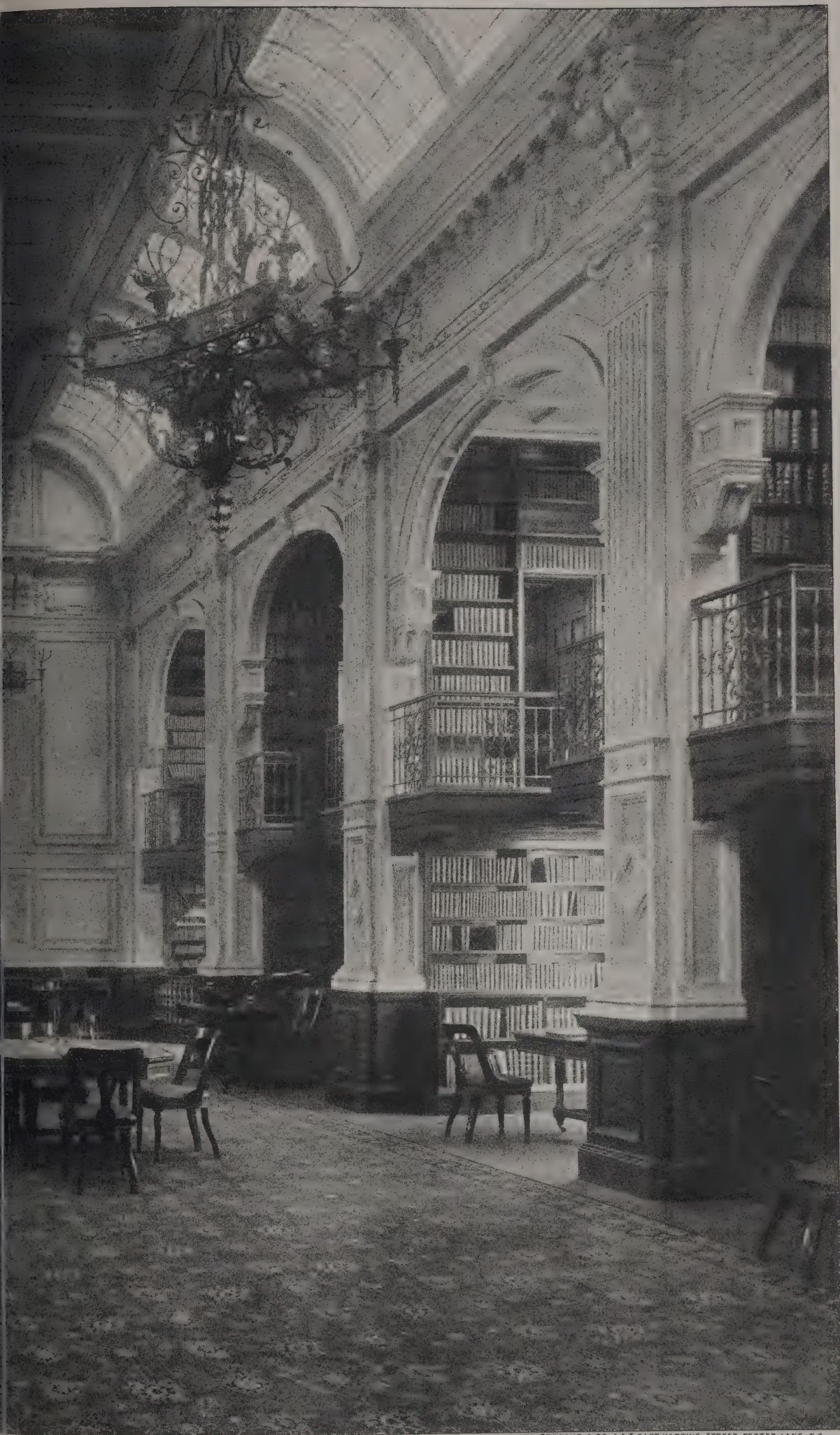






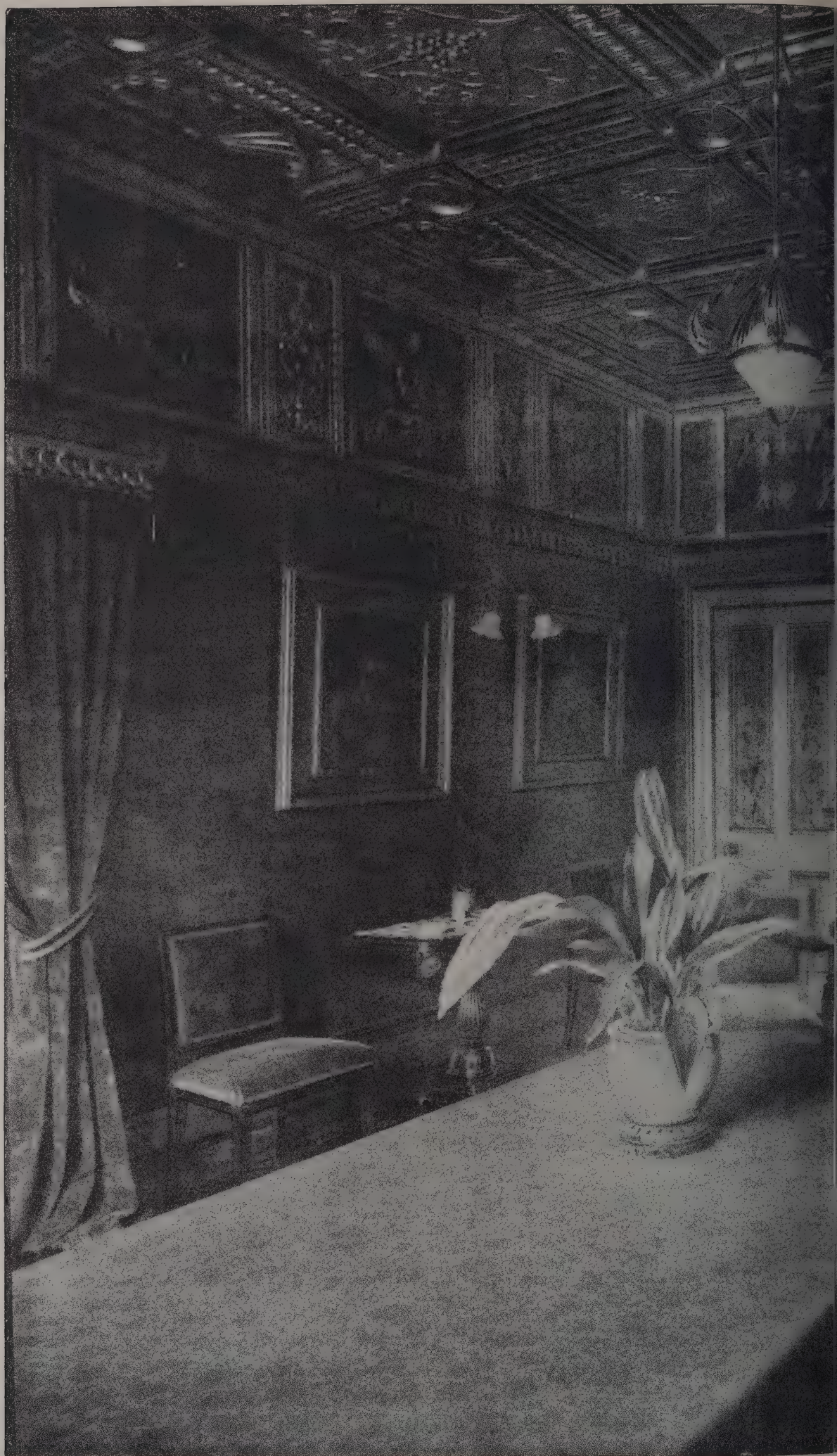
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PRINSEP, R.A.
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ILLUSTRATIONS.

MINERVA VISITING THE MUSES.

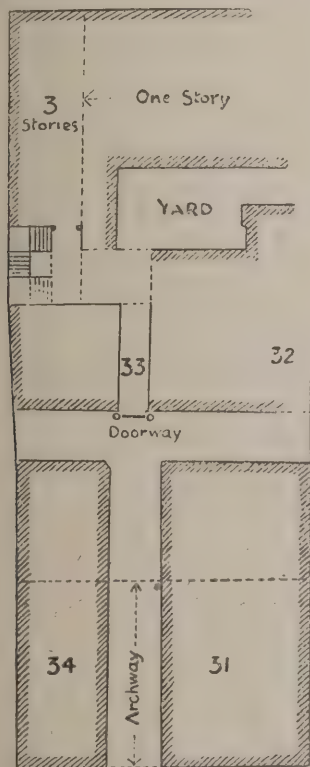
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NO. 1 HOLLAND PARK, W. RESIDENCE OF MR. VAL PRINSEP, R.A.

A DOORWAY BY GRINLING GIBBONS.

THE drawing, of which an illustration was published last week, forms the entrance to what is said to have once been the Spanish Ambassador's residence, and dates from about 1680. It is now the entrance to No. 33 Mark Lane, which is let as offices. It is a fine piece of work, executed by GRINLING GIBBONS, one of the first wood-carvers of his time, but, like all good things, has to be sought out, for it is comparatively hidden at the end of a court out of Mark Lane, in the City, and access to it has to be obtained through an archway, under Nos. 31 and 34, before you can approach near enough to see its beauties.

The mansion originally included Nos. 31 and 34, and the front and back arches to this archway through these premises contained some more of what is doubtless GIBBONS's work, being formed with broken pediments, and entablature supported in one case on fluted Corinthian columns, and all mouldings enriched and the spandrels carved. These arches were purchased on the report of



MARK LANE

Mr. PULLEN and Mr. CLARKE by the South Kensington Museum from Mr. PERY STANDISH, the owner of the property, when the front portion was pulled down and rebuilt in 1884, and they may be seen in the South Galleries of the exhibition buildings used for the Educational Museum of Building Construction and Machinery, an inappropriate place for a work of art; but Mr. CLARKE informs me he waits for a public demand for the study of such work before he can put them in their proper place in the museum. Shall we not raise the cry? Like the doorway, the carving to these arches was much choked with the paint of generations, but this was pickled, and the carving now stands out in all its sharpness.

Entering the passage through the doorway of No. 33, with the aid of a light can be seen paintings of heads in conventional shields on the raised panels of the old doors to the offices, now darkened with age, and still more with varnish.

The staircase at the end of the passage to the left is

good, and has alternate fluted and twisted balusters and carved spandrel ends to the treads.

In two of the offices there still exist good examples of enriched plaster ceilings, through which glazed screens have been ruthlessly cut.

At the back of the mansion, the tenants inform me, was originally a court-yard, with a fountain, foreign trees, and steps up to the different entrances; but now all is gone, and the space occupied by one-storey buildings used as offices, the only vestige of the old work being a good doorway, and an enriched cornice to the upper portion.

There are also said to have been two wrought-iron gates at the Mark Lane entrance, but no trace is left of these. Some also say that the house dates from ELIZABETH's time, and that the red-brick gauged work is merely a casing against the old.

A. H. BELCHER.

ARCHITECTURAL BOOKS.*

By HERBERT BATSFORD.

(Concluded from last week.)

ALTHOUGH it will be something of a departure from chronological order, I think it will be a convenient arrangement if I now deal with books illustrating the architecture of our own land and then with those illustrating the different countries of Europe, omitting altogether books dealing with the art of the primitive races of these islands. I think the place of honour is due to those of John Carter, the pioneer of the Gothic revival. They are entitled "Ancient Sculpture in England" and "Ancient Architecture in England," and were first published in 1780 and 1795 respectively, but the later editions have notes by John Britton, that grand archaeologist, who published upwards of fifty volumes devoted to the archaeology of his country. I will not weary you with a catalogue of the literature of the Gothic revival, but a few of the books which greatly influenced it must be mentioned in the order in which they appeared, and first must be reckoned the works of John Britton before alluded to. In 1804 he commenced his "Architectural Antiquities of Great Britain," and between 1814 and 1832 he published his celebrated illustrations of fourteen of our English cathedrals, a series of fourteen volumes which still remain the finest of their kind issued in any land. The difficulties he met with in obtaining permission to draw in some of these buildings are recounted with something of bitterness in his autobiography. Britton was ably seconded in his illustrations by the celebrated engraver Le Keux, whose name is found on so many of the fine engravings of architectural subjects published at this period. With these of Britton's should be added Wild's illustrations of Lincoln Cathedral, which he adopted, and the Durham and Carlisle Cathedrals of that charming draughtsman and archaeologist, Robert W. Billings. At the same time that Britton was placing before the public his splendid series of illustrations, that remarkable father of a yet more remarkable son, Pugin, was working upon more strictly architectural lines, and published in 1821 his "Specimens of Gothic Architecture," two volumes, which contains the first exact illustrations of English Gothic; in 1831 he published "Gothic Stone Ornaments," which is beautifully drawn on stone by J. D. Harding, and in the same year commenced his "Examples of Gothic Architecture." Of this the second volume, published about 1835, bears, jointly with his own, the name of his talented son Augustus Welby, the architectural genius of the century, of whom Mr. Eastlake wrote, "His name marks an epoch in the history of art which, while art exists at all, can never be forgotten." In 1836 appeared that bitter satire upon the architecture of the day, entitled "Contrasts," or a parallel between the noble edifices of the Middle Ages and corresponding buildings of the present, showing the present decay of taste, the appearance of which made him many enemies, and a few years afterwards he essayed to mollify them by the issue of a small brochure, under the title of "An Apology for 'Contrasts,'" which is very scarce indeed.

In quick succession followed his "True Principles of Gothic Architecture" and "An Apology for the Revival of Christian Architecture," with, in 1844, his remarkable book, considering the date of its production, the "Glossary of Ecclesiastical Ornament and Costume." I need hardly say that all these works of the Pugins, with others of less importance, which I need not mention, should be included in our library. Proceeding to notice further works upon ecclesiastical buildings before dealing with those more especially devoted to domestic, I would mention one which should have found an earlier place, Cottingham's large monograph on Henry VII.'s Chapel, West-

* A paper read before the Society of Architects on Tuesday, December 11, the president, Mr. E. J. Hamilton, in the chair.

minster, which is of great value for the study of Perpendicular work, notwithstanding the rough production of the drawings by lithography in its early days (1822). Soon after the appearance of the later works by Pugin came those well-known volumes of the Brandons, "Analysis of Gothic Architecture," two volumes, "Open Timber Roofs of the Middle Ages," in one volume, and "Views and Plans of Parish Churches." Almost simultaneously appeared Mr. Sharpe's magnificent folio "Architectural Parallels," illustrating the progress of ecclesiastical architecture in England and Wales through the twelfth and thirteenth centuries, of which Professor Roger Smith says:—"Here a certain number of Gothic abbey churches, chiefly those of Yorkshire, are anatomised, compared and contrasted in the most thorough and interesting manner, and the student cannot do better than turn to it constantly whilst making his way through Rickman's 'Gothic Architecture.'" A supplement to the "Parallels" was published, giving the mouldings of these abbey churches drawn full size. I will here briefly mention the "Seven Periods of English Architecture," the "Ornamentation of the Transitional Period," "Mouldings of the Six Periods," which he unhappily left incomplete, and his smaller book, "Window Tracery in England," all excellent books on their subjects.

Then close along followed Mr. Colling, who, I am happy to say, is still amongst us, with his beautifully-drawn works, "Gothic Ornaments," containing 200 plates of stone carving, with a few examples of Mediæval coloured decoration, and "Details of Gothic Architecture," two volumes, intended to further elucidate such features as were only partially developed in Brandon's "Analysis." These two works of Mr. Colling are, I think, unsurpassed by any illustrating English architecture, both for the amount of work put into them and the correctness and beauty of the drawings, which were mostly made on the spot by the author from his own measurements. I fear that he has never received the recognition due to him for their production, and I regret to add that he has derived no pecuniary benefit whatever from their publication.

In 1857 Messrs. Bowman & Crowther, the Manchester architects, published an important work, "Churches of the Middle Ages," being selected "Specimens of Early and Pointed Structures, with a few of the purest late Pointed Examples," two folio volumes, giving what may be termed a series of working drawings of examples of church construction in these different periods. To these I must add Wickes's highly artistic, yet correct, drawings, entitled "Spires and Towers of the Churches of England," "Churches of the Nene Valley," the drawings for which were made by Messrs. J. Johnson and W. H. Kersey, under the direction of Mr. Sharpe, by whom the accounts of the churches were written. Mr. James Neale's carefully-drawn monograph of the Abbey Church of St. Albans before its restoration and Mr. Gilbert Scott's most valuable "Essay on English Church Architecture" prior to the separation of England from the Roman obedience. Other minor works are Sir G. Gilbert Scott's "Rise and Development of Mediæval Architecture," Rickman's "Gothic Architecture," Wallcott's "Church and Conventional Arrangement," Paley's "Gothic Mouldings" and "Baptismal Fonts," Wollmann's "Examples of Ancient Pulpits," Bury's "Ecclesiastical Woodwork," Bloxam's "Principles of Gothic Architecture," Professor Willis's paper on the "Vaults of the Middle Ages."

Turning now to the works illustrating the domestic architecture of own country, and taking them in chronological order of the periods they illustrate, I must place first Britton's "Architectural Antiquities of Great Britain," already mentioned; next, Hudson, Turner and Parker's "Domestic Architecture of the Middle Ages"; Mr. F. T. Dollmann's "Analysis of Ancient Domestic Architecture," two volumes, containing 160 excellent plates, certainly a unique work illustrating domestic buildings down to the sixteenth century in a thoroughly practical manner; and Pugin's "Examples," three volumes, already referred to and which is too well known to need comment. Of half-timbered work some of the best examples are illustrated in Clayton's "Timber Edifices of England," a very scarce folio, and Habershon's "Half-timbered Houses of England." Nash's "Mansions of England in the Olden Time" needs but a passing mention; it is known to all in its original or smaller edition, and I need only say, get the former if you can. Richardson's "Studies from Old English Mansions," if not so widely known as it deserves, certainly for the architect for whom it was more particularly prepared and to whom it is more useful, contains a variety of details of all descriptions. Of a much later production, "Architecture of the Renaissance in England," by Mr. Gotch, I shall not express an opinion; most of you have, doubtless, some knowledge of it. I should add that two lesser works by Richardson, and "Details of Elizabethan Architecture" by Henry Shaw, are worthy of notice, and that, in my opinion, the whole of the volumes of the "Architectural Association Sketch Book" are of the utmost importance in a good architectural library, both on account of the large amount of English work illustrated in them, and for the variety and charm of the draughtsmanship.

They contain a large amount of excellent work not illustrated elsewhere, and include valuable details in wood and metal-work.

For illustrations of the later Renaissance and Classic revival in England the best works are the following:—Inigo Jones's "Designs for Public and Private Buildings," which includes most of his executed works; Clayton's "Large Drawings of the Churches of Sir Christopher Wren," which illustrate them all except his masterpiece, St. Paul's; "Vitruvius Britannicus," started by Colin Campbell and finished by Woolfe and Gandon, illustrating the public buildings and private mansions designed by Inigo Jones, Sir Christopher Wren, Sir J. Vanbrugh, and other celebrated architects of the time. Gibbs's "Book of Architecture," which includes illustrations of St. Martin's Church, and the "Works in Architecture, Decoration and Furniture" of those prolific architects, the Brothers Adam, of Adelphi fame, a rare work, consisting of beautiful engravings of the most important works carried out by them.

The earlier architecture of Scotland is most delightfully illustrated in Billings's "Baronial and Ecclesiastical Antiquities of Scotland," four volumes, which contain 250 engravings. For further illustration MacGibbon and Ross's very voluminous large octavo volumes on the "Castellated and Domestic Architecture of Scotland," and the sketch book of the Edinburgh Architectural Association should be consulted. Many of the Classic buildings erected in the eighteenth century will be found in "Vitruvius Scoticus," a bulky volume by William Adam, father of the celebrated brothers just mentioned.

I must not be guilty of "one more injustice to Ireland" by omitting to tell you that her ancient architecture has been well illustrated in the comprehensive work, "Notes on Irish Architecture," in two volumes, folio, by the Earl of Dunraven, but I need hardly add the subjects illustrated are rather archæological in their interest.

Dealing next with French architecture and commencing with the Gothic, as I have already dealt with the Romanesque period, we find an early English authority in John Sell Cotman, whose "Architectural Antiquities of Normandy," two volumes, published in 1822, vividly portrays, in a series of vigorous etchings, the beauties of Norman architecture. These were accompanied by historical notices by Dawson Turner. I may here mention that the elder Pugin published his "Architectural Antiquities of Normandy," with beautifully detailed plates, in 1828. A very complete book on this period of architecture, "L'Architecture Normande," by Ruprich-Robert has been issued. It illustrates in a most thorough manner architectural remains both in Normandy and England. But French Gothic architecture is insuperably associated with the name of M. Viollet-le-Duc, who in 1854 commenced the publication of his famous "Dictionnaire Raisonné," with its 3,500 illustrations drawn by his own hand. It may be remarked that the publication of this remarkable work came at a time when English architects were turning towards French Gothic, and its influence, together with that of his companion work the "Dictionnaire du Mobilier," greatly spread that taste for French Mediæval art which held its sway in this country for so many years, only to be followed by the introduction of French Renaissance, for which purpose "Sauvageot" and other works were already in existence.

But I am anticipating somewhat: other English books illustrating French Gothic rapidly followed and led to its general adaptation. Amongst the first of these I must name "Mediæval Architecture of France," by Henry Clutton, published as early as 1853, and Mr. Norman Shaw's "Sketches from the Continent" (1858), illustrating many of the French cathedrals, and the companion work, "Specimens of Mediæval Architecture," by Eden Nesfield, which appeared in 1862. These two works are well-known; yet I cannot refrain from quoting Mr. Eastlake's words, that "the skill, the delicacy of touch, the attention to perspective and the knowledge of detail which they exhibit is worthy of all praise." Then, in 1864, one of the most valuable volumes of masterly geometrical drawings and perspectives, "Specimens of Early French Architecture," by the late R. J. Johnson, which was much appreciated, and quickly went "out of print." In his preface the author says, "The examples have been selected to display that nobleness, simplicity and masculine vigour so strikingly characteristic of the period in France, and it is believed that those who are studying Christian architecture will find the results of a laboriously measured series of 'specimens' of the utmost value." In 1865 were published two volumes of photographs of 500 delightful sketches, made by the younger Pugin during his continental tours, between 1836 and 1847. These little sketches, whether representing in a most minute manner some continental building, or depicting, in a few lines, some detail of stone, wood, or metal, seem to present the object with a force and fulness quite out of proportion with the scale of the drawing. In 1870 William Burges published his "Architectural Drawings," a folio volume of plates, which represented in a bold manner some striking features of construction and early French details, mostly of the thirteenth

entury. This is the last English book devoted to French Gothic, and is in some respects the most remarkable.

There is another fine book by M. Jules Gailhabaud, whose name I have already mentioned, in five volumes, entitled *L'Architecture du V. au XVII. Siècle, et les Arts qui en dépendent*, and much of it is devoted to illustrating the French cathedrals. Two works devoted to French Gothic architecture are Adams's "Recueil de Sculptures Gothiques" and Baudot's "La Sculpture Française," a beautiful work issued some four years since. I am anxious to draw your attention to a work issued some three years ago by Gelis-Didot & Laffillé, entitled "La Peinture Décorative en France," which gives the most perfect series of reproductions of ecclesiastical mural decorations ever issued, from water-colour drawings specially made. I should like to see a similar work illustrating English examples in so fitting a manner.

German Gothic architecture is well illustrated in Förster's *Monuments de l'Architecture*, &c., eight volumes, quarto, and I must here speak of two favourite books which give examples of both French and German Gothic; the first is by one of the greatest archæologists we have ever had, T. H. King. The title of the book so well explains its scope that I give it in full, "The Study Book of Mediæval Architecture and Art, being a series of working drawings of the principal monuments of the Middle Ages, whereof the plans, sections and details are drawn to uniform scales." In the four volumes we have mostly drawings of some hundred different churches, and examples of metal-work, stained-glass, &c. The other is Verdier et Cattois's "Architecture Civile et Domestique," published in 1857, which contains over 100 engravings, illustrating many charming examples of Gothic domestic buildings in Italy and France.

For Italian Gothic architecture we must go to Ruskin's "Stones of Venice," and his "Examples of the Architecture of Venice," Street's "Gothic Architecture in North Italy," second edition published in 1874; Dr. Rowand Anderson's "Examples of the Municipal and Street Architecture of France and Italy," Gruner's "Terra-cotta Architecture of North Italy," which has coloured plates, published in 1867; and Rohault de Fleury's "Toscane au Moyen Age," two volumes, folio, of most delightful drawings in the Mediæval spirit, published in Paris in 1873.

Spanish Gothic has not been well illustrated in an architectural manner, but we get a comprehensive review of it in Street's "Gothic Architecture in Spain," an octavo, published in 1865. Many exceedingly artistic and picturesque drawings, including illustrations of the cathedrals, are given in "España Artística y Monumental," three volumes, folio, published between 1842 and 1850. Notwithstanding that Spain cannot be regarded as one of the wealthiest of nations, it is refreshing to know that for many years past the Government has contributed towards publishing a suitable record of the architectural and art wealth of the country. But for want of support the publication had to be discontinued before the work they had set themselves to do was accomplished. The result of their support is seen in six very large folio volumes, which are on the table, from which you will be able to judge of the grandeur both of the work itself and the monuments it illustrates.

We now reach the Renaissance period, and we naturally must in the first place take those books which illustrate the beautiful examples of the land of its birth, and I think I may first name Palladio's "Architecture," the best of the English translations of which is that by Leoni, as it gives a good number of Palladio's pure designs. Then I will remind you of those two remarkable works, the result of years of labour and study, that make us freely translate and paraphrase the celebrated "Wren epitaph" and say of the authors, "If you seek a monument of them, look at their works." Letarouilly's "Edifices de Rome Moderne," three volumes, folio, containing 335 engraved plates of measured drawings of the famous palaces and churches. It is said the author devoted thirty years of unceasing labour to this monumental work; still his energy was far from being exhausted, for he spent the remaining years of his life in preparing drawings for a rich monograph in two volumes, on the Vatican and St. Peter's, entitled "Le Vatican et la Basilique de Saint-Pierre de Rome." It is much to be regretted that the author did not live to witness the publication of these volumes some twelve years since. You are all, I am sure, aware of the great aid that photography has been to us in representing architecture, and in some recent years the excellent methods of permanent printed reproductions, showing detail perfectly, have led to many works being published that could not have been otherwise. One of these, entitled "Baudenkmäler Roms," is a volume, I fear, but little known, although it should certainly be found in every library which possesses a copy of Letarouilly's "Rome." It contains one hundred photographic plates, consisting of views of façades, &c., and is intended to extra illustrate Letarouilly's drawings.

This combination of photographs and measured drawings should, I think, make the perfect architectural book. There is a magnificent volume of engravings by Volpato, illustrating

Raphael's arabesques of the Vatican, a copy of which is here, and will well repay inspection. Herr Schutz's comprehensive series of 330 plates, reproduced from photographs, entitled "Die Renaissance in Italien," thoroughly illustrates the Renaissance architecture, sculpture and ornament of Italy. There remains Nicolai's "Das Ornament der italienischen Kunst," consisting of 100 phototypes, illustrating the delicate architectural ornament of the fifteenth century. It is a very fine and useful work. There remains now to be mentioned Cicognara's "Le Fabriche di Venezia," which, in a series of 257 line engravings, illustrates Venetian architecture, chiefly of the Renaissance period; it is regarded as the companion to Letarouilly, though it is to be regretted that the quality of the drawings are not of equal merit. Signor Ongania has recently given us a charming series of 100 views, reproduced in photogravure, in his "Streets and Canals in Venice," a copy of which is here for your inspection. Other works that cannot be omitted from my list are Gruner's "Fresco Decorations of the Churches and Palaces of Italy," containing fifty-six minute engravings, which is most valuable for Italian interiors and has some coloured plates. The same author's "Specimens of Ornamental Art," another large folio issued in 1850, containing fifty plates mostly in colour, depicting to a large scale various Italian ceilings, decorations and ornaments. "Architectural Art in Italy and Spain," by Waring and Macquoid, large folio, published in 1850, and containing a good collection of Italian palatial architecture and details. It is interesting to note that they were pioneers in drawing attention to some beauties of the Renaissance architecture of Spain.

The next books which call for our attention are those illustrating the Renaissance in France, and a most reliable series of illustrations is to be found in a work no doubt familiar to many of you, Sauvageot's "Palais, Châteaux et Maisons de France," four volumes, small folio. In its series of nearly 300 engraved plates the work gives monographs of French châteaux illustrating various phases of the later Renaissance. For further details the library should possess César Daly's "Motifs Historiques d'Architecture et de Sculpture." The first series, in two volumes, folio, has 200 engraved plates of exterior architectural details and ornaments, and the second series, also in two volumes, contains 250 similar plates, illustrating interior decorations. A few of these plates are printed in colours. But side by side with these must be placed Victor Petit's splendid series of 100 folio plates, drawn on stone by the author, illustrating the châteaux of the Loire Valley. Issued in Paris in 1861, it will ever remain one of the best productions of its time. A very interesting work, illustrating the interior decoration and woodwork of the early Renaissance, is Rouyer's "Décorations Intérieures de la Renaissance," published a few years since, and invaluable books to refer to for information and illustrations concerning every branch of French decorative art are Viollet-le-Duc's "Dictionnaire du Mobilier Français," six volumes, octavo, and Havard's "Dictionnaire de l'Ameublement et de Décoration," four volumes, quarto. The first of these deals exhaustively with French Gothic art, and the second is rich in its treatment of the later periods.

There are various monographs on special châteaux, notably one on the "Château de Blois," illustrated by permanent photographs and coloured plates, and Pfnor's "Palais de Fontainebleau," forming, with its later volume illustrating the rich interior, three volumes, folio.

The works in Belgian, Dutch and German Renaissance must now be briefly considered, and here the first place must be given to that surprising testimony of the power of one indefatigable worker to make the art of his country known. I refer to the volumes entitled "Documents classés de l'Art dans les Pays-Bas," published by M. Van Ysendyck, an architect living in Brussels. Here are to be found 700 folio plates, chiefly collotypes, and, as one of his critics truly said, doing for the art of the Low Countries what Viollet-le-Duc had done for the Mediæval art of France. I suppose that we must say that further credit is due to the author's energy in issuing his work without the aid of a publisher. Yet even with this extraordinary series of illustrations we cannot dispense with Proert's "Sketches in Flanders and Germany," fifty beautiful drawings most delicately reproduced by lithography, and Louis Haghe's three folios of sketches in Belgium and Germany, also reproduced by lithography, which works picturesquely and vividly bring before us the quaint architectural beauties, both exterior and interior, to be found in these countries. Then there is a capital collection of 300 phototypes, known to many of you, I think, entitled Fritsch's "Denkmäler deutscher Baukunst." These well illustrate the architecture in the old towns of Germany. The last book to mention is "La Renaissance en Belgique et en Hollande." It comprises nearly 500 lithographed drawings, chiefly of architectural details, and is most suggestive, and well supplements Fritsch's volumes, which depict but views and façades.

The buildings of the Spanish Renaissance are illustrated in the Government publication I have previously spoken of, in Sir M. Digby Wyatt's volume of clever impressionist sketches

entitled "An Architect's Note-book in Spain," and in Mr. A. N. Prentice's recent volume "Renaissance Architecture and Ornament in Spain," for which I am pleased to say the author has received his meed of praise.

As I have already mentioned the principal authorities on the interior decoration of the various historic periods, there remain but few others for me to particularise on this and some special arts as applied to architecture. For examples of historic ornament our library must possess Owen Jones's "Grammar of Ornament," the original folio edition of which was published in 1856, and a smaller edition, the plates being reduced, in 1865. To this may well be added the two series of Racinet's "L'Ornement polychrome," which give some 3,500 fresh examples. I would certainly include César Daly's "Décorations intérieures peintes," two volumes, folio. The examples shown in this book are all printed in colours and are copies of decorations which were carried out in Paris about fifteen years since; no work has ever appeared which sets before us so truthfully and artistically complete schemes of colour decoration. The books on furniture and woodwork which I would put on our library shelves in addition to those previously mentioned are Marshall's "Specimens of Antique Carved Furniture and Woodwork;" Small's "Scottish Woodwork of the Sixteenth and Seventeenth Centuries;" Shaw's "Specimens of Ancient Furniture;" and for the later styles, Heaton's "Furniture and Decoration in England during the Eighteenth Century," a work which gives 200 selected plates of reproductions from the scarce works by Sheraton, Hepplewhite, Chippendale, the Brothers Adam, Pergolesi and others. Copies of the original books can be added later if the library is so disposed.

The volumes which I should place in the library on constructive metal-work are Mr. Starkie Gardner's little handbook—and I hope to see a more important work from him on this art, to which he is so devoted; Heftner Alteneck's two volumes on the metal-work of the Middle Ages and Renaissance, entitled "Eisenwerke-Ornamentik der Schmiedekunst des Mittelalters und der Renaissance;" and D. J. Ebbett's "Decorative Wrought Ironwork of the Seventeenth and Eighteenth Centuries."

For examples of monuments from the Celtic times to the eighteenth century, we need only have Brindley and Weatherley's "Ancient Sepulchral Monuments," which has 600 specimens selected from all authorities, and to help us in the designing of stained-glass we need place in the library Winston's "Hints on Glass-Painting," two volumes, octavo, published in 1867; Diver's "Works of Early Masters," two volumes, folio, containing many coloured plates of Belgian, Dutch and English examples; and above all Mr. Westlake's most painstaking and scholarly work on the "History of Design in Stained-Glass," the fourth and concluding volume of which has just appeared.

Now I think you will agree with me that, with few exceptions, we do not want to study modern continental architecture except for suggestions of construction and planning. The books which I consider worth a place in our library are Daly's "L'Architecture privée aux XIX. siècle," first and second series, in six volumes, folio, containing 450 engraved plates, ennobling the principal mansions, hotels, shops, restaurants, &c., erected in Paris and the suburbs during the reign of Napoleon III., and under the control of Baron Haussmann; a later book in four volumes, folio, by M. Narjoux, entitled "Paris: Monuments élevés par la Ville," the seventy-eight monographs in which describe town halls, markets, schools, hospitals, work-houses, abattoirs, morgues, &c.; then the elaborate monograph illustrating M. Garnier's magnificent building, the new Opera House at Paris, in two volumes, large folio and quarto text, and the equally extravagantly produced works on the Opera House and the Palace of Justice at Vienna. But when we come to consider modern architecture in England we have to confess that there is no book illustrating it—something to be deplored when we know the admirable work which has been designed by our leading architects, and the value of it for study by all. Mr. Mountford, in the course of his recent interesting address to the Architectural Association, said, "The one and only way to learn how to design is by the constant study of existing work, I say existing work advisedly, because it is my belief that the study of modern work is as necessary, and more useful, perhaps, than that of old work. Of course we must study old work, that goes without saying, but by all means study modern buildings as well." For illustrations of this modern work we have to turn to the architectural journals. You know them well, but let me just mention them, and the year of their first publication. *The Builder* was commenced in 1843, *The Building News* in 1857, *The Architect* in 1869 and *The British Architect* in 1874; and with sets of these Journals should be included a set of the "Transactions of the Royal Institute of British Architects," the later volumes of which are splendidly produced. In these five sets we shall not only find modern

work illustrated, but, to quote Professor Roger Smith's words "Papers on and illustrations of almost every subject that you can think of. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded." To make the library complete must be added, when they can be met with, sets of the "Sketch Books" issued by private societies, all illustrating examples of ancient architecture, and many interesting details of wood and metal-work. The chief of these are "The Architectural Association Sketch Book," of which, since 1867, twenty-four volumes have been issued, containing over 1,700 plates; "The Spring Gardens Sketch Book," commenced in 1866 at the suggestion of Sir G. Gilbert Scott and Mr. J. T. Micklethwaite, and finished in 1891, the result being eight large folio volumes, containing nearly 600 plates, naturally mostly illustrating Gothic work. Not more than seventy-two copies of any volume were published. Then there is "The Abbey Square Sketch Book," initiated by Mr. John Douglas, at Chester, and of which three volumes have appeared; and lastly "The Edinburgh Architectural Association Sketch Book," of which five volumes have been issued.

There are many points which I have not been able to touch upon, and the subject has not been treated as it deserves, partly on account of want of time on my part in preparing my notes, due to the very limited leisure I have been able to allow myself, and further, owing to the short period given me in which to present my paper to you. But I trust I have shown you that upon the history of architecture a noble series of volumes exists, and although many of the authors mentioned are foreign, I think we, as Englishmen, may justly pride ourselves not only on the part our countrymen have played in forming the history of art, but especially so for the valuable works they have produced illustrating the architecture of the past, especially of their own land.

I thank you for the kind attention you have given to my paper, and should time permit I shall be pleased to listen to any criticisms you may make upon it. If I have made any of you feel an increased interest for architectural books, my paper will indeed have not been read in vain.

THE MODERN THEATRE OF THE CONTINENT.

By EDWIN O. SACHS.

(Continued from page 381.)

THE BUILDING.

THE theatres of our country are built to fulfil the prosy requirements of the investors or ambitious actors, who cater for the pleasure and sensation seekers of a people practically devoid of any feeling for architecture. They are essentially utilitarian structures, with a little art thrown in occasionally for advertisement. The modern theatre of every class on the Continent is always intended to figure as a fitting home of the ever popular invigorating and revered dramatic art of nations who have a *bona fide* interest in architecture and who wish to see their hobby and pride housed in appropriate surroundings. Thus it comes that our English theatres, as a rule, simply require architects who are clever planners, good constructionists and business men. It is a minor consideration if there is art feeling in the architecture, if he have an art ghost, or simply relies on some fibrous plaster manufacturer for his so-called art. If anything, it is more important that he should have the talents and facilities of a financial agent or company promoter. Abroad, on the contrary, theatres must have architects who are really architects in the best sense, and who, if anything, attach the greatest importance to the art side of their profession. They are allowed to have ghosts, but these phantoms must only belong to the species that revels in specifications, sanitation, warming and ventilation, stresses and strains. The theatre architect must have real interest in the essentially technical side of his work, but as an architect, and not as a mere financial agent, or as an engineer. He must be conversant with the art of planning, but not necessarily be expert in the details of stage machinery, of electric lighting, &c. In short, practical artists have the jobs, not what we would term surveyor-architects. This is only as it should be, too, for work where questions of finance and time need seldom influence the erection.

A modern continental theatre, to my mind, is the most difficult object an architect can have to tackle, and requires every atom of that what may be described as the true spirit of an architect; a maximum amount of real beauty is required, including the most careful blending of architecture, sculpture and painting, and this where all the practical requirements are

generally against the realisation of perfection, and where the requirements are more complicated, more numerous and more essentially technical than in any other class of work.

The architects who have been able to satisfactorily complete a modern theatre abroad have necessarily at once ranked among the first, if not as leaders, in their profession. Let me mention names—the deceased Gottfried Semper in Germany, Baron Hasenauer in Austria, Von Ihyl in Hungary, Basile in Italy, and then there are among the living Garnier of Paris, Anderberg of Stockholm, Schroeter of St. Petersburg, Messrs. Fellner & Helmer of Vienna, and Seeling of Berlin. Absolute perfection has scarcely been reached, but something very near it. Maybe we cannot hear in some parts of the auditorium of the beautiful Vienna Hofburg Theatre, or maybe we complain of the heavy interior decoration of the so-practically arranged Buda-Pesth Opera House; but taken as a whole, and as a whole it is that architects must learn to judge, there are few buildings, old or new, that can be said to surpass the great continental theatres of to-day. The pessimist or revolutionists of Mr. Pite's school may say differently, but I am unfortunately an admirer of this age of architectural variation and adaptation, in which, to my mind, an immense amount of originality and true art is shown. I am fully convinced that the good examples of the work of this period which are bound to live will not be considered the mere copies so many of the discontented are afraid of. Of course there is many an eyesore among the modern theatres abroad, and many that do not fulfil the requirements of their owners; but in what class of building, and at what period have there not been some failures?—though we do not like to think so when gaping at some monstrosity labelled old, very old, say even real Greek or real Roman. Where the conception, the practical arrangement and the architectural rendering are expressive, serviceable and pleasing to a cultured majority, perfection is not very far off. I should be pleased to hear why Messrs. Semper and Hasenauer's Hofburg Theatre, of which illustrations are shown, is not very near perfection, and what more, full of originality.

General.

Taken generally, continental theatres are oblong in plan. In some cases the front is rounded, showing the outline of the auditorium, and in some instances there are wings on either side of the main block. The audience is always above street level, and the building is always distinctly divided into two parts—the so-called front and back of the house. As the modern continental stage requires great height, the grouping of the block generally shows this part of the building taken up separately as the prominent feature. There is seldom any attempt nowadays to put the whole of the building under one roof. Continental theatres all show symmetrical planning and ample dimensions, and there are few to my knowledge that appear structurally badly built. The buildings have all been put up under watchful permanent authorities, who are guided by well-considered regulations and have ample powers. They have not been subject to the fads and fancies of ever-changing popularly-elected bodies. They have also nearly all been erected by men who have a horror of running the risk of a repetition of the Ring Theatre fire. Architects have but seldom opposed safety legislation or tried to avoid its requirements. The so-called front of the house is generally distinctly palatial in feeling, whilst the back has always a thoroughly utilitarian look about it. I would here point out that I hold many of the municipal and subscription theatres to be too palatial and too luxurious for the audiences they are intended to hold. I do not want to pick out any one town or country, but I must really say that there are some very luxurious playhouses where the ill-dressed, ill-kempt and often vulgar audience looks entirely out of place. Why give such audiences surroundings that do not suit them? Surely a building can be simple and yet beautiful. Architects should not forget that a badly attired crowd can spoil their finest colour study, whilst even Hungarian and Polish magnates in full national attire will lose much of their splendour in inappropriate though perhaps quite classical surroundings.

Site.

There are few modern theatres abroad that do not stand perfectly isolated; public squares are the favourite sites. Isolation is undoubtedly necessary where the maximum safety against the risks of panic and fire is desired, but I would point out that an audience can be already well cared for if only two sides of the block face thoroughfares. Symmetrical planning is to my mind the first necessity for a theatre that is intended to be a safe one. The position of all passages and staircases on outside walls is the second essential, and the possibility of approach to every part of the building from outside is the third. Now all this is only possible where at least two sides of the block are perfectly free. To have the front of the site as well as the two sides looking on the thoroughfares is of course a great advantage, but to have the main front, one side and the back open would be far worse than to have only the two sides free. Remember the plans of the Ring Theatre, the Exeter Theatre,

and other scenes of fearful catastrophes. Legislators abroad require complete isolation, but I will not go so far for London. Our own by-laws, however, only say, "That is not quite sufficient." The two sides of the building as seen when facing the stage must at least be free from end to end, and that generally means more than half the boundary. I am not going to dwell on the many technical advantages of isolation so ably described in Mr. Woodrow's paper. The risk of panics through accidents in neighbouring premises, the advantages of cleanliness, and the facilities for the working of the firemen in case of an emergency, are points which should not be underrated. The safety of human life is a major interest, and the safety of property of minor consideration. As soon as the audience are out of the theatre, treat the building according to the custom of the country. It is not usual in this country to protect neighbours from one another to any appreciable extent, or to prevent a large risk that catches fire from being entirely gutted by enforcing such protective measures as those required by continental fire Acts. This may be wrong or right; I hold it to be wrong, but in any case, why make an exception to theatre property? In a town where timber storage is allowed next to valuable warehouses, why protect, say, a public house from the fire risk of a neighbouring stage? Abroad, of course, all this is different. The requirements for the isolation of theatres are no more stringent than the various measures in force for other classes of property.

The chief advantages of placing a theatre in an open square are the greater facilities for the approach and distribution of crowds, and easier manœuvring for the fire brigade in case of need. Where buildings are really public institutions it greatly adds to their dignity to be well situated. By-the-by, speaking of the position of theatres abroad, I would observe the great importance the owners of private theatres attach to first-class and conspicuous sites as an advertisement for their enterprise. They will go to any length to have an open site.

Approaches, Entrances and Exits.

Great care is taken on the Continent to facilitate the approach of the audience. That part of the audience which arrives by carriage is nearly always able to enter the building under cover, without being disturbed by the inquisitive or having to feel the effects of inclement weather. The patrons who arrive on foot generally have numerous entrances from at least two sides of the building. Great care is taken abroad to avoid draughts by having double or even treble sets of swing doors. Excepting in the grandest houses, all playgoers must pass the main vestibule, where the box-office is situated, and this also refers to the visitors who take unnumbered seats. Speaking generally, there are few seats abroad for which one cannot book in advance, and hence the number of tickets sold on the night of the performance is comparatively small. There are also very few unnumbered seats, so that the first come, first served system of procuring seats at the last moment does not allow the same scope to the energetic as in this country. If a queue has to be formed at all of an evening for tickets, the expectant of all classes generally pass the same counter to ask for whatever kind of seat they may require. Two counters to the same box-office are an exception, and separate box-offices for different parts of the house are only very rarely found. Where a queue has to be formed the crowd is generally well cared for and put under cover in an outer lobby or passage, and much attention is given to the arrangement of barriers so that there need be no unnecessary fatigue.

The symmetrical planning of the Continent allows for the nominal division of the building into "The Right of the House" and "The Left of the House," as seen when facing the stage. Tickets are issued for the right and left of the auditorium, and all passages and staircases will be found to be labelled on this principle. All passages and staircases can be used freely, and the visitor naturally takes the route which leads him quickest into his seat. Besides facilitating the finding of seats, the audience thus gets to know the nearest exits at their disposal in case of an emergency. The system common in London, which only allows for one approach to each tier, whatever the number of exits may be, is radically wrong as far as the safety of the audience is concerned, although no doubt the theatre lessee will be able to run his house with a smaller staff of ticket collectors this way. Though all staircases and passages are approached from the main vestibule, they all have separate exits leading direct into the open without the vestibule having to be passed. In this way but few of the audience would pass the vestibule in case of a panic. By-the-by, clear planning is favoured abroad as distinct from intricate and tricky planning, and this even at the cost of much valuable space. It is considered all-important that the dullest and most excited persons should be able to remember the route by which they reached their seats.

Passages.

One of the chief features of continental planning is the broad passages and corridors, and the fact that with few exceptions these passages run round the two sides and back of

the auditorium. The continental theatre-goer has generally to give up his wraps before taking his seat, and it is a favourite plan to provide long counters off the passages behind which there is ample storage room. The counters should, however, be recessed so that they do not obstruct the passages. I would here remark that the storage of hats and coats is very important for the safety of the audience. A wrap or a stick dropped during a panic may cause the first fatal stumble. Though it is difficult to regulate this matter, the prohibition has been enforced in several continental countries, and where ample cloak-room accommodation has been provided, the custom has generally become very popular. As to the actual storage of the apparel, the bin system is the best. As to the cloak-room tickets, the plan of allowing a bin for each seat and then giving the bins the same numbers as the seats has been found very practical. Speaking of cloak-room accommodation, I will at once add that the ladies are by no means so particular abroad as to their retiring-rooms as in this country, and there is no objection to their being in a conspicuous position. The position of lavatories off main passages which we would consider faulty is hence also quite *en règle* abroad.

As you will see from these plans, the passages generally have direct light, and are well ventilated. This is essential for the audience, to my mind. By opening or breaking the windows on the passage, the noxious gas and smoke which has been known to frequently find its way from a burning stage to the open doors of the auditorium can escape. A crowd will always feel safer as soon as it is near the open air, and in case of the lights going out the window openings even on a dark night—more especially if there are some lamps in the streets or courtyards without—will give some light, and with it more assurance. Here I would at once suggest that where passages or staircases look on to the open a few strong lights outside in no way connected with the service of the theatre will form the best kind of emergency lighting that can be provided. Of course, there must not then be any blinds or shutters.

Staircases.

The grand staircase, the great feature of the old continental theatre, is gradually disappearing abroad, and where we yet find it its *raison d'être* is generally partly lost through there being quite sufficient staircase accommodation provided independent of its existence. The grand staircase is recognised as dangerous for the rapid exit of the crowd, as its pretension and architectural treatment generally necessitates arranging it in broad flights. Flights of staircases which allow more than four persons to ascend abreast create, as has been often explained, a danger to fall or to stumble. Of course there is the make-shift of a light iron railing running up the centre of a broad flight and thus affording a hold, but I am afraid these iron bars will generally spoil the design of any staircase. At Copenhagen I constantly came across this class of railing, as the theatre regulations require the possibility of a hold for every person ascending stairs. They always looked atrocious.

The continental architect of to-day has three systems for the arrangement of his staircase. I will call them the central system, the radial system and the corner system. The former allows of a grand central staircase, generally without direct light, or at the most a top light and hence without the possibility of natural ventilation. On either side of this grand staircase the minor stairs are grouped. The Stockholm Theatre, as you will see, and the Frankfurt Opera House are examples of this system. The radial system allows of the arrangement of the staircases in a row, concentric with a back wall of the auditorium. The staircases to the first tier are then generally on either flank and are frequently treated as minor grand staircases. The Dresden Opera House and the Odessa Municipal Theatre are examples of two variations of this system—the one with direct lighting, and the other without. The Lessing Theatre at Berlin is an example of the former system: as you will see, the staircases have simply been grouped on either side of the main vestibule, so as to have direct light. There is no grand staircase, and the stairs leading to the best seats only show a slightly superior architectural treatment. Staircases in the same way as passages should always have windows looking into the open. The advantages of the outside emergency lighting, as well as the other points to which I have referred when speaking of passages, hold good as regards the advantages of having staircases on outside walls.

Speaking from experience, I consider that the more persons in sight of one another in case of an emergency, the better the behaviour of the individual. I would hence suggest that where possible stairs should be so arranged as to allow a maximum view. I do not approve of the building up of surrounding walls of staircases in the way that limits the view. Being penned in and descending into a well, if I may call it so, creates a feeling of uneasiness.

As an architect, I certainly much regret the disappearance of the grand staircase. This feature lends itself particularly well to an elaborate treatment. I hold it should be retained at any cost in the court and municipal theatres, which, as I

explained, frequently serve as assembly halls. There must, however, be sufficient staircase accommodation independent of the grand staircase, and no doubt some day a skilful architect will find some pleasing way of overcoming the dangers of broad flights. The radial system of staircases is rapidly gaining ground abroad, and I consider it the best for the quick distribution of an audience. It would, however, be difficult indeed to combine this system with the arrangement of a grand staircase. You will see in the plans of the new St. Petersburg Opera House an attempt is, however, already being made to combine the two.

Foyers, Crush-rooms.

Perhaps the feature of a modern continental theatre is its foyer or crush-room. We find what I will call the "hall foyer," the "group of rooms" foyer and the "promenade" foyer. The first is generally a spacious rectangular hall situated over the main vestibule. It serves as the assembly-room for the patrons of the better seats, who stand about and chat during the long entr'actes mostly allowed abroad. The hall is often used for the receptions I spoke of and frequently also for concerts. No concert would, however, be given at the same time as the performance on the stage, as the staircase and passage accommodation would not be sufficient. Where there are groups of rooms the smaller ones are, as a rule, provided with chairs and lounges arranged drawing-room fashion, whilst the larger one is used as a kind of miniature promenade, the visitors walking round in a circle. This becomes very monotonous. Foyers arranged on these lines cannot well be used for concerts, but small receptions can of course be held in them. The Schwerin Theatre affords an example of the large "hall" foyer. The Buda-Pesth Opera House shows a set of crush-rooms. The "promenade" foyer is, to my mind, the most satisfactory one; it best fulfils the requirements of those who wish to easily stretch their limbs and meet their friends between the acts. A stroll will greatly refresh the playgoer, especially if he is attending a lengthy Wagner opera or a Shakespearian play. The stroll must, however, not be a monotonous one. There must be a change of scene. The long narrow foyers of the Paris or Vienna opera houses are already very satisfactory, but the curved promenades of the Dresden Opera House, the Vienna Hofburg Theatre or the Odessa Theatre stand first. The curved foyer goes hand in hand with the radial staircase system I spoke of. Most of the curved foyers have a roomy lobby at either end, where one can step aside for conversation or to watch the scene without creating a block. Speaking of the scene, I would here remark in the countries I am speaking of the audience unfortunately is not as a rule "dressed" to see a play, not even the patrons of the best part of the house. This should be taken into consideration when decorating the foyers.

The foyers abroad nearly all have balconies or terraces connected with them, and these are much used in the summer. Doors from the foyers generally lead directly on to them, and the absence of any lobby has unfortunately caused many a chill. I consider the advantage of being able to step out into the open very great, and this not only for the refreshment of the audience, but also in case of emergencies. Great care should, however, be taken to prevent draughts. In court theatres there is often a small central balcony or open loggia. I spoke of royalty using their playhouses for ceremonies. It is necessary to have some suitable, prominent point from which any demonstration outside the building can be duly acknowledged.

I must now refer to the refreshment-rooms or bars in connection with the crush-rooms. They are of the most harmless kind, and would even meet with Mrs. Ormiston Chant's full approval, as the contractor need generally only keep a good store of lemon squash, ice creams and cake to fully satisfy his customers. The liquor license for the refreshment-room exists, but it is scarcely made use of. Light German beer can be had, but its consumption is comparatively small. The bar, as a rule, is generally only a kind of provisional table at the end of the crush-room, around which perhaps a few tables and chairs are arranged, as in a confectioner's shop. There is one thing I would here remark—I do not remember ever having seen a refreshment served in the auditorium. If refreshment is wanted the visitor is expected to leave his seat.

Auditorium.

The principal feature of a modern auditorium abroad is the absence of any boxes in our sense. The balcony arrangement has almost become universal, and though there are nominally boxes which allow parties of four, six, or more persons to form a group for themselves, they are not shut-off pigeon-hole fashion as formerly. The ante-room for the box is also fast disappearing. The only boxes, in our sense, are generally the large open ones on either side of the proscenium opening, in what I will term the great proscenium frame. These are generally reserved for dignitaries or distinguished strangers. The other so-called boxes are simply formed by dividing up the balconies with low

partitions and giving each division its own door. A compromise arrangement will be found in Semper's work. The partitions between his boxes are carried up, but are so cut away as to prevent the disadvantages of the pigeon-hole system without completely destroying all privacy. I show an illustration taken from one of the working drawings of the Dresden Opera House.

The large boxes on either side of the proscenium to which I have just referred would, in the case of a court theatre, be reserved for royalty, but the court would also have a large open central box on the first tier. The side boxes are used for private visits and the central box on State occasions only. These grand court boxes are frequently most curious mechanical contrivances, which can be enlarged or made smaller at will. They generally cut through two tiers and are covered with a baldachin. I might here remark that the auditorium is frequently turned into a ball-room abroad by putting in a temporary parquet floor on tressels level with the first tier. At times this floor is even extended right over the stage, which is then decorated as a kind of bower. Small courts give their name to the theatre if the palaces do not afford sufficient accommodation. As a rule the theatre is, however, only the scene of so-called subscription balls for charitable purposes, royalty gracing the fête with its presence and serving as an attraction. But few architects have been able to design an auditorium so that the temporary floor does not make it appear a architectural monstrosity. The only one, in fact, that I remember looking well as a ball-room is in the old Berlin Opera House. I remember a subscription ball there when old Emperor William was celebrating his ninetieth birthday. The auditorium really looked better with the temporary floor, and the stage was a perfect piece of floral decoration.

When speaking of the arrangement of the auditorium abroad must point out the ample seating and gangway accommodation provided, and the great care that is always now taken to give every two or three rows of seats its own door. Herr Seeling, I believe, shows the best example of safe seating in the Halle Theatre. Here I must just allude to the advantages of school children learning to leave rooms on the "follow-my-leader" principle. Given a well-planned theatre, the inductive exit of the audience on the lines they learnt as children would do much to insure safety. I remember a notable demonstration of the advantages of follow-my-leader given by the late chief officer of the Berlin fire brigade at one of the theatres in his city.

He had the right half of the auditorium packed full with schoolmen; he then went into a box and gave a signal for them to stampede. None of the men had been on the same ground before, but they were all used to leaving their dormitories smartly and running down the staircases at their fire stations in good order. Well, gentlemen, they were out before one could literally say "Jack Robinson." It just took eighteen seconds to clear out about four or five hundred men. The same experiment was tried with 1,400 school children at the Forms Theatre, and they were out of the auditorium in forty seconds.

Referring to the construction of the auditorium, I would only point out that there is no such excellent cantilever work abroad as is to be found in our Palace of Varieties. The latest development of iron and steel construction abroad shows the surrounding wall of the auditorium entirely of girders and plates. This is on account of the large number of flues and ducts that have to be found room for in continental theatres. If you will examine the work in the drawings of the Hofburg Theatre you will find an example of this system. Of course, an auditorium of this construction ever does get well alight means the immediate collapse of the whole structure.

As to the architectural treatment of the auditorium, the ceilings are no longer designed so as to appear to be resting on nothing, but are visibly carried, preferably by Caryatides. The heavy columns in the French theatres are things of the past; almost invisible steel pencil columns without any architectural treatment are generally used where supports are necessary. The decorator and upholsterer are no longer permitted to use the stereotype red and gold. Blues and rich yellows are finding favour in the upholstery, and white picked out with gold in the walls and cornices. The ceilings are kept quite light, preferably white, picked out to match the upholstery. As to the furniture, the tip-up seat with a small side arm has almost become universal. It is well padded in the better parts of the house, but a bent-wood is a favourite for the cheaper seats. As in buildings abroad are only licensed to hold a certain number of seats and this condition is very stringently enforced, benches which can be crowded are of no use to the manager even in the cheap parts of his building. As I said, hats and coats are mostly left outside, so that no provision need be made for these. As to the numbering of seats it is always in plain block letters, and even numbers to the left and right of the house respectively.

(To be concluded.)

IRISH ART.

A LECTURE on Irish art, as seen in Irish crosses, was delivered by the Rev. Denis Murphy, under the auspices of the local branch of the Archæological Society, in the Town Hall, Waterford. The lecturer said he would ask two questions which he would strive to answer satisfactorily, for there might be some amongst them, he would say without any breach of charity, who might not be acquainted with these matters, having other and more important duties of life which kept them fast in their ordinary avocations. He would ask, first of all, Is there such a thing as Irish art? The answer was, There is such a thing as Irish art; as well defined as Grecian, Persian, Egyptian or Moorish art, or the art of any other nation in the world. He claimed for Ireland that it was the cradle and the source of the beautiful work of which he would show them specimens that evening. There were Celts in Wales, Celts in Cornwall, in Brittany and in France. He would ask what has Wales, Brittany or Cornwall done for this special style of art? He would go no further than Scotland. What they have done in this way they have borrowed and taken from Ireland. With regard to Scotland it would be a rash statement if he had not the authority of Dr. Anderson, curator of the Edinburgh Museum, for the assertion. Dr. Anderson says that the source and cradle of this art is Ireland and Ireland alone and other authors, like Weston, in later times, state positively and without any kind of doubt that Ireland is the cradle and source of this art. This Irish art may be coveted by others but not originated by them. Gothic art is produced by leaf-work. There was nothing of that kind in Irish work, although they had nature exuberant in many ways. But, instead of that, they had serpents introduced in the most curious fashion, with all manner of creeping things and human beings, sometimes twisted and gnarled together in a most curious and extraordinary way. If ever leaf-work is seen, except, perhaps, the shamrock, it is Gothic, it is post-Norman—anything but Irish work. The second characteristic of this work is its amazing variety. The first specimen of this kind of work he would show them would be the title of the Book of Kells. It was called the Book of Kells because it was, most probably, written by St. Columba, who lived in Iona a great part of his life. It is the most beautiful page of the most beautiful book in the world. They would see it to-night without its colours, but it was as beautiful and as perfect as when it was first written in the year 600 A.D. How the human eye, unaided, could have introduced such amazing and such perfection of minuteness was to him and others a great mystery. There was no simple twist or turn that had a flaw; no failure of any curve or line that should be parallel. Mr. Weston counted on one of the pages 158 lines within the space of 1 inch. This extraordinary beauty, delicacy and perfection of details is singular and peculiar, and it belongs singularly and peculiarly to Irish art. Illustrations of nearly a hundred Irish crosses were exhibited.

ARCHITECTURE AND INDUSTRIALISM.

A MEETING of the Northern Architectural Association was held on the 12th inst. in the Art Gallery Lecture Room, Newcastle, when a paper by Mr. H. Barnes on "The Economies of Architecture" was read. The paper stated there were two distinct periods, each marked by a well-defined growth, perfection and dissolution. They were the Classic and the Gothic. What were the conditions which, in the fifth century B.C., and in the thirteenth century A.D., gave opportunity and provided scope for the highest expressions of architecture the world had yet seen? And why did they not exert their power to-day? The hope of any true growth had almost died out, and they had nearly persuaded themselves that the *summum bonum* of all architecture was to rigidly adhere to and successfully imitate some bygone style. One of the answers given was that the existing methods of construction had been played out. The writer thought they could hardly accept that. Along certain lines they had attained great perfection, but there was nothing to show that it was impossible for them to develop on other lines. A second answer was that the public controlled art and that the public taste was depraved. That was far from a final solution. The Athenian architecture reached its perfection under the most democratic and complete control of affairs by any people the world had yet seen. But even admitting that the public taste was depraved, how was it that this depravity was considered sufficient explanation for a state of architecture to which the last days of the Roman Empire alone could offer a parallel? The paper proceeded to draw attention to the circumstances which evoked in a high degree the sentiment of nationality in the height of the classic period of Greece, and the deep religious feeling in the best days of the Gothic period. With this was contrasted the different state of feeling produced by the keen industrial competition of to-day. The writer concluded from these historic examples that the

only hope for architecture was the revival of her two great inspirers—social and religious feeling. It was necessary that industry should be so administered that it should cease to be a source of national discord and become a fruitful source of social and religious unity. How this was to be done was another story, and not part of his paper.

THE RUINS OF NIFFER.

THE United States Minister in Constantinople, reporting recently to the Department of State on the exploration of the ruins of Niffer, near ancient Babylon, mentions that the work is undertaken at the cost of an association in Philadelphia, which was formed in 1888 and is called the Babylonian Exploration Fund. Some 200 Arabs are constantly employed under the direction of Dr. Peters, of the University of Philadelphia, and the Minister says that "in the number of tablets, brick, inscribed vases and in the value of the cuneiform texts found, this American enterprise rivals, if it does not excel, the explorations of Layard at Nineveh and Rassam's excavations at Abu Habba." Dr. Hilprich, also of the University of Pennsylvania, who was originally connected with the exploration, remains in Constantinople at the request of the Turkish Government, to translate the inscriptions and arrange the tablets and other objects excavated. Many tons of these, including tablets, vases, inscribed brick and sarcophagi, have arrived at the Constantinople Museum, and the Sultan has promised that Pennsylvania shall receive one of all duplicate antiques. So far, 20,000 tablets of clay and stone have been discovered, on which are inscribed promises to pay, deeds, contracts and other records of public and private events. "About 150 Hebrew, Arabic and Syrian inscribed bowls have been dug up. These are more than all the museums in the world possessed before. They have also found hundreds of Babylonian seal cylinders. About 1,000 vases of alabaster, marble and other stone have been discovered, with votive offerings of lapis-lazuli, magnesite and agate. Many hundred vases, toys, weapons, instruments and household objects in iron, bronze and clay were discovered." The Temple of Bél is being dug out, and the Minister says that when finished it will be the first Temple of Bél ever systematically excavated. The excavation was carried down 42 feet below the foundation of the immense temple.

THE GHIZEH MUSEUM.

SPECIAL measures have been adopted to diminish the danger of fire occurring in the Ghizeh Museum. The Public Works and Police Departments have for a long time been considering what steps were best for this purpose, and the result is the completion of abundant water supply, with a special canal and a new system of hydrants round the building, and a complete system of electrical communication from all parts of the building to the fire-brigade station and Ghizeh waterworks. The museum authorities have removed all perishable objects into the Selamlık, which is fireproof, and this portion of the building is now separated from the remainder by iron doors. These precautions, together with certain changes in the composition of the special fire brigade attached to the museum will minimise as far as possible the damage to the priceless collection from fire. In March next the Government will have to select from amongst the numerous plans expected to be sent in by European and American architects the one most suitable for a new building to be erected on a site already appropriated within easy access from the city, and Egyptologists may then feel assured that the Government spares neither pains nor money for the preservation of its collection of antiquities and for affording facility for their study by scientists.

THE ROMAN VILLA AT DARENTH.

AS was anticipated, the exploration at the site of the settlements at Darenth has demonstrated that the buildings extend far beyond the apparent limits shown by the first diggings. The area to be enclosed for excavation will be doubled in size, as the foundations have been traced for some distance beyond the present fence. The feature that excites most interest is the elaborate system of warming by heated air, and in several places the arrangement of flues is in a perfect condition. On the east side is a small room about 12 feet by 7 feet, in which the rows of piles, each formed of tiles laid one upon another, are clearly defined. Upon these piles the floor of the room rested, and the hot air from the adjacent furnace was introduced into the space beneath the floor and circulating round the piles thoroughly warmed the room. Not only was the floor warmed by the heat beneath, but the flues ran up the walls also, perhaps to warm an upper floor, as well as to keep

the walls of the lower rooms warm. Like many other Roman villas in Britain, this one was provided with glazed windows and one large pane has been found in addition to many fragments. The most imposing room yet uncovered is the large bath, on the west side of the house. It is some 3 feet below the general level of the other rooms, and measured originally about 50 feet long by about 20 feet in width, with a descent of cemented steps at one end. Although no pavements of ornamental design have yet been found, the villa was evidently the property of some man of fairly good means, from the painting of the walls and the solidity as well as the size of the structure. A vast quantity of animal bones have been turned out by the men, including a number of worked deer-horn objects, apparently picks, handles of tools, &c.; but the only object that can be called a work of art is a small bronze plate with the design filled in with coloured enamel, which may well be of native manufacture.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

AT the last meeting of this Association, the president (Mr. Wm. Henman) in the chair, and present Messrs. Bidlake Harrison, Scruton, Edwards, Percival, Prichard, H. Buckland and others, after the election of new members, Mr. F. R. Farrow, F.R.I.B.A., of London, read a paper on "Preparation for the Examinations held by the Royal Institute of British Architects." He said for the future all desirous of attaining the distinction of an associate of the Institute would have to pass through three progressive stages of examination, of which he gave details, together with hints as to the best books to study. The final examination of the new course had not yet been held, so that they were rather in the dark as to what form it would take, but one thing was certain, that it would be much more difficult than the qualifying examination in the past, as the intermediate examination must be considered about equivalent to that; and he advised students to make the most of what Mr. Bidlake and the Birmingham Association had to teach them, and said he did not doubt that if candidates would take advantage of these and other facilities provided for the education of architects in Birmingham, they would have no difficulty in getting through. Thanks were voted to Mr. Farrow for his paper.

GENERAL.

The Italian Government have offered a prize of 120 sterling for the best essay on the technique of painting frescoes, encaustic painting, distemper and oil-painting, with suggestions for the preservation of ancient paintings. The essays may be written in English, and foreigners may compete. Manuscripts are to be delivered to the Minister of Public Education not later than June 30 next. The essays will be adjudged by a special commission assisted by scientific experts.

A Banquet is to be offered in Paris to M. Puvion de Chavannes, to signalise his attainment of his seventieth birthday.

An Exhibition has been held in the Public Library, Cologne of maps and other works relating to Mercator, who died at Duisburg in December 1594.

Mr. B. P. Shires, in concluding a course of lectures on architecture at Plymouth, referred to the late Mr. Gribble as a local architect, and his two principal works, the Oratory and the Armada Memorial.

The Earl of Derby intends to renew the monuments and brasses of the Stanley family in Ormskirk Church.

Mr. Wm. Taylor, president, at the meeting of the Royal Scottish Society of Arts, has called attention to the apathy which was displayed in connection with their business meetings. For himself and the other office-bearers, he said, he had to thank the Society for the confidence bestowed upon them, but when he mentioned that the office-bearers met and elected themselves it would show that the interest taken in the business by the Fellows was not great.

An Exhibition of work by members of the Sketching Club of the Manchester School of Art has taken place in that city. The pictures are nearly all in water-colour and are mainly landscape.

Mr. Ernest Runtz is deserving the utmost credit for the very effective manner in which, as architect, he has carried out in the short period of three months the rebuilding of the Pavilion Theatre, Whitechapel Road, E. The house is spacious and well planned, while the decorations are fully equal to some of the best of the West End theatres. The façade, a beautifully designed structure built by Messrs. Doulton & Co., of terracotta, is quite dwarfed in comparison with the handsome spacious interior, and the convenient appointments for visitors and artists, and there is no possibility of a complaint of insufficiency of exits being raised, as these are abundantly provided.

The Architect.

THE WEEK.

MANCHESTER has lost one of its most prominent architects by the death of Mr. JAMES MURGATROYD. To his firm—MILLS & MURGATROYD—many large works were entrusted, the most important being probably the Royal Exchange, which forms a prominent feature in Manchester and is known to all visitors. Mr. MURGATROYD was an active member of the committee of the Jubilee Exhibition and, we believe, was mainly responsible for the arrangement of the architectural section. He was also of great service in aiding in the arrangements for the technical school, and to obtain information he visited several of the technical schools on the Continent. Mr. MURGATROYD possessed much energy and business capacity, and there is no doubt he was one of the most efficient citizens in Manchester.

It is to be hoped we have heard the last of the Kensington Court case, which is not creditable to the tact of the London County Council. It was known when the proceedings were commenced there was uncertainty whether the building abutting on two streets should have the height determined by the wider or the narrower of the two, and it had been decided to apply to Parliament for authority to have the height calculated according to the wider street. But because the parties connected with the houses in question had, according to their legal rights, adopted the height of Kensington as a standard instead of the narrower entrance to Kensington Court, no effort was left untried by the Council to put them to inconvenience. The amount of ratepayers' money expended to bolster up a principle that the Council had doomed to extinction has been large and the outlay has only served to show with what ease despotic acts can be executed. On Saturday the case, which had been remitted to the magistrate at the West London Police Court, came up for settlement, and he was asked to impose substantial penalties for sixty-seven days, namely, from December 31, 1893, to March 7, 1894. Mr. CURTIS BENNETT, in giving his decision, called attention to the new Act consolidating the Building Acts, which had been obtained by the County Council since the commencement of the proceedings. He said the Act really dealt with the question raised in the case. The Judges had agreed that it was a hard law, and Parliament had apparently come to the same conclusion, for in the Act it was provided that, where the building was on a corner plot and abutted on two streets, the height should be regulated by the wider of the streets. That made the law clear, and removed the hardship. He thought, under the circumstances, that a penalty of 3s. a day would be adequate. It was a case in which some arrangement might be come to between the owner and the County Council. The owner of the buildings was ordered to pay 10*l.* 1*s.* with five guineas costs. The punishment is not as grievous as the County Council desired, but it is difficult to see what real advantage the inhabitants of the Metropolis have gained by the imposition of such a penalty or by the expensive proceedings which have had so insignificant a result.

THE parties in the building case, BRITTON v. VEALE, that was heard a few days ago in the Queen's Bench Division, do not appear to have profited by departing from the established custom, and allowing an official referee to decide on their differences instead of the architect for the building. Mr. VEALE, the defendant, owned land at Lfracombe, and recently erected an hotel on his property at a cost of about 10,985*l.* The original contract was for 14,75*l.*, but as the works were progressing the advantages of increased accommodation were recognised and additions were undertaken. The owner was not satisfied when the building was completed, as he believed there were considerable omissions from the contract. Accordingly the plaintiffs, Messrs. BRITTON & Co., in January found it necessary to bring an action to recover a balance of 1,087*l.* The case was referred, and the amount was reduced to 552*l.* in the report of the official referee. Mr. VEALE objected to the report, mainly on the ground that the referee had refused

to enter into any matters which might have been brought before the architect and had been neglected, which, it was said, shut out most of the defence, though, in truth, both parties had tacitly agreed to discard the architect, neither of them having appealed to him. Mr. VEALE's counsel urged that, as in fact the parties had not appealed to the architect, it was for the referee to enter into the matters in dispute and decide them—the omissions, for instance, which were serious—instead of which he had virtually avoided determining them, and had thus, in fact, excluded the employer from his defence. Because the employer had not appealed to the architect, was he to pay for work not done? There were manifest omissions—for instance, of concrete in the foundations, of drains, of water-closets, &c. For all these the employer was to pay, merely because he had not appealed to the architect and got his decision. The defence had, in truth, never been gone into, and he asked the Court, therefore, to send the case back to the referee. Baron POLLOCK said the architect had power to decide all points in dispute between the parties who, however, "gave him the go-by," and neither of them resorted to him. The case, therefore, was sent to the official referee, who entered into all the matters in dispute and heard evidence, only taking the architect's estimates as to prices and values. There appeared to be no ground for disturbing or sending back the report, and the application must be refused with costs. With that judgment Mr. Justice GRANTHAM concurred. An application for leave to appeal to the higher Court was refused. In settling his next building contract, we hope Mr. VEALE will remember the lesson he has received, for he will find it is economical to allow his architect to determine all claims.

THERE can be no doubt that a great many of the tall chimneys throughout the country are a source of danger. In the last gale, while jerry-built houses defied the storm, many factory chimneys succumbed. Apparently there is no authority to look after structures of the kind, and there is no code of rules which is accepted as applicable to them. The defects are sometimes so notorious, the coroners cannot be silent about them. On Monday, in Keighley, at an inquest on a victim who was crushed by the fall of a mill chimney which was partly attached to a building, and was of the same section throughout, the coroner remarked that a fixed side is a danger to a chimney. That was demonstrated in a very thorough investigation that was made at Cleckheaton or Heckmondwike, and Mr. WAUGH distinctly said that a fixed side was a danger in that case. The coroner could not well appear to be one-sided, and he said it was a very wide question, and very possibly the gale was of such violence that it might have happened in any event. The jury found that death had occurred by misadventure.

AT Leeds on the same day another inquest was held. The chimney which was the cause of the accident was described as always rocking when there was a great wind. The owner considered that probably the chimney was rocked by the wind, and that before it could get back to its original position it was met by another gust of wind, which broke it. If the chimney had collapsed at the foundations the loss of life and damage to property in the neighbourhood would have been very serious. A chimney, he considered, might rock and still be safe. There are, however, many degrees of rocking, and it is time that an examination of existing structures by specialists should be enforced throughout the country.

In preparing their architects' and builders' diaries and date-indicating blotting-pads for the New Year, Messrs. HUDSON & KEARNS have wisely acted on the principle of letting well enough alone. Their productions have acquired so much success during several years, innovations might not be advantageous, for the use of the diaries has become part of an established system in well regulated offices, and nobody cares to abandon forms with which they have become familiar and the utility of which is uncontroverted. We therefore recommend Messrs. HUDSON & KEARNS's aids in business to our readers with satisfaction, for it is well to find that one class of annuals has not degenerated.

ARABESQUES AND GROTESQUES.

THE distinction between ornament made up of arabesque and of grotesque elements is not universally accepted. In many cases a *motif* that would be described by some as arabesque would to others exemplify grotesque. LITTRÉ, who always endeavoured to be precise, defined grotesques in the first place as "arabesques imitated from those which were found in ancient edifices buried underground," and, secondly, as "figures which excite laughter by going beyond nature, or which counterfeit nature in a bizarre manner." The meaning he gives for arabesque is "ornament which is made up by the interlacing of leaves, flowers and animals." Both words arose out of associations, and are consequently inadequate. Eastern ornament, with its interlaced and lifeless conventions, might give rise to "arabesque," although the word would inadequately describe Renaissance arabesque in which animal life is freely introduced. In the same way the Roman and Greco-Roman ornament, which was discovered in grottos or buried chambers, might be confounded with one variety of it, and the grotesque be accepted as the bizarre.

It would be an advantage if the two words, in common with many used in speaking and writing about art, could be set aside and supplanted by others which would be more rational. They are inconvenient in giving rise to erroneous notions. For it is an error to suppose that the Eastern or Arab treatment of ornament corresponded with Roman or Renaissance, and it is, moreover, wrong to assume that bizarre or unnatural figures are the genuine elements of interlaced ornament.

That figures which were not imitated from anything existing in the universe have been used as long as men have been employing ornament is unquestionable, and it was from Roman rather than from Egyptian or Assyrian examples that modern types of grotesque were derived. It is evident, however, that the best judges in Rome were at first opposed to the exercise of invention in that way. There was nothing which to HORACE appeared more absurd than one of those decorative compounds. Who could refrain from laughter, he asks, on seeing a representation of a mermaid or of a figure made up of a human head, the neck of a horse, and winged with a variety of feathers? He expressed the good sense of the cultivated Romans. VITRUVIUS, who was apparently a contemporary of HORACE, was no less emphatic in condemning the practice of introducing mongrel figures. In his seventh book he says:—"I cannot tell by what caprice it is that artists no longer follow the rule of the ancients, to take for their models only real things, for now they paint on the walls extravagant monsters instead of veritable and regular figures. For columns we have bundles of reeds, with contorted heads, or plants with the leaves awry and twisted into volutes. We see candelabra which sustain little villas, with branches of trees on which figures are seated. Others have branches from which flowers spring, with small figures issuing from the buds, some with human faces, while others have heads of animals. All these things are contrary to nature, but while they are approved there is no chance for anything that is good in art. For how can reeds be able to sustain the weight of a roof, or a candelabrum carry a villa and so on? But nobody rebukes such impertinences or asks whether what is represented is a possibility? For my part, I maintain that a painting should not be esteemed unless it represents the truth, besides being rational in the composition, while everything is excluded that would shock good sense."

VITRUVIUS and HORACE applied severe rules of logic to decoration. It was not perceived by them that art does not need to be as correct as mathematics. They ignored the advantages which grotesque figures possessed in allowing an almost infinite variety of contours.

On the other hand, many antique Romans must have found a relief from stern care when they gazed on decoration which might be supposed to have been painted by children for children. The numerous wall-paintings which are found in Pompeii, where amorini are depicted as engaged in chariot races, festivals and ordinary occupations, or in which pigmies are the actors, the incidents with baccantes and centaurs, the comic figures and caricatures, are a revelation of lighter moods in Roman breasts which it was necessary to gratify. They were disciplined until they were hard

and cruel, but nature could not be withheld from asserting its rights. The man who designed the scene in the studio of the portrait-painter that was discovered in the Casa Carolina must have calculated on the prevalence of a sense of humour in Pompeii. Critics like VITRUVIUS could not esteem it, but that sense was not an unmanly quality, and a moralist would be more satisfied when he saw men enjoying ludicrous pictures than affecting an admiration for the tragic *Medea* or the *Perseus and Andromeda*, or the *Achilles and Briseis*.

RAPHAEL, who was the earliest to revive the imitation of the Roman figures, realised their suitability to serve as a foil to his great pictures which were intended to appear as warrants for the claims of the Popes. The variety of scales, the absence of relation between the figures, the general playfulness of the groups of men, children and animals, and the apparent absence of all purpose but that of pleasing the simplest people, which can be seen in the decorative work of the Loggie of the Vatican, combine to form as wonderful a contrast as could well be devised to the biblical scenes above them. We may grant that the quantity of elements in the decoration is in excess and that more unpainted parts would give repose, but an objection of that kind does not diminish the value of the arabesques. We can only guess at the character of the work in the Baths of TITUS which inspired RAPHAEL, and in his experiment he may not have made sufficient allowance for the smallness of the galleries when compared with the halls of the ancient building.

The extraordinary variety of the subjects introduced in the Loggie is as surprising as the execution. We can hardly imagine that RAPHAEL prepared a schedule of the different figures that were to be employed in the panels, and it would be no less difficult for one of his assistants to make the attempt. We see a heterogeneous collection of objects, and although there is more or less correspondence between the panels in the disposition—that is to say, large figures, cameos and gems will occupy similar positions—there is no relation between those which are introduced on the majority of panels. Admirers of the Roman school will not, we hope, be offended when we say that the Loggie recall NICHOLAS BOTTOM'S account of his dream, "I have had a dream—past the wit of man to say what dream it was. Man is but an ass if he go about to expound this dream." There is no profit in attempting to analyse what RAPHAEL has collected. If we can find pleasure in the variety, that should be enough to explain the reasons for their adoption. They form, as it were, a dream-fugue, and it is sufficient if they combine in leaving a delightful memory in the mind.

It would be an error to believe that RAPHAEL'S decoration can be imitated by representing subjects in such a way as to make them appear as a fortuitous collection. That course would be taken as no more than a parody. On the other hand, a deliberate effort to treat arabesque according to the usual canons of art rarely succeeds. The arabesque frieze which WILHELM VON KAULBACH introduced as subordinate to his great paintings in the Berlin Museum is now admired by everybody. The idea is ingenious, for it suggests the development of man, which is the object of the larger works. But in the frieze the characters are children and animals that are combined in a sort of running ornament. The whole is humouristic but subtle. Visitors object to the frieze because they consider it is more difficult to interpret than the series of paintings which are crowded with figures, for the frieze can only be suggestive of children's games which adults do not always comprehend, while every one of the paintings expresses its meaning to all. KAULBACH'S frieze is, however, as perfect as we can ever expect from a historical painter. Men of his eminence do readily lay aside their lofty manner. Their efforts will correspond with GOLDSMITH'S description of what JOHNSON would do if he attempted to write fables—the fishes would all talk like whales.

If we take it for granted that arabesque should be a representation of something that, while delicate, graceful and pleasing, does not suggest too much deliberation, it must be confessed that very few ancient or modern examples exist which will serve as models. The paintings by MM. GUFFENS and SWERTZ, which we reproduced several years ago, are of the same species as KAULBACH'S. Children appear as representatives of the different regions of the

lobe, but the humour consists in their acting exactly as their seniors would do under similar circumstances. If the faces could be made to appear older and the contours were lightly altered of the nude figures, the scenes would become representations of the lives of men and women in Europe, Asia, Africa and America. There is no suggestion of childishness anywhere, and without that quality there is no true arabesque. RAPHAEL proved by his single figures in the Farnesina how much could be done in making children types of great powers without ceasing to be natural, and it must always be regretted that the world is not enriched by compositions from his hand in which several of them could appear. He was the only great master who appears to have been competent to undertake the painting of arabesques, or the simple was to him as easily produced as the sublime. It was probably owing to the difficulty of employing natural forms that so many chimeras were introduced in the composition of arabesque. The criticism to which a frieze like KAULBACH's would be subjected would have no avail of centaurs, sphinxes, syrens, dryads, fauns and winged genii were liberally introduced. A piece of decoration in which they were employed could not be judged by the canons that are applicable to paintings from the life. It is possible to obtain with the aid of imaginary figures a variety of lines which could only be gained with the human figure by subjecting it to processes of distortion. Beside, when humanity is imitated, it is not easy to bring the composition into subordination to more important works of a similar class. There are, for instance, figures in the panels of the Loggia which are as finished in detail as any of the sculptural characters above them, which form RAPHAEL'S "Bible." It must be allowed that the copies of cameos, gems, vessels, armour, trophies, &c., on the panels are compensation for the elaborateness of the human figures and subdue their prominence; but something else is needed to bring the ornamentation of the panels into the objection that is needed.

With figures that are only creations of the fancy, the lightest treatment is allowable. It was probably from seeing painted decoration which did not suggest high relief that PETRONIUS applied the term *compendiariam* to designate the character of the painting of his time. Painting, according to the satirist, had arrived at a state of decadence, for the audacity of the Egyptians had caused the art to become only an abridgment of itself. In other words, the figures were made almost as flat and symbolic as the hieroglyphics of Egypt, and that sort of treatment PETRONIUS could not understand. But his words are a testimony that in the time of NERO the principles of decoration were more rational than is commonly supposed.

In Pompeii, in imperial palaces, in the Vatican and elsewhere the style of arabesques and grotesques is of less importance than their signification. When used as the decoration of an architectural work, are they not expressive of a revolt against an excess of seriousness? The spirit which was exhibited in the Roman catacombs at a time of persecution, when most peaceful Pagan scenes were presented to the gaze of neophytes, which was exhibited in Gothic churches when flowers and birds were introduced and the whole officialism of religion was ridiculed by caricatures on stone that were more galling than any seen in Pompeii, still survives. It asserted itself lately in Paris, not only when pleasing subjects were introduced in some of the panels of the new Hôtel de Ville, but when artists who were established "comic designers" were commissioned to paint scenes in the styles that were familiar to them. In England we are supposed to take our pleasures sadly, and whenever a chance is offered, committees and councils will prescribe that public buildings must be embellished with pictures of the grimmest subjects that can be discovered in local or general histories. But can anyone believe there would be so much indifference about the decay of the rescues in the Houses of Parliament if they depicted scenes that could excite some pleasure, instead of executions, expulsions, exilings, partings and burials? If we must have tragedy let it at least be accompanied by other work that will suggest it has been fleeting in its effects.

Mr. Robert Woolfenden, of the firm of Messrs. Woolfenden, Thompson & Co., has joined the head office board of the London and Lancashire Fire Insurance Company at Liverpool.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the ordinary meeting of the Institute of Architects (Mr. Penrose, president, in the chair) the death was announced of Mr. H. A. K. Gribble; also of Mr. W. G. Coward, of New South Wales, killed in a railway accident.

Mr. WOODWARD alluded to the loss of Mr. Gribble, and expressed a wish that a message of condolence should be sent to his family.

The PRESIDENT announced the results of the recent examinations, and also announced Mr. W. E. P. Crompton as the Ashpitel prizeman.

Mr. BANISTER FLETCHER then read a paper on

The London Building Act, 1894.

Mr. Fletcher said the promoters of the Act, the County Council, had modified the original draft to meet the wishes of the public as put forward by the Institute of Architects. Definitions were stumbling-blocks. Lawyers shirked clear definitions, and in interpreting Acts, laymen had to fight these indefinite expressions in the Law Courts. Mr. Fletcher found fault with minor details of the Act, but commended its general stipulations. He called attention to the permissive clauses giving latitude to the County Council to select and vary rules under special circumstances, but he objected to such permissive powers. In criticising the regulations in regard of structural details he dealt among other matters with brestrummers, projections, areas, roofs, party structures, chambers, one-storey buildings, chimneys, flues and shafts, hollow walls, recesses and openings, hoardings, sheds, dwelling-houses, lantern lights and windows, yard spaces, &c.

Professor T. ROGER SMITH considered that the Act made no radical changes. The changes regarded rather minutiae and details. If in some cases the new Act might prove troublesome, it would be found to have cleared many difficulties away. The district surveyor's work was lightened by being enabled to secure that the spirit of the law was carried out rather than having to enforce the letter of the law. The relaxation from certain restrictions allowed architects to use their discretion in introducing architectural features that contributed picturesque to buildings.

Mr. H. H. COLLINS commended the new Act, but found fault with some of the minor details, and objected that there was no definition of the terms "habitable room in a basement" and "working class," and that the word "length" should have been "width," and *vice versa*.

Mr. JOHN SLATER praised the new Act. On one point he disagreed with Mr. Fletcher, as he thought the permissive powers under the Act were very valuable.

Dr. LONGSTAFF said strong arguments had been brought forward both for and against the permissive powers in the Act, but he believed in the necessity of permissive powers.

A vote of thanks, on the motion of Mr. C. Fowler, seconded by Mr. Blashill, was passed to Mr. Fletcher for his paper.

EMOTIONAL ARCHITECTURE AS COMPARED WITH CLASSICAL.*

(Concluded from last week.)

WHEN, therefore, turning from this our contemplation we compare the outworking of the vital processes of nature with the so-called creative activity of the average man of education and culture, we wonder at the disparity, we seek its cause. When, after having with joy observed the quality of identity and singleness that nature imparts to her offspring, when with aroused expectancy, with a glowing sense of the richness, fulness and variety that might and should come from the man's brain with the impulse of nature's fecundity flowing through it, we seek—we are amazed to find in this man's work no such thing. When we, in place of a fertile unity which we had hoped for, come suddenly upon miscellany and barrenness, we are deeply mortified, we are rudely shocked.

We are dismayed at this. That man, nature's highest product, should alone have gone awry, that with remarkable perversity he should have strayed; that for the simple and obvious he should substitute the factitious, the artificial.

The cause needs not a long searching, it is near at hand. It lies precisely in that much-glorified, much-abused word, "education."

To my view no word in the entire vocabulary of the English language contains so much of pathos, so much of tragedy, as this one pitiful word, "education," for it typifies a fundamental perversity of the human soul, a wilful blindness of the mind, a poverty of the heart.

For one brain that education has stimulated and strengthened, it has malformed, stupefied and discouraged

* A paper read by Mr. Louis H. Sullivan at the Convention of the American Institute of Architects.

thousands. Only the strongest, only the masterful can dominate it and return to the ownership of their souls. For it is education's crime that it has removed us from nature. As tender children it took us harshly away with stern words, and the sweet face of our natural mother has faded in the unspeakable past, whence it regards us at times, dimly and flittingly, causing in us uneasy and disturbing emotion.

And thus it is through a brutish and mean system of guidance, through the density of atmosphere that we have breathed, that we are not what our successors may easily become, a race filled with spiritual riches in addition to vast material wealth.

That in place of a happy people, open-eyed children of nature teaming with beautiful impulses, we are a people lost in darkness, groping under a sooty and lurid sky sinister with clouds that shut out the sunshine and the clear blue heavens. Yet the murky materialism—the fierce objectivity, the fanatical selfishness—of this dark age of ours, in this sense the darkest of all dark ages, is so prodigious, so grotesque, so monstrous, that in its very self it contains the elements of change; from its own intensity, its own excess, its complex striving, it predetermines the golden age of the world.

The human mind in all countries having gone to the uttermost limit of its own capacity, flushed with its conquests, haughty after its self-assertion upon emerging from the prior dark age, is now nearing a new phase, a phase inherent in the nature and destiny of things. The human mind, like the silkworm oppressed with the fulness of its own accumulation, has spun about itself gradually and slowly a cocoon that at last has shut out the light of the world from which it drew the substance of its thread. But this darkness has produced the chrysalis, and we within the darkness feel the beginning of our throes. The inevitable change, after centuries of preparation, is about to begin.

Human development, through a series of vast attractions and perturbations, has now arrived at a materialism so profound, so exalted, as to prove the fittest basis for a coming era of spiritual splendour. To foresee this necessity, consider but a moment the richness of our heritage from the past, its orderly sequence, its uplifting wave of power, its conservation of force.

Think of the Hindoo, with folded hands, soaring in contemplation thousands of years ago—think of what he has left to us. Think of the Hebrew man coming out of Ur, of the Chaldees, to find for us the One Great Spirit. Think of the sombre Egyptians, those giants who struggled so grimly with fate—think of the stability they have given to us. Think of the stars of Israel singing in the morning's dawn. Think of the lonely man of Nazareth breathing a spirit of gentleness of which the world had never heard before. Think of the delicately objective Greeks, lovers of the physical, accurate thinkers, the worshippers of beauty. Think that in them the Orient, sleeping, was born anew. Think of the Goth, and with him the birth of emotion as we know it. Think of modern science which has taught us not to fear. Think of modern music, arising in glory as the heart took wings—a new thing under the sun. Think deeply of the French Revolution and democracy—the utterance of freedom, the beginning of the individual man. Think now of our own age with its machinery, its steam power, its means of communication, its annihilation of distance. Think of the humanitarianism of our day. Think, as we stand here now, in a new land, a promised land that at last is ours, think how passionately latent, how marvellous to contemplate is America, our country. Think that here destiny has decreed there shall be enacted the final part in the drama of man's emancipation, the redemption of his soul.

Think of these things—think of what they signify, of what they promise for us, and think then that as architects it peculiarly behoves us to review our own special past, to forecast our future, to realise somewhat our present status.

Summoned to answer before an enlightened judgment-seat, how shall we now give other, alas! than a wretched accounting of our stewardship? How shall we excuse our sterility? We surely need to inquire, for we must need explain the emaciation of our art in the midst of plenty, its weakness in the midst of strength, its beggarly poverty in the midst of abundance.

By what glamour or speciousness of words shall we persuade a wrathful judgment toward kindness? How can our vapid record be made to plead for us?

Shall we summon the clear-eyed intellectual Greek or the emotional and introspective Goth to bear witness that we stand as ambassadors in their names? We would surely be repudiated.

Shall we call to the fateful Egyptian or the dashing, polished Assyrian? One would scorn us, the other would flout us.

Who are we, then, what are we, and how shall we explain our sinister condition, our mere existence?

Shall we claim second cousinship to Europe, or must we, before we can ourselves behold the truth, so far abase our heads as to acknowledge that we of this great and glorious ending of the nineteenth century have not a characteristic nobility in our

art, that we are merely lineal descendants of the original bastards and indiscretions of architecture?

Or, still seeking excuses in our *fin-de-siècle* pocket, shall we plead in the language of myth that our art, like Brunehilde, lies sleeping; that she awaits a son of nature, one without fear, to penetrate the wall of flame, to lift her helmet's vizor?

Dreading the storm, shall we seek shelter under the spreading plea that poets are born, not made; that if nature for all these centuries has not brought forth a great master-spirit in the architectural art, it must be for very good reasons of her own, for reasons definitely interwrought with the beneficence of her own rhythmical movements. That with her endless fecundity there must be a profoundly significant reason for this barrenness.

Or, perhaps, shall we simply say that men have now turned to other gods, that they have forgotten the ancient deities?

That there has arisen in our land a new king who knows not Joseph; that he has set over us taskmasters to afflict us with burdens?

All these pleadings may be true, yet after all they do not explain why we make easy things very difficult, why we employ artificial instead of natural processes, why we walk backward instead of forward, why we see cross-eyed instead of straight-eyed, why we turn our minds inside out instead of letting them alone; they do not explain why we are so vulgarly self-conscious, so pitifully bashful, so awkward in our art, so explanatory, so uncertain that we know anything at all or are anybody in particular, so characterless, so insipid, so utterly without savour. They do not explain why the intellectual and emotional phases of the architectural mind do precisely the wrong thing when the right thing is now quite as attainable as ever.

No. I pretend to advocate the real, the true cause of my generation, of my art. I do not wish to abase them except in so far as he who loveth chasteneth. I know that the secret of our weakness lies not only in our plethoric dyspepsia, in our lack of desire, in our deficiency of gumption and moral courage, but that it lies primarily in the utterly purposeless education we have received.

I know that the architectural schools teach a certain art or method of study in which one is made partly familiar with the objective aspects and forms of architecture. I know that this, as far as it goes, is conscientiously and thoroughly done. But I also know that it is doubtful, in my mind, if one student in a thousand emerges from his school possessed of a fine conception of what architecture really is in form, in spirit and in truth; and I say this is not primarily the student's fault. I know that before entering his architectural school he has passed through other schools, and that they began the mischief; that they had told him grammar was a book, algebra was a book, geometry another book, geography, chemistry, physics, still others; they never told him, never permitted him to guess for himself how these things were actually intense symbols, complex ratios, representing man's relation to nature and his fellow-man; they never told him that his mathematics, &c., came into being in response to a desire in the human breast to come nearer to nature; that the full moon looked round to the human eye ages before the circle was dreamed of.

Our student knows to be sure, as a result of his teaching that the Greeks built certain shaped buildings, that the Goths built certain shaped buildings and that other peoples built other buildings of still other shapes. He knows, moreover, if he has been a conscientious hewer of wood and drawer of water, a thousand and one specific facts concerning the shapes and measurements and ratios of the whole and the parts of said buildings, and can neatly and deftly draw and colour them to scale. He, moreover, has read in the philosophies or heard at lectures that the architecture of a given time gives one an excellent idea of the civilisation of that time.

This, roughly speaking, is the sum total of his education, and he takes his architectural instruction literally, just as he has taken every other form of instruction literally from the time he was a child—because he has been told to do so; because he has been told that architecture is a fixed, a real, a specific, a definite thing, that it is all done, that it is all known, arranged, tabulated and put away neatly in handy packages called books. He is allowed to believe, though perhaps not distinctly so taught, that, to all intents and purposes, when his turn comes, if he wishes to make some architecture for Americans or for this generation at large, he can dip it out of his books with the same facility that dubs a grocer dipping beans out of a bin. He is taught by the logic of events that architecture in practice easily becomes a commercial article, like a patent medicine, unknown in its mixture and sold to the public exclusively on the brand.

He has seriously been told at the school and has been encouraged in this belief by the endorsement of people of so-called culture, that he can learn all about architecture if he but possess the attributes of scholarship and industry. That architecture is the name of a system of accredited, historical facts as useful, as available and as susceptible to inspection as the books of a mercantile house.

Everything literal, formal and smart in his nature has been encouraged, the early and plastic glow of emotion and sensibility has been ignored.

He has been taught many cold, many dead things, but the one warm living thing that he has not been taught and apparently never will be taught, is the stately and all-comprehending truth that architecture, wherever it has appeared and reached a spontaneous culmination, is not at all what we so rashly call a reality, but, on the contrary, it is a most complex, a glowing and gloriously wrought metaphor, embodying as no other form of language under the sun can do the pure, clean and deep inspiration of the race flowing as a stream of living water from its well-spring to the sea.

He has not been taught that an architect, to be a true exponent of his people, of his time, must possess first, last and always the sympathy, the intuition of a poet; that this is the one real, vital principle that survives through all places and all times.

This seeking for a natural expression of our lives, of our thoughts, our meditations, our feelings, is the architectural art as I understand it, and it is because I so understand it that, ignoring the viciousness of the past, I gladly make an appeal to the good that is in human nature—that goodness of heart and soundness of head, that ready and natural response of the soul in which I have always trusted and shall always trust. It is to this sane and wholesome quality that I plead for the abiding sincerity and nobility of our art. It is to this manliness that I call to come before the judgment-seat and make an answer for us.

I know very well that our country will in due time possess the most interesting, varied, characteristic and beautiful architecture; that the time will begin whenever we take as our point of the departure the few and simple elements of architecture and not its complex forms. That this time will come just so soon as the young are relieved of the depressing weight of a factitious education, the benumbing influence of an instruction that insulates them from the vitalising currents of nature. Just so soon as those having them in charge, coming to the full sense of the fact, realising how truly dangerous a thing is a little knowledge, a partial knowledge, dreading to resume the responsibility for stunted, for imperfectly developed natures, feeling how deeply necessary it is that a technical or intellectual training be supplemented by a full, a rich, a chaste development of the emotions, shall say to the young that they are free, that from the musty school they may fly to the open air, to the unshined, to the birds, the flowers, and wanton and joyous in their own fancies, face to face with the integrity of nature, they shall substitute for the arbitrary discipline of the school the natural, the easy self-control of a dignified manhood, to the end that not books, but personal feeling, personal character and personal responsibility shall form the true foundation of their art.

It has, alas! for centuries been taught that the intellect and the emotions were two separate and antagonistic things. This teaching has been firmly believed, cruelly lived up to.

How depressing it is to realise that it might have been taught that they are two beautifully congenial and harmonious phases of that single and integral essence that we call the soul, that no nature in which the development of either is wanting can be called a completely rounded nature.

That, therefore, Classical architecture, so-called (meaning the Greek), was one-sided and incomplete because it was almost exclusively intellectual. That the emotional architecture (meaning especially the Gothic) was likewise one-sided and incomplete, however great and beautiful its development of feeling, because of the almost total absence of mentality. That a complete architecture has not yet appeared in the history of the world because men, in this form of art alone, have obstinately sought to express themselves solely in terms either of the head or of the heart.

I hold that architectural art, thus far, has failed to reach its highest development, its fullest capability of imagination, of thought and expression because it has not yet found a way to become truly plastic. It does not yet respond to the poet's touch. That it is to-day the only art for which the multitudinous rhythms of outward nature, the manifold fluctuations of man's inner being, have no significance, no place.

That the Greek architecture, unerring as far as it went—and it went very far indeed in one direction—was but one radius within the field of a possible circle of expression. That, though perfect in its eyesight, definite in its desires, clear in its purpose, it was not resourceful in forms; that it lacked the flexibility and the humanity to respond to the varied and constantly-shifting desires of the heart.

It was a pure, it was a noble art, wherefore we call it classic, but after all it was an apologetic art, for while possessing serenity it lacked the divinely human element of mobility; the Greek never caught the secret of the changing of the seasons, the orderly and complete sequence of their rhythms within the calmly moving year. Nor did this self-same Greek know what we now know of nature's bounty, for music in those

days had not been born; this lovely friend approaching man to man had not yet begun to bloom as a rose, to exhale its wondrous perfume.

That the Gothic architecture with sombre, ecstatic eye, with its thought far above with Christ in the heavens, seeing but little here below, feverish and overwrought, taking comfort in gardening and plant life, sympathising deeply with nature's visible forms, evolved a copious and rich variety of incidental expressions but lacked the unitary comprehension, the absolute consciousness and mastery of pure form that can come alone of unclouded and serene contemplation, of perfect repose and peace of mind.

I believe, in other words, that the Greek knew the statics, the Goth the dynamics of the art, but that neither of them suspected the mobile equilibrium of it—neither of them divined the movement and the stability of nature. Failing in this, both have for ever fallen short and must pass away when the true, the poetic architecture shall arise—that architecture which shall speak with clearness, with eloquence and with warmth of the fulness, the completeness of man's intercourse with nature and with his fellow men.

Moreover, we know, or should by this time know, that human nature has now become too rich in possessions, too well equipped, too magnificently endowed that any hitherto architecture can be said to have hinted at its resources, much less to have exhausted them by anticipation.

It is this consciousness, this pride that shall be our motive, our friend, philosopher and guide in the beautiful country that stretches so invitingly before us.

In that land, the schools, having found the object of their long, blind searching, shall teach directness, simplicity, naturalness; they shall protect the young against palpable illusion. They shall teach that, while man once invented a process called composition, nature has for ever brought forth organisms. They shall encourage the love of nature that wells up in every childish heart and shall not suppress, shall not stifle the teeming imagination of the young.

They shall teach, as the result of their own bitter experience, that conscious mental effort, that conscious emotionality are poor mates to breed from, and that true parturition comes of a deep instinctive subconscious desire. That true art, springing fresh from nature, must have in it, to live, much of the glance of an eye, much of the sound of a voice, much of the life of a life. That nature is strong, generous, comprehensive, fecund, subtle; that in growth and decadence she continually sets forth the drama of man's life. That through the rotating seasons, through the procession of the years, through the march of the centuries, permeating all, sustaining all, there murmurs the still, small voice of a Power that holds us in the hollow of its hand.

TESSERÆ.

Microscopic Examination of Stone.

THE practical value of microscopical examinations of stone is much greater than that of ordinary metallurgical productions. In the one case we have a natural production about which we can do nothing without an investigation. In the other case we have an artificial material made for a distinct and definite purpose, to effect which we must needs know more or less of the characteristics and relative reactions of the individual elements constituting the desired compound. The tests ordinarily applied to building stone to determine its physical proportions, although few in number, are in some instances rather complicated and often unreliable. The first and most essential is to determine the structure and character of a stone, to know whether it be granite, sandstone, quartzite, or something else. Although an expert can usually determine at a glance to which, if any, of these groups a particular stone belongs, it is frequently possible to determine the precise lithological character only by a microscopical examination. Thus, for instance, there is a class of Cambrian rocks commonly called sandstones (Potsdam?) that are not sandstones at all, but are hard, compact rocks known as quartzites, which have been derived from sandstones by metamorphic action. The essential difference between a sandstone and a quartzite lies in the presence of secondary silica between the quartz granules comprising the latter; the presence of this secondary silica or quartz can be determined for a certainty only by microscopical means. The microscope is not only useful in determining the structure of a stone, but it has an even greater practical value in making it possible to detect the presence of deleterious substances such as pyrite and marcasite (iron sulphides) or other minerals whose chemical composition is affected by atmospheric agencies and thus exert a deleterious effect upon the stone. The application of the microscope to this, as to every purpose, requires some skill and training, which may, however, be readily acquired by any one to whom the subject is of sufficient interest, microlithology being thoroughly treated in standard works available to all.

Hangings in English Houses.

We are told that the Saxons had their rough and unsightly walls hidden by wall cloths, and that in a Saxon monarch's palace they were purple dyed; but tapestry or hallings, as such luxurious hangings were called, were only partially used in the kingdom until the thirteenth century, but in the succeeding centuries they were universal in the halls of the wealthy, and the richly-worked stuffs of Arras and Brabant were greatly in demand, and large sums were paid for them. They were worked in gold and colour, and enriched with incidents from sacred history or scenes from ancient romance exhibiting chivalric exploits; these were frequently rendered explicit by sayings and mottoes, streaming on scrolls from the mouths of the principal personages, such explanations becoming household words, and hence originating much proverbial wisdom. Simpler and less costly hangings were patterned over with fleur-de-lis, roses and heraldic insignia; and in the fourteenth century, if not earlier, the village of Worsted, in Norfolk, produced a fabric that yielded comfort to the living chamber of the middle classes—the manufacture taking the name of the place from whence it originated. Though the tapestry was often surpassingly rich, yet the choicest piece was displayed behind the seat of the owner of the hall—it was called the dorsel or dorser. The embellishments figured upon it were either arms, monograms or damask patterns, as may be seen in illuminated MSS.

Sketching from Nature.

Drawing has a great charm for hundreds who never desire to exhibit their pictures in public, and who do not even care for fame of a humbler sort amongst their friends and acquaintances. Quiet, self-withdrawn, observant seekers of the beautiful and the good, it is enough for them that the dew glistens on the grass, that the sun shines, that the sky is blue. Their pleasures are simple and therefore their pleasures are continuous. A weed gives them enough matter for meditation. Nature is one vast harmony and their ears are never closed; a gallery full of the most brilliant tints, and they go in and out as they list and see with keener eyes than their fellows. The simplest curves of a leaf or the bloom of a petal gives them as much pleasure as most men would experience in the Trosachs or amongst the Devonshire valleys. The purple of the horizon in the flattest country, the dash of shadow upon the meadow, or glow of sunshine upon distant hills—these, amongst the commonest sights of the commonest landscape, fill them with joy. And withal, the current of their lives runs so calmly, so peacefully, one might almost be tempted to apply to them the Psalmist's words, "They come not into misfortune like other folk, neither are they plagued like other men." The keenest thrusts of trouble never seem to strike them down. The arrows of envy or malice glance off from them, harmless. The little annoyances of daily life do not annoy them. And in great trials, too, they show bravely. Their grief is less petulant than the grief of others. Is it that they feel less deeply? No, it is because (strange as the paradox may seem) they feel more deeply that they sorrow less. Living much amongst realities, they are less amazed when they stand face to face with real trouble and affliction, with the last great reality—death—than those who live with the phantoms of the world and are ever chasing phantoms of fashion and wealth and pleasure. In their solitary communings with nature they have learnt deeper lessons than those merely of the palette and the brush; they have seen fairer visions than of green leaf or purple tree-trunk; have heard finer harmonies than the rising wind makes, or the restless surge, or singing bird of sweetest note. There are, it may be, so many kinds of voices in the world and none of them without signification to the attentive ear. And in these men the imagination is generally healthy and strong. Their eye stops not at the outer husk and sensuous appearance, but pierces through and through, observing all, taking note of all. And while fancy's idle dart glances off from the hard armour of seeming in which all things are wrapt, for disguise or for security, the weapon of imagination is of the finest temper and can penetrate to their heart, to the root and origin of their being. At any rate, the true lover of nature, the naturalist, the sketcher, finds somewhere a charm, cradled in the heart of creation, which is of mighty force to assuage vain regrets for the past, to drive away the small troubles of daily life, and to throw a brilliant lustre upon the hopes and the aspirations of the future.

Architecture and Nature.

Not nature but industry taught man to model the uncouth and misshapen stump which in primitive times supported the roof of his habitation, and industry at length gave birth to that art which introduced magnificence of design, uniformity of structure and elegance of execution, and prescribed the form of those different orders of architecture upon which the eye of taste loves to dwell with so much pleasure and delight. In order, however, to decide whether architecture be not rather an invention of art than an imitation of nature, we need only glance at a few of those leading acquisitions upon which depend

the skill of the architect. He must, in the first place, be versed principally in mathematical knowledge; secondly, physics, or rather that part of it which regards the action of bodies operating relatively by their mutual weight and pressure, must also form no contemptible branch of his attainment; and from the combination of these two sciences there must result a third, technically termed "construction," which constitutes the principal part of the builder's skill, and consists in executing with exactness and solidity whatever projection may be delineated upon paper. Guided by the rules which result from this threefold knowledge have such stupendous fabrics been erected as have for past ages been co-existent nearly with the world itself. Nature furnished us with the quarry, but industry extracted from it the materials with which art constructed the immense pyramids of Egypt. We must not here omit to notice how much we are indebted to art for the invention of the numerous mechanical powers which enable the workman to elevate huge masses of stone to a considerable height. Having noticed these and acknowledging them to be the result of human art and ingenuity, how can we consider architecture to be an imitative art? Whether any mischiefs have arisen by a deviation from pristine nature need not now be inquired into; the uninformed and savage man might still, it is true, have continued to erect his humble habitations of repose, and have been indebted to no projections of art for ease and comfort. Nature would have sufficed for that. But it is conclusive that without the assistance of the arts and the sciences the chieftains of ancient Rome would have wanted triumphal arches to record their victories, her citizens would have had no amphitheatres, her emperors no palaces, her gods no temples. Indeed, the more we examine in how very few particulars we are indebted to nature for models of imitation, and what a considerable accession of strength, beauty and elegance has been derived from art, the less we shall hesitate in determining that architecture is not (like the art of drawing, for instance) an imitative art, but rather an original discovery of human ingenuity, or at any rate that its imitations of nature (if any) are so very faint and far removed from the original that it may safely be pronounced to have been an art invented.

Wayside Chapels.

Wayside chapels are much more frequent in continental countries than in our own. Indeed, in travelling abroad, the pretty wayside chapels and crosses, with peasants kneeling serve more than most other things to remind us that we are away from home. In Switzerland the shingled spires of roadside chapels built on the central piers of bridges cast their shadows into many a snow stream. In France and Italy they are equally numerous. They are of much diversity of form, some being square or oblong, whilst others are built upon triangular, hexagonal and circular plans. There are numerous examples of chapels built of two storeys in height, as at the gorgeous Sainte-Chapelle at Paris. In these instances the upper chapel, which was on a level with the principal floor of the palaces, contained the precious relics and a gallery for the royal family to pay their devotions in; the lower was appropriated to public worship. When a chapel was built over a crypt this disposition was reversed; the crypt contained the relics, and the chapel was devoted to worship. A singular example exists, about six kilometres from Mont Louis, called La Chapelle de Planès, composed of a cupola carried upon a triangular base, having a large semicircular niche thrown out from each plane. This eccentric plan is assumed by M. Viollet le-Duc to be emblematical of its dedication to the Trinity. Another curious example of an isolated chapel exists in a cemetery within the precincts of the abbey of Mont Major, near Arles. This is built upon a quatrefoil-formed plan, having a porch thrown out from one of the semicircles to form an entrance; it is surmounted by a bell turret. The most recent of French wayside chapels is that built upon the spot on which the Duke of Orleans, eldest son of Louis Philippe, met with the accident that occasioned his death. The most remarkable of the ancient continental wayside chapels, however, is that dedicated to Santa Maria de l'Epina, built upon the approach to Ponte Nuovo over the Arno, at Pisa. It is built of the rich materials of the locality, and is elaborately ornamented with niches containing statues. Those who have seen it radiant with sunshine will need no reminder of its many graces. It was erected circa A.D. 1230. Alterations and renovations, rendered necessary by its decay or destruction, have been made in successive centuries. A single thorn, said to be from the Holy Crown of Thorns, was enshrined in it, and the wayside chapel of St. Mary of the Thorn became the object of prayer and pilgrimage.

Figure Painting.

Painting conveys ideas by form, colour and light and shadow, but colour and light and shadow without form can do little; an exact knowledge of the forms of things is therefore necessary to express ideas clearly, and the power of representing things exactly as they are, or ought to be on canvas,

constitutes the painter. We all know how many fancies and visions, how many beautiful arrangements and refined expressions pass into oblivion in our youth from the want of this power; it is this power we lag for, not ideas; the sooner it is acquired the happier and greater is the artist; yet it cannot be acquired but by never suffering an atom to remain uninvestigated and unresearched, till at last all nature is laid open, all animated being is at his disposal and under his control. The moderns equal the ancients in facility, but do not so steep it in science that it is thrown away. Facility will come from mere mechanical repetition; the great principle is so to educate your mind that when execution rushes on your hand from habitual exercise your mind may know exactly where to direct the fury of your hand. This is the great principle of art, these are the moments of rapture every man of genius sees at the end of his labours; till this delightful, stupendous power is acquired, what miseries, what checks, what struggles must he not undergo, but if he have but the resolution to proceed firmly through them, then indeed will his reward be great; then indeed will his mind, impregnated with science, and his hand, fearless by practice, be enabled as fast as visions float on his fancy to shower them on his canvas with inspired profusion. Let the rising students on whom the reputation of this country for greatness of art depends recollect that this power cannot be acquired but by acting on the same principle, from the first dawning of a wish to be an artist to the last moment of life. In the first years of study let them consider every figure they draw, as if their existence depended on its excellence, let them look and compare, scrutinise and alter; what they cannot see distinctly in shadow let them carefully examine and ascertain; let them draw exactly what they see and nothing more or less; let them get a perfect knowledge of things as they are before they presume to alter the model before them, if but the thousandth part of a hair's point.

Roman Collectors.

That so little of the wonderful accumulation of precious objects with which Rome overflowed has come down to our time—that the gold and silver, and even the bronze, should have been melted and transformed into other shapes—is not surprising, but how few examples remain of the vessels of agate, onyx, crystal and the precious murrhine which so abounded in the Roman palaces. Mithridates is said to have possessed 2,000 vases of precious materials. According to tradition, the "coupe des Ptolémées" in the Bibliothèque Nationale formed a part of this collection, but where are the 999? The consular personage of whom, without naming him, Pliny tells the odd story that he showed his affection for a murrhine bowl which had cost him a sum equal to about 5,000*l.* by gnawing its rim, possessed such a quantity of vessels made of that precious material that they filled the private theatre which Nero had constructed in his gardens beyond the Tiber. Yet not one solitary vessel has come down to our times which has a fair claim to be deemed an example of "murrhine," as corresponding with the minute description of that substance by Pliny. The great naturalist and others tell us that murrhine was imitated in glass, and fragments of glass vessels are found near Rome which correspond very fairly with Pliny's description. Mr. Story-Maskelyne has shown very conclusively that murrhine was in all probability agate brought from India, the colour of which had been reddened by the application of heat, as is now actually done in that country. Among the Roman collectors, the line between those who collected rarities of nature, and those to whom art was everything, was much less sharply drawn than is usually the case at the present day. This seems to characterise a primitive era of collecting. We find the same thing in the collections of the sixteenth and seventeenth centuries; and still more among the Chinese, of many of whose most valued works of art it may not unfairly be said, "Materies superabat opus." The Romans vinced this propensity to value an object more for the rarity of its material than for the art which it evinced, by the extravagant prices which they gave for objects of precious material when they were of more than common size or beauty. Petronius is said to have given a sum of more than 60,000*l.* for a single cup of murrhine, which he broke to pieces at his death in order to disappoint Nero of its possession. From 10,000*l.* to 10,000*l.* was no uncommon price for a table of thuya of large size and perfect in its markings, or as our upholsterers now say, pattern. These sums would seem incredible, but the statements are so frequently made, and by so many authors, that it seems impossible to doubt their substantial truth. It must, however, be owned that many among them paid most handsomely for works in which, on the contrary, "materiem superabat opus;" for although Roman silver plate was much more solid and heavy in proportion to size than that of our day, 100 sesterces (say 50*l.*) was about the price of a pound of melted silver; and Pytheas sold his work at the apparently fabulous price of 50*l.* per ounce. Doubtless none of the finest samples of silver work have reached us, but those which do

survive enable us to judge how admirable Roman plate often was, both in design and execution.

The Collection of Charles I.

After the death of Charles I. foreign princes were eager to enrich their cabinets with the works which his superior taste had selected. The pictures which formed that part of the royal gallery called the Mantua collection alone cost the King 80,000*l.* The Lord Abbot Montagu, almoner to Queen Henrietta, and many other noblemen and gentlemen, had presented the King with paintings. One of the first acts of Oliver Cromwell and his adherents after the death of the King was the disposal of the pictures, statues, tapestry hangings and other splendid ornaments of the royal palaces. Among the distinguished purchasers of this valuable plunder was the Cardinal Mazarin. The ambassador from Spain, Don Alonzo de Cardenas, purchased a number of the finest pictures in the royal collection, and sent them to Madrid, where they now remain within the walls of the Escorial. Christina, Queen of Sweden, purchased several pictures of great price, and many of the choicest medals and jewels. The Archduke Leopold expended large sums for many of the best pictures, which were sent into Germany. Some splendid and rich tapestry, wrought for Charles when Prince of Wales, was also purchased by Leopold, which found its way again into England, being repurchased at Brussels for the sum of 3,000*l.* by Frederick Prince of Wales. The greater part of the royal collection was appraised and sold by order of the Parliament, several paintings belonging to which produced higher sums than those at which they were valued. The pictures at Wimbledon and Greenwich, amounting to 143 in number, were appraised at 1,709*l.* 19*s.* Pictures at the Bear Gallery and some in the privy lodgings at Whitehall, in number sixty-one, appraised at 2,291*l.* 10*s.*; among these were the Cartoons by Raphael, which sold for only 300*l.*, when a picture of the "Nativity" by Giulio Romano, fetched 500*l.* Pictures at Oatlands, in number eighty-one, appraised at 733*l.* 18*s.* Pictures at Nonsuch House, in number thirty-three, appraised at 282*l.* Pictures in Somerset House, with those which came from Whitehall and St. James's, in number 447, appraised at 10,052*l.* 11*s.* Among these a "Sleeping Venus" by Titian sold for 1,000*l.* and a "Madonna" by Raphael sold for 2,000*l.* "Venus de Pardo" by Titian sold for 600*l.*; it was appraised at 500*l.* This and a great number of the finest pictures sold in the same proportion. Pictures at Hampton Court, in number 332, appraised at 4,675*l.* 10*s.* In the committee-rooms at the Parliament House were pictures valued at 119*l.* Pictures at St. James's, in number 290, appraised at 12,049*l.* 4*s.* Among these two pictures of the same subject, "Playing a Satyr," sold for 1,000*l.* each. "Hercules and Cacus" by Guido Bolognese sold for 400*l.* The statues at Somerset House belonging to King Charles were appraised and sold by the council of state. In the gallery 120 pieces of sculpture, 2,387*l.* 3*s.* In the garden of Somerset House twenty sculptures, 1,165*l.* 14*s.* At Greenwich 230 statues, 13,780*l.* 13*s.* 6*d.* In the armoury of St. James's twenty-nine pieces of sculpture, 656*l.*

The Gothic Revival.

Mediæval art owes its revival to the labours of three individuals, viz. Rickman, Blore, and above all, Augustus Welby Pugin. The first did the great service of distinguishing the various styles and publishing books to guide researches. The second, who was one of the most minute and beautiful architectural draughtsmen the world has ever beheld, throughout a long and active practice erected numerous buildings with correct detail. But it was reserved to A. W. Pugin to wake up people by his enunciation of true principles; and although his sharp satire doubtless hurt the feelings of many, it did immeasurable good to everybody in the profession. But Pugin was only one man, and the most gifted can only do a certain amount of work. It was, therefore, lucky that the subject was taken up by the much-abused Cambridge Camden Society, and right well they did their work: by means of patient investigations of parish churches and by means of most unsparing sarcasm, they at last drilled architects into building churches by recipe. No one at the present day does build a bad church, such a church as was too often seen at the time, and therefore let all honour be given to the Camden Society. Rickman and Blore went in for Perpendicular. The majority of the Peel churches were built in Early English, because as Beresford Hope observed that style was supposed to survive more starvation than any other. Pugin practised in many styles, but his forte was in French Flamboyant. The Ecclesiological Society enjoined Decorated. Now all this was mere architecture, or rather the bones of the building without the flesh. Mr. Ruskin arrived to supply the deficiency and to point out the intimate connection between good sculpture and good architecture; he also directed people's attention to the beauties of Early French Gothic and afterwards to that of Italy, although his lessons in the latter have hardly been understood as they should have been.

NOTES AND COMMENTS.

THE valuation and assessment of house property in England cannot be considered as satisfactory, and a more equitable distribution of taxation would follow if the Irish precedent were imitated and a Government Valuation Department set up. An attempt is to be made in the next session to remedy some of the abuses which prevail in the Metropolis. A Bill has been lodged by the London County Council which proposes to repeal the London Assessment Acts of 1862, 1864, 1869 and 1884, and to re-enact some of the provisions of these Acts in an amended and codified form. The 126 clauses which are contained in the Bill comprise within them the whole of the clauses of the Valuation (Metropolis) Bill, which was introduced into Parliament last session as a Public Bill. It is proposed to establish a "London County Valuation Court," to consist of three members, one of whom shall be a barrister or solicitor of not less than ten years' standing, one a member of the Surveyors' Institution of not less than ten years' standing, and one shall be a person, not being a barrister, solicitor, or surveyor, who shall have some experience in the assessment of property. The members of the Court are to receive such a salary as the Local Government Board may decide, and are to be entitled to a Civil Service superannuation allowance. The duties of the Court will be to decide all questions of valuation, whether in the nature of appeals by the Council against the valuation list of any assessment committee, or appeals by ratepayers against their assessments.

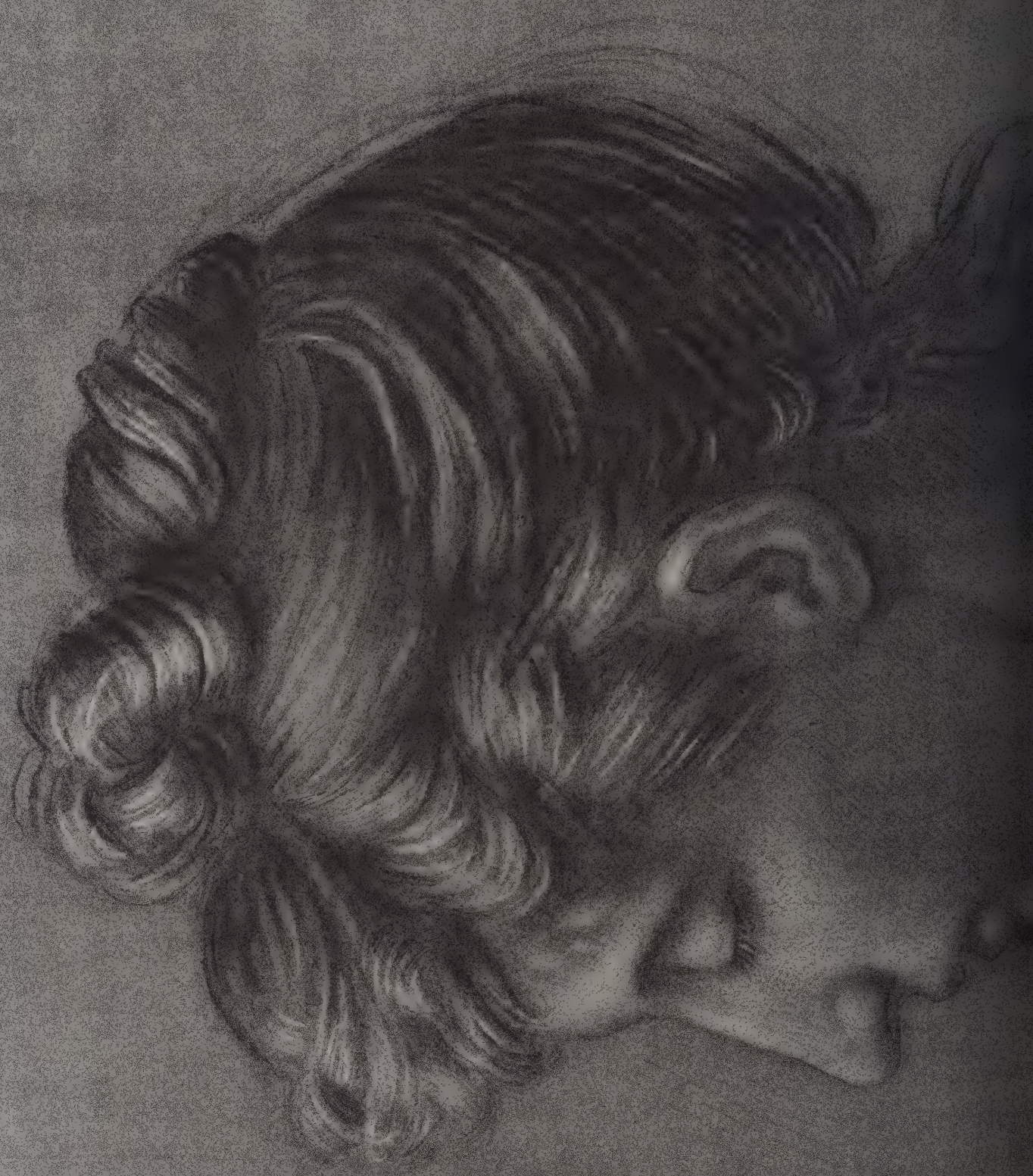
THE Local Government Board have ordered an inquiry into the conditions of the water-supply of Downpatrick, which deserves the attention of other people besides sanitarians. Recently a very large sum of money was expended on the works. A large reservoir was constructed. When the water was supplied to the town it was not fit for drinking. People who made the experiment became very ill. Sir CHARLES CAMERON was asked to analyse the water and declared it to be dangerous. The medical officer of the district arrived at a similar conclusion. The evil was caused by a layer of peat at the bottom of the reservoir, which was not covered with cement, or rendered innocuous. It is remarkable that the engineering surveys, the public investigations by Government officers, and all the tests which are gone through before money is advanced for sanitary works, did not discover the existence of a square foot of peat. We must, therefore, suppose either that the investigations were conducted with culpable negligence, or that in the course of a year or two a stratum of peat 6 or 7 feet in depth and extending over the area of a large reservoir could be formed. According to geologists the change from wood into peat as into lignite and coal needs a long period of time. There are certainly no precedents to explain the expedition of the peat-forming process in the North of Ireland, but then the physical and moral laws which rule other countries have no power in the western isle. Some will say the affair is only another example of the want of foresight on the part of Irish engineers and contractors, through which so many millions of English money have been wasted in efforts to improve that country. The most remarkable fact connected with the case is that the Government inspector who reported in favour of the scheme has been deputed to investigate its break-down. When will a Chief Secretary be found with courage to overhaul the engineering arrangements which prevail in the Irish departments?

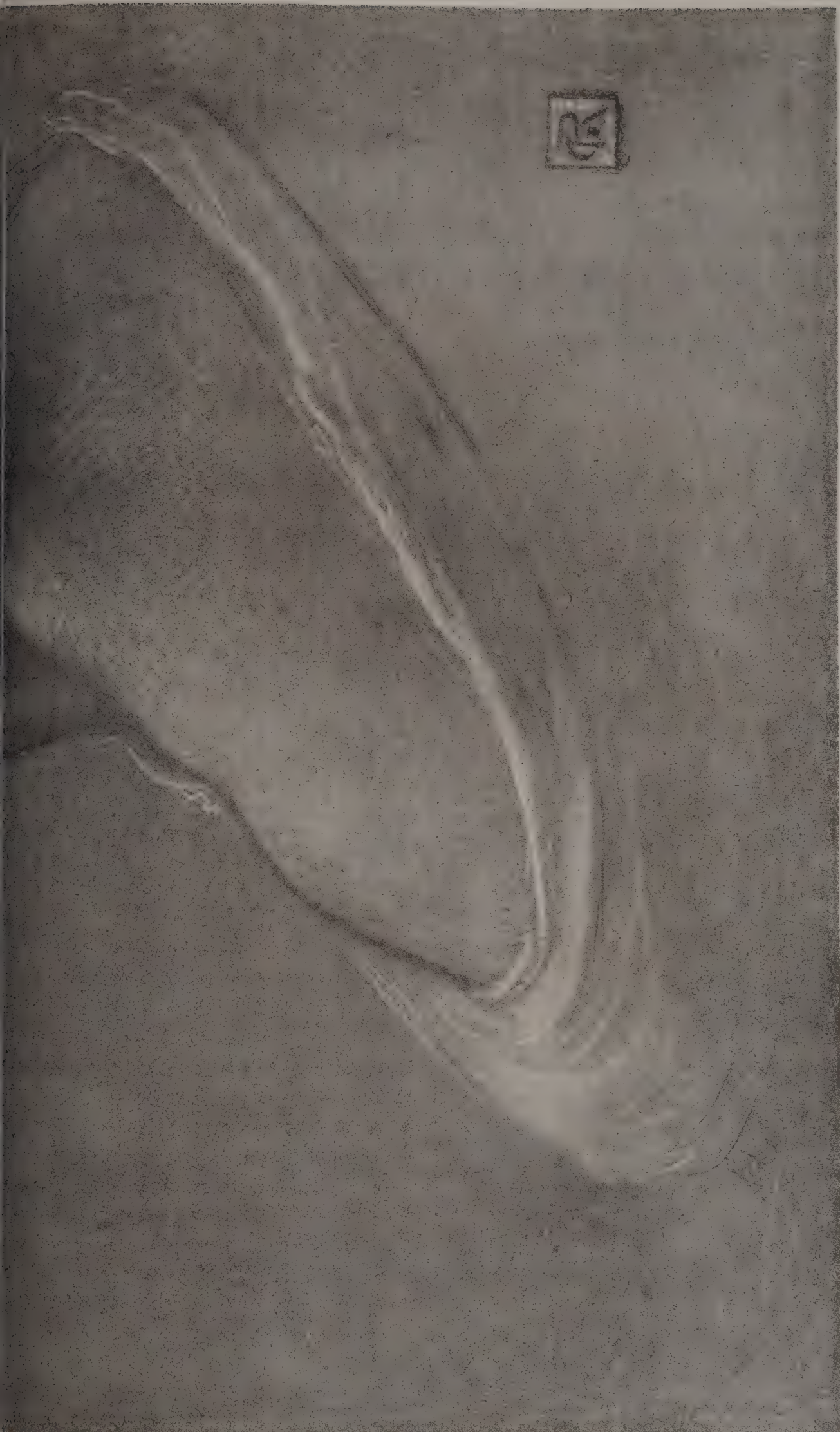
WE lately noticed the catalogue of the books on architecture in the public library of Liverpool. That collection, excellent as it is in quantity and quality, will not bear comparison with what is to be found in the public library of Boston, U.S., which requires a catalogue of three hundred closely-printed columns. The books are classed in twelve divisions, viz bibliography, biography, dictionaries, history and theory, periodicals, periods and styles, architecture of countries, illustrations of architecture, architectural details, technical details, building laws, contracts, &c. There are of course subdivisions; the eighth division, for example, relates to amphitheatres, asylums, baths, castles and palaces,

churches and cathedrals, commemorative monuments, commercial and public buildings, conservatories, domestic architecture, fountains, libraries, parks and gardens, prisons, railroad stations and buildings, schools, colleges, &c., stables and barns, theatres. The whereabouts of every book in the library is marked in the catalogue, and it is not necessary, as in so many English libraries, to waste time before an application for a book is handed in. There is also an index to authors and another to places and subjects. Suppose a student seeks examples of knockers. He can see at once that GRAVENBROCH'S "Raccolta di Battitori a Venezia" is in the library; or if he should be anxious to ascertain whether the qualities of sandstone were grappled with in days when chemists and geologists were unknown, he can at once lay his hand on OPDERBECKE'S "Die Bauformen des Mittelalters in Sandstein." Anyone who is thinking of a voyage to Europe or the East has only to look for the names of the towns he is likely to visit and he will find a list of books referring to them. Thus for Canterbury there are STANLEY'S, WILLIS'S, OWEN'S, besides DART'S and DRAKE'S and GOSTLING'S which were published in the last century. Not one of them, we believe, is to be found in the public library of Canterbury. In preparing the catalogue it is evident the principle that "Time is money" was observed. It would be a great advantage if our English librarians would condescend to take a hint from their brethren in Boston. Although so comprehensive a collection of English, French, German and Italian books is in this country only to be seen in the British Museum, yet with similar catalogues the books in English libraries could become more useful.

A NEW pulpit for the parish church of Framfield, Sussex, has been dedicated. It is designed in the style of the fifteenth century. On plan it is five sides of an octagon, and the upper portion is of wainscot oak, while each side has a moulded arched panel, the ornamented cusping springing from moulded capitals having circular shafts. Over each arch is a crocketed hood-mould with carved finial, the same moulding being carried round at the springing line as a connecting string to the composition. The hollow mouldings are enriched with pearl-like ornaments, and on either side of each panel is a small V-planned pinnacle having a floriated termination. At the five angles are detached pentagonal hollow-sided shafts with carved finials. The top of the pulpit is finished with a moulded cornice, enriched with a species of embattlement and by carved pateræ, the spandrels between the cornice and the arched panels having trefoil cusped perforations. The panels are filled with sculptured figures in high relief, i.e. OUR LORD in the act of teaching in the centre, flanked by the four Evangelists with their respective symbols, each standing on a moulded pedestal. The lower part of the oak portion of the pulpit is finished with a moulded plinth, carried round the detached shafts at the angles. The pedestal is of polished mottled alabaster, with a boldly moulded capital and base. The steps are of Portland stone. The whole of the oak is left clean from the tool. The pulpit is a gift of Mr. BARCLAY WATSON. The work has been executed by Mr. FORSYTH, from the designs of Mr. B. EDMUND FERREY, F.S.A., who carried out the recent extensive works to the church.

ALTHOUGH Mr. SEARLE'S new work on "Quantities" is not complete, yet the four parts which have appeared are enough to indicate its character. We may safely assume that it will surpass all the preceding works on the subject. The author has extraordinary analytical power, which he utilises in his exposition, and any ordinary student can follow the instruction without difficulty. As the pages are quarto in size they enable grouping to be effected, which permits a student, as it were, to perceive some of the most important relations of the subject at a glance. The varieties of type employed also facilitate the acquirement of knowledge and make reference much easier. If the treatise is completed in the style of the parts in print there is no doubt that Mr. SEARLE'S work will become the standard authority on the subject.



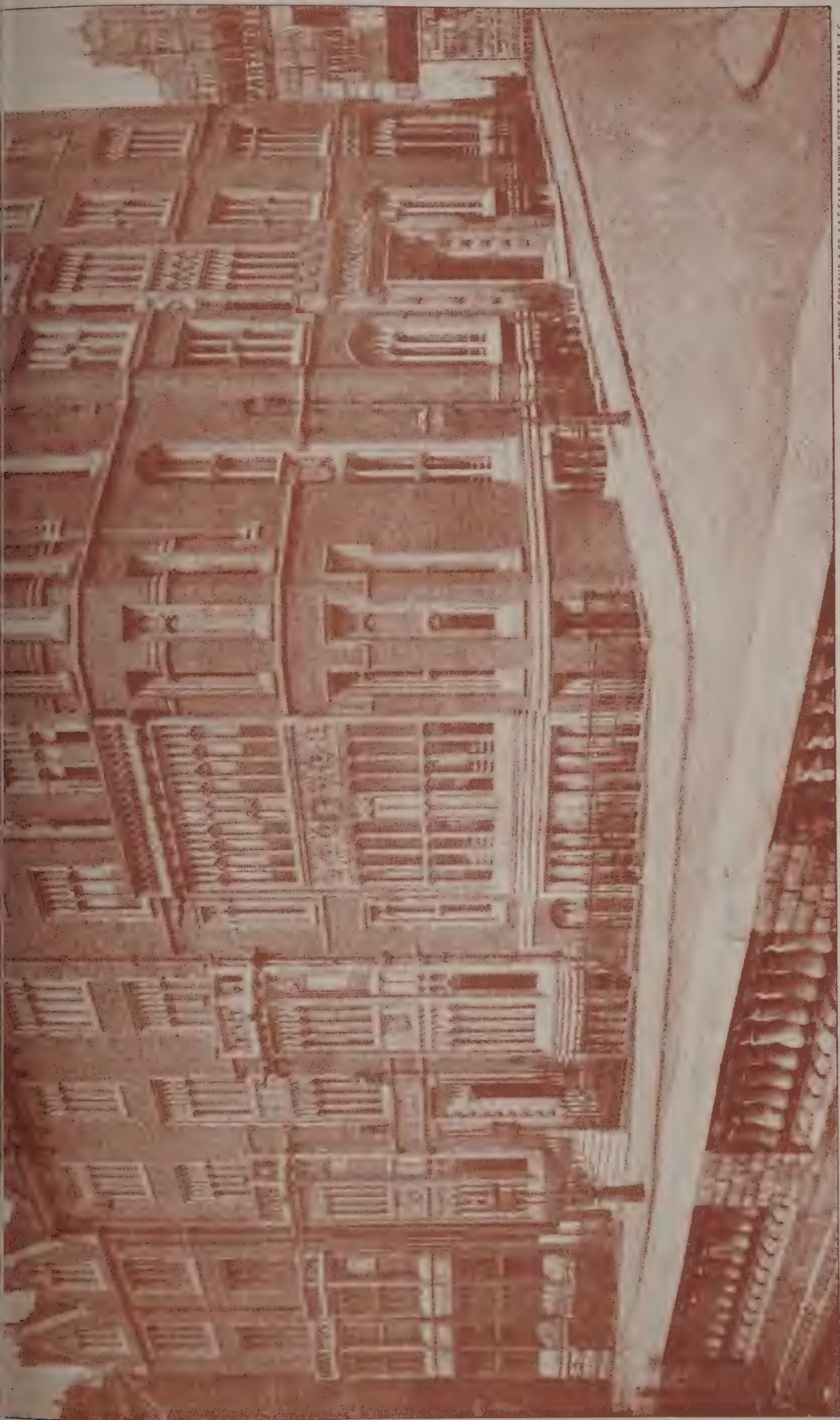


STUDY OF A HEAD.
By G. WOOLLISCROFT RHEAD.

INK PHOTO. SPRAGUE & CO 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

Die Architektur, Dec. 28th 1894.



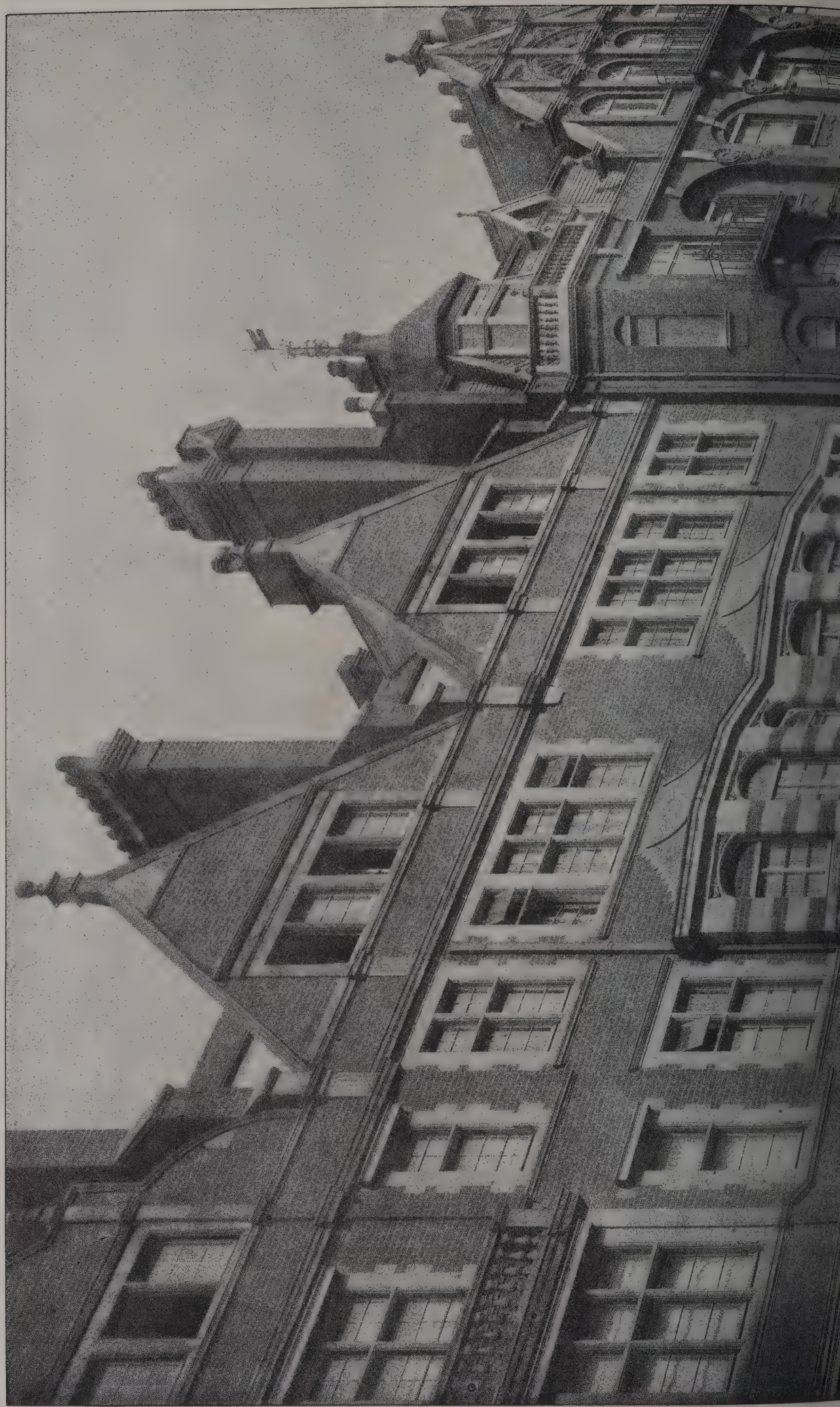


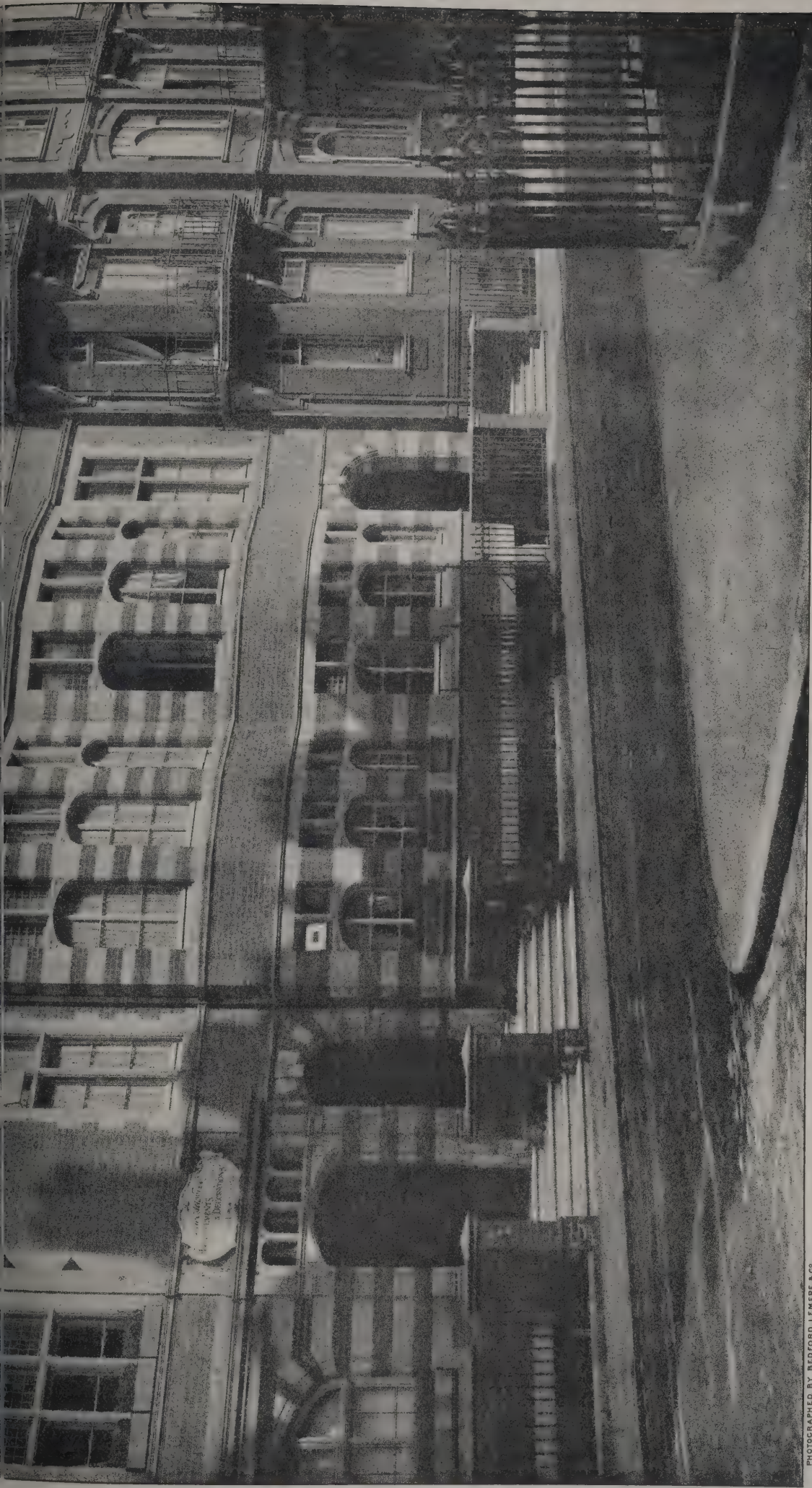
INN- PHOTO. SPRAGUE & CO. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PHOTOGRAPHED BY BEDFORD LEWIS & CO.

"SURREY" AND "MOWBRAY" HOUSES, VICTORIA EMBANKMENT, W.C.
JOHN DUNN, Architect.

Die Architect, Dec. 28th 1894.





PHOTOGRAPHED BY BEDFORD LEMERE & CO

INK- PHOTO, SPRAGUE & CO 4 & 5, EAST HARDING STREET, PETTER LANE, E.C.

45 AND 46 MOUNT STREET, GROSVENOR SQUARE, W.
W. D. CARÖE, Architect.

ILLUSTRATIONS.

STUDY OF A HEAD.

THE original drawing, by Mr. G. W. RHEAD, from which the illustration is reproduced, was exhibited this year in the Royal Academy.

SURREY AND MOWBRAY HOUSES, VICTORIA EMBANKMENT, W.C.

45 & 48 MOUNT STREET, GROSVENOR SQUARE, W.

THE MODERN THEATRE OF THE CONTINENT.

By EDWIN O. SACHS.

(Concluded from page 401.)

Orchestra.

AS to the orchestra, of course the dimensions and position varies greatly according to circumstances. A small dramatic house I once noticed had a string orchestra stowed away behind a grille in one of the upper boxes at the side of the proscenium. These upper boxes are generally almost valueless to the manager, and hidden music is certainly always very fascinating. The grille should be of bamboo. Iron gratings would change the sound of the music. Speaking of grilles and gratings, gentlemen, I would just mention that theatres in Mohammedan countries require grilles to a certain number of the private boxes reserved for the native ladies. In the Khedive's Opera House at Cairo I noticed the architect had apparently forgotten these essentials, and some ugly makeshifts in the form of semi-transparent curtains were used. One could see the ladies quite well. We generally find it in its usual place abroad, just in front of the stage, though generally sunk deeper into the floor than in England. Wagner always made a point of having a sunk orchestra for his operas, and he built one on these lines in his Bayreuth Theatre. What is good for Wagner's music does not, however, hold good for a light opera by Strauss or Sullivan, and hence the new invention abroad of a movable orchestral floor regulated by hydraulics. The first movable floor was completed last month at the new Wiesbaden Theatre. Of course there was much witticism as to the new arrangement, and during a rehearsal a wag even pulled one of the levers so that the whole orchestra bodily rose while attempting to play a passage with a gradual crescendo. A spectator tells me the situation was rather comic. The idea of the movable orchestra is, however, very good, and there is little doubt that it will soon be introduced in all theatres which have the great variety of programme I explained. Most orchestra wells abroad can of course be made larger or smaller, to suit special requirements. An extra row of stalls is either put in or left out. Great care is taken to provide good exits for the orchestra, and no connection between the stage mezzanine and the orchestra well is allowed. It is necessary that the orchestra should be quite at ease as to its position, for by continuing to play, whatever may be happening on the stage, panics can be prevented.

Now, gentlemen, this finishes the "Front of the House" as far as I can refer to it to-night. The field is an enormous one, and I can only touch on its outskirts. There are numberless interesting details that I should like to speak about, but, as I said when I started, I must limit myself to the chief features. Before entering stageland I will just say a few words as to the safety of life in theatres.

Safety.

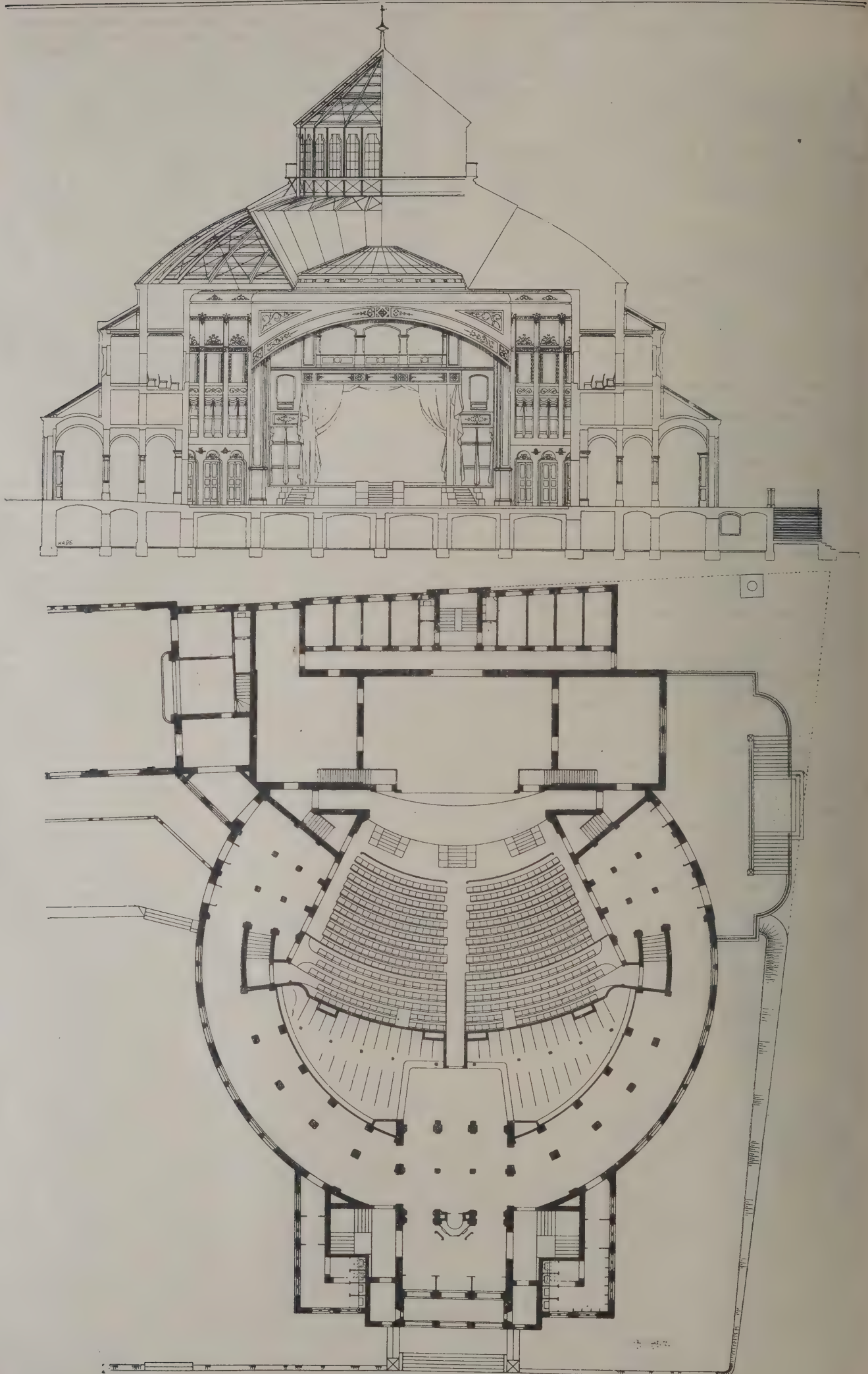
To my mind, as I said before, life is of major importance, and the building of minor consideration, and this especially holds good in this country, where losses by fire count for nothing, and fires are even considered to be good for trade. Where life is the only consideration, perfect means of exit in case of panic comes first, and then the reduction of the risk of panic caused by fire, by good lighting and warming appliances, cleanliness, careful stage management, slow combustion, stage plant, and perhaps the isolation of the building. As long as the staircases are well planned they can be of wood. Fire-extinguishing apparatus is almost superfluous. If the property is to be saved, the building must be divided into a number of "risks," both horizontally and vertically; it should be built of slow-combustion materials, should have its own well-manned, fire-extinguishing appliances, and not be too far from organised outside help. Whatever care be taken to save the audience it will, however, not count for much if they cannot help themselves by keeping their heads, and likewise whatever is done for the building, it is minimal compared to the advantages of the manager and his employes being practical men who are cool in

all emergencies. An authority asked, at a Parliamentary committee of inquiry, to explain London's immunity from theatre catastrophes, simply put it down to "luck." Nothing of the kind. Our immunity from catastrophes is due to the average Londoner's temperament and the clearheadedness of our workmen. The little flare we saw at a notable first night not many weeks ago close to the Strand would have caused a stampede in France or Italy. I remember seeing an audience up and partly off in panic on account of a few sparks off an electric contact in the auditorium. A limelight accident, as we had it at another theatre last winter, would, I regret to say, have made almost any continental stage carpenter leave his post. Our stage carpenter's pluck and smartness, his cap and coat, have saved hundreds of lives that must necessarily have been lost if we had a panic in one of our mouse-traps. Our bright sportsmen and athletes, who are at the most amused if something goes wrong on the stage, and our young ladies, who seem to keep their heads better in real emergencies than the so-called weaker sex of any other country, have almost saved as many. You will, perhaps, ask how I account for Germany's immunity. It is not clearheadedness there, but simply the continual careful plodding fire survey, and the custom of having strong fire watches of the picked men of the city fire brigade on the stage which prevents catastrophes. The German stage carpenter is not a smart man, and the audiences easily take fright.

Stage.

The most remarkable features of the continental stage are its appliances. Stage mechanism is being treated as a science. Capable, scientifically-trained engineers replace the stage carpenter of old. The only wood to be found on or about the modern stage is generally in the stage floor, and here hard oak or teak is used. The reform is a *bona fide* one, not merely an adaptation of the old stage to suit modern requirements. The monstrosity of rows of "flies," and footlights which throw their glare upwards on to the actor's chin instead of downwards on to his forehead, is gradually being done away with. The streak of limelight that used to follow the actor about will soon be forgotten. To illustrate the effects of our present ridiculous lighting arrangements, Professor Herkomer, R.A., has kindly put two interesting sketches at my disposal for the evening. Both vividly show us, if I may call it so, "reverse" lighting. There are two systems of *mis-en-scène*, the one requiring a possible imitation of nature, the other attempting the simplest indication of general surroundings. For the imitation of nature, the so-called "horizon," the careful grouping and the rational method of lighting are as essential as the scene-painter's handiwork. For the indication of surroundings all attempts at perspective should be avoided. A well-painted background and monochrome drapery instead of "flies" will suffice. The skill of the first-class engineer will, of course, only be wanted where the possible imitation of nature is required. With hydraulics at his disposal, he will be able to supply every want of the artist without any cumbersome crowding of the stage with all manner of platforms and supports. It is impossible for me to-night to enter into a description of modern stage appliances. I would only remark that the system of the Vienna "Asphaleia" Company, the first attempt at entire reform, is gradually being improved upon. The great reformers of the modern continental stage are the engineers Messrs. Brandt (Berlin), Christofani (Buda-Pesth), Bretschneider (Vienna), Lautenschlaeger (Munich), Richter (Darmstadt) and Rudolf (Vienna). As far as the risk of panic and fire is concerned, the iron stage does not perhaps have quite as many advantages as are generally ascribed to it. The canvas scenery always remains, and if it commences to burn the heat engendered will soon destroy everything and probably the iron roof first, thus soon causing a general collapse. I show a photograph of a fire at a panorama I saw at Vienna. The one large canvas sheet which caught fire almost immediately destroyed the roof. Canvas burns terribly rapidly and fiercely. Electric lighting is of course a great improvement as far as safety is concerned, but absolute reliance on immunity from fire on account of its introduction would be reckless indeed. Some authorities I know consider an iron stage lighted by electricity practically safe. At Warsaw, for instance, I visited the old opera house, which was being renovated regardless of expense, and found that the architect had purposely not allowed for an iron curtain on account of the electric light and modern stage machinery. Of the disadvantages of iron stages let me mention their effect on the acoustics of the building, the difficulty of giving the stage a comfortable temperature in winter time, and further, the greater risk of accidents to the employees. To improve the acoustics the top of the stage is generally kept full of canvas, and this of course means an extra risk. Sprinklers, for instance, cannot be as effective where the streams of water are constantly blocked by rolls of canvas.

This brings me to the protection of the stage in the case of a fire having broken out. Abroad, reliance is almost entirely placed on the firemen with their buckets of water and hydrants close at hand. Next come the sprinklers. The



THE PEOPLE'S THEATRE, WORMS.
Herr March, Architect.

ventilation flue over the stage and the great divisional iron curtain are to prevent the spread of fire in the direction of the auditorium. Hydrants with good reliable pressure, and hose and branch attached ready to be run out, are always provided in the continental theatre in great number, and I would here remark that the cock can generally be opened with one movement only. Of course the firemen belong to the local brigade and stand under the municipal officers. Sprinklers are very common abroad in the new theatres. I had little faith in them for theatre risks until May last, when I saw them tried at the Buda-Pesth Opera House. The stage was literally flooded; the first deluge was already sufficiently formidable to swamp the largest fire. The rows of sprinklers are generally divided into sections abroad, so that if necessary the force can be localised to one particular spot and the danger of unnecessary water damage avoided. The ventilation flue, which is nearly everywhere found over the stage and can be easily opened, is considered a safeguard for the audience in the case of hydrants and sprinklers failing. The smoke and the fumes will be drawn away from the auditorium. The danger of having ventilators is the possibility of their being opened too soon, say before any water has been brought to play on the fire. The flames would then be fanned and the spread facilitated. The divisional curtains are everywhere introduced abroad, and at present the only question ever raised is as to the advisability of having double curtains, either in form of second asbestos protector or a water sheet. Without a ventilation flue over the stage the curtain will be pressed into the auditorium by the expansion of air on the stage. To my mind it is almost useless to lower a curtain without having this flue. It is true that I have not seen a curtain "blown out," but experiments were made at Vienna with a model of the unfortunate Ring Theatre, and the "blowing out" repeatedly proved within about twenty seconds of the fire obtaining a hold. As in the case of stage appliances, I unfortunately cannot enter into detail as to the construction of iron curtains abroad, but those interested will find drawings of some of the latest examples. The following four stages are fully illustrated:—

Buda-Pesth National Opera House, engineers, The Asphaleia Co. (Vienna).

Halle Municipal Theatre, engineers, The Asphaleia Co. (Vienna).

Vienna Hofburg Theatre, engineer, Herr Brettschneider (Vienna).

Rotterdam Municipal Theatre, engineer, Herr Rosenthal (Cologne).

The first two show the original Asphaleia system, the third improvements by Herr Brettschneider, and the last a simple adaption of the old wooden stage to modern resources.

Stores and Dressing-rooms.—The only thing remarkable about the stores abroad is the ample space allowed, both where the main stores are in the same block as the audience, and where there is only a secondary store and the main storage is outside the building. Where main stores are inside there is always a double wall, some 4 feet apart, between the stage and the stores, to prevent spread. In some cities the main stores have to be outside the building. This, of course, means much wear and tear and extra labour for the management. The St. Petersburg and the Paris theatres have very extensive buildings for storage purposes only. You will find the plan of one of the St. Petersburg stores on these walls. Besides enormous quantities of scenery it holds some 135,000 costumes and 20,000 pieces of armour.

Dressing-rooms are generally well arranged on the Continent, but the absence of bath-rooms is remarkable. The lavatory accommodation does not come up to our requirements. One thing has always been forgotten in continental dressing-rooms as regards the safety of the employées, and this is the proper arrangement for heating curling-irons and paint, though very practical electric appliances have been invented. I remember a case at Berlin when a Gaiety Company was there. The young ladies had a special liking for antediluvian spirit-lamps, candles and other curious arrangements of the most dangerous kind, which in every way annulled the advantages of good construction, electric lighting and the absence of drapery in the dressing-rooms. The Gaiety girls would not listen to reason—in fact, whenever their dressing-rooms were inspected, they simply formed a ring and danced round and worried the officers, so that the latter were only too glad to let the matter drop. I should recommend the necessary electric appliances for curling-irons and paint to be provided as fixtures.

A PEOPLE'S THEATRE.

And now, gentlemen, I must close with a few remarks on a people's theatre. You see the drawings of the Worms Theatre, built from the designs of Herr March, of Berlin. When the building was put up Worms had 23,000 inhabitants; that is to say, as many as Winchester or Reigate of our provincial towns, or Gravesend and Richmond of our London suburbs. Worms wanted a theatre. Everybody in the town was ready to sub-

scribe and the Town Council also found that a little money could be taken from the rates. Everyone was satisfied if the playbill was limited to drama, and it was immaterial if the pieces were put on to the stage with a full *mis-en-scène* or only the indication of the surroundings I referred to. There is a good deal of democratic spirit in Worms, and hence a distinct division of an audience into sections would not have pleased the inhabitants. The best men of the town were to have the best seats, but they were not to be isolated. An assembly-hall was also required in the town, and as a combination of the two buildings meant a saving both of the initial outlay and the maintenance, a block not unsimilar to those of the national societies I just spoke of was decided on. The plans explain themselves. The Bayreuth system of seating was adopted, the lines only being more curved, which does not make it so oppressive for an audience as in the Wagner Theatre. The best seats have a central position. All use the same entrances, the same lobbies and the same cloak-rooms. The best seat costs 3s. 6d., and the front rows, which are rightly considered to be the worst, 6d. For chamber drama the stage is used with a simple indication of the surroundings; for grand drama there is a full *mis-en-scène*. The stage has a depth of 27 feet when measured from the front of the platform to the back wall, and its width is 48 feet. These dimensions will be found to be between those of the stages of our Haymarket and Daly's Theatres. There is no orchestra well. An organ has been placed at the back of the auditorium, where there is also a gallery for a band or a choir if necessary. Exclusive of the seating accommodation in the gallery, there is room for an audience of 1,200, or with it for 1,400. The auditorium already looks well filled with an audience of about 800 or 900. Again, I cannot go into detail, but I would mention that the audience has thirty-three exits at its disposal, and that the auditorium has a large central top-light, so that the hall can be used for public meetings in the daytime, and the cleaning is greatly facilitated.

As to the cost, the whole establishment, theatre, assembly-hall, restaurant and grounds, with all necessary furniture, fixtures, and a sufficient supply of scenery to start the management, would cost 610,000 marks, or 30,500*l.*, which, with the prices of labour and materials in this country and the higher value of ground, would mean about 40,000*l.* The 30,000*l.* were collected as follows:—First, there was mortgage money to the extent of 7,500*l.* on the property, lent by the Municipal Bank at 3½ per cent. The interest for this mortgage can be easily covered by the refreshment contractor's rentals, who has the monopoly of catering in the place. Then 11,500*l.* were collected by voluntary subscription; 5,000*l.* were allowed by the Town Council, and the remaining sum made up out of the proceeds of bazaars, lotteries and such like amusements. The Town Council undertook the maintenance of the property.

And now, gentlemen, that I have finished my paper, may I ask if municipal, subscription and people's theatres should not be encouraged by architects as buildings which lend themselves to architectural treatment in the best sense? Shall we really soon see this class of building in our country is a second question. Will institutions of this kind find favour? And lastly, gentlemen, can we structurally improve upon our private theatre of to-day by studying what has been done abroad under different circumstances?

Mr. R. ROBERTS expressed himself in favour of municipal theatres, but he doubted if English people, who were not an artistic people, were yet sufficiently educated to appreciate them. He thought the County Council would subsidise a scheme for municipal theatres. In theatre construction the first object should be the safety of the public. He preferred perfect isolation for theatres, but owing to expense of site, &c., that was not practicable.

Mr. MULHOLLAND also favoured the idea of municipal theatres. Something of the sort existed in the provinces, but they were, however, the worst managed theatres in the country.

Mr. LEON thought people would object to pay the necessary rates for municipal theatres on religious grounds.

Mr. BLASHILL alluded to the ordinary rule in Germany, even in villages, that theatres should be isolated.

Mr. W. D. CARÖE said he thought sites were cheaper in Germany than here.

The proceedings closed with a vote of thanks to Mr. Sachs for his paper.

EVOLUTION OF AMERICAN ARCHITECTURE.*

WHEREVER humanity has wanted a tenement, a temple or a tomb, the desire has developed into a feeling extending beyond absolute need and more profound than individual caprice. In all ages the expression of this feeling has been wrought upon the anvil of necessity with the hammer of

* A paper read by Mr. J. W. Yost at the Convention of the American Institute of Architects.

human sentiment. Its expression has ever been true to the impulses of the human heart and has developed a glorious architecture under the spur of human aspiration. Every nation of history has welded into forms of beauty and harmony a knowledge of the past and a capability of the present. In the evolution of architecture in its various phases that which a period provided was what the past had used, recast in a mould of the present. Thus architecture became an art of precedence and a science of necessity.

While every people has written its own feeling in its own lines, the abstract principles which govern all architectural expression are universal and unchangeable. Details change and compositions vary with every fancy of the designer, but the influence of a line, a form or a colour remains the same everywhere. A straight line never has the influence of a curve; a vertical line never produces the effect of a horizontal line; a sphere never the effect of a cube, and red never the effect of green. Each element of design preserves its own influence throughout all composition and under all circumstances, like the letters of the alphabet in every production of poetry and prose.

In the title of this paper I have purposely excluded the words "order" and "style," both being too narrow in their present signification to express my conception of what the architecture of this country will be when its evolution has produced a homogeneity of expression. If the law which has governed the production of every variety of architecture throughout history is not to be set aside in the development of the architecture of this country, its character, when compared with that of all historic work, will be as broad as our civilisation is broad when compared with the civilisation of historic times.

No nation has heretofore existed possessing the multiplicity of wants we have. No people ever before possessed the personal freedom of taste and the ability to provide an expression for it that we have. No style of architecture has ever been produced under such a variety of climatic influences as this country affords. Never have the designers and the builders of any country had at their control such a varied supply of building materials and building appliances. Never have a people of any age or clime possessed such a complete knowledge of what all previous periods have done, nor had at their command such ready means of full communication with each other and with everybody else. Probably no nation of people was ever made up of so great a variety of races, nationalities and antecedent conditions as exists with us.

Gather together people from every nation of the earth, with their inbred fancy for the work of the mother country, supply them with means of comparison of what each likes with what all the others like, and with what the ancestry of all have liked, and then set before them the variety of materials and building appliances that all the world can supply, and let them express all their wants under all the conditions the country develops; then crystallise the whole result into a distinctive expression, and the word "style" must be greatly broadened in its signification in order to truly define the production. If anybody has expected to see, or has expected our posterity to see, in the architecture of this country something so exclusive as the Greek orders or even the Gothic styles, his expectation will probably never be realised.

There has been some impatience expressed because there has not been a final acceptance by the profession of some historic style as the key or starting-point from which our future design must be developed. There seem to be those who think if the profession would only agree upon some style as the best one for our purposes it could be adopted as the "American style," and all future work made to follow its lines, at least sufficiently near to be considered its legitimate offspring. Some of our professional schools, while doing an excellent work, have in some way been led into the idea that some particular type of architecture from a foreign country or previous age is better than all others, and capable if adapted reasonably of answering all requirements as the antecedent type of American architecture—but not all of the schools agree which particular type of architecture it is which should be thus selected. The criticism of the times is largely based upon a preference for one or another style, and endeavours to measure the merits of all work according to the ideas the favoured style expresses—often condemning excellent work as meretricious, and singing high the praises of well-copied nonsense.

The impatient writers, the leaders of schools, and the self-appointed critics must all come to know that we cannot, and will not, marry our architecture—which will be vigorous, beautiful and glorious—to an architectural mummy from Egypt, France, Italy, or anywhere else, no matter in what excellent grave clothes the mummy may have been enshrouded. It has required much time for the world to grow up to an appreciation of our civilisation, and it may require much time for us to fully appreciate the fact that our architecture must grow, and cannot be imported by foreign junk dealers. We cannot, if we would, rush to a conclusion in immoderate haste. Our art must have its proper season of development

under the law of the survival of the fittest, and when it has come to full fruition it will be just as noble, when compared with former work, as our civilisation is noble—no more and no less. We will not have all of the good things that all the past styles contain, but will probably have many more good things than any one of them contains.

In determining at any time what to do, a thorough knowledge of what has been done will furnish and must furnish the surest foundation on which original thought and novelty of expression can rest, but whoever is satisfied to use what he can find, without earnest inquiry whether it is possible to do something better for the time and place, has reached the last stage of mental growth and has built a wall of enclosure about his skill as a designer. That which comes to his mind as novelty and that which comes to his eye from history must be scrutinised according to the same rule of appropriateness. The fact that one has a precedent and the other has not furnishes no reason sufficient why either should be adopted or rejected.

In the evolution of a national architecture under the law of natural selection by the survival of the fittest and under the conditions prevailing in this country, we begin by the use of first one style, then another, and then another, always terminating the experiment by softening the lines of demarcation between them, just as the settlement of the country began, first with a colony from one country, then a colony from another, and then from another. All these colonies mingle and soon the special characteristics of each begin to disappear. Then comes another colony and mingles with the others, the new immigrants having less and less influence upon the whole civilisation, in proportion as that which has come under the new environment becomes greater and greater in proportion to what comes from abroad, until by-and-by the volume of American civilisation will be so vast in proportion to the importation of foreign influences that the importation will cease to be, in any appreciable measure, a disturbing element. The peculiarities of all the races and nationalities will merge into a newly evolved human entity known as an American. If architecture is true to its principles as a delineator of ethnographic life it must follow this same process of accretion, assimilation, of elimination and crystallisation, until out of the architectural styles of all the world there will come in its own good time an expression composed of all, yet different from all, governed by new requirements and limitations, and it will be known as "American architecture."

Mr. Gothic lands upon our shores, but under a different environment from that under which "Gothic" was born and reared. He soon becomes a "Gothic American," the same as an English immigrant soon becomes an English American. Then comes Mr. Romanesque, say from France, and must pursue the same course as the Frenchman; the one becomes Romanesque American and the other a French American. The same is true with all other styles of architecture and nationalities of people. The one finally disappears in the ocean of American citizenship, and the other will disappear in the ocean of American architecture. Each is simply following the laws of evolution, the same as all civilisation and all architectural expression has done in all the past. Neither can change the inevitable course of events.

So that while we begin to form a national architecture by following the fancy from one style of historic work to another, being wonderfully particular to have each style pure, we will end—that is, our posterity will end—by practically forgetting that there ever was such a thing as an "order" or a "style." All that comes under the pencil must pass the scrutiny of the highest and best that is possible. The hand must be unshackled, the mind unfettered and free.

While none of us will live to see American architecture in its glory, while we must live out our days in the shadowed valley of the dawning of American art, yet we may see the golden glow of the morning sun as it kisses the tips of the highest specimens of art the genius of our generation can produce.

While the imagination of people and foreign ideas of art is still at flood tide, yet both have reached and passed the zenith of their influence, and henceforward from one decade to another, as the civic and artistic conditions of this country become nearer and nearer to those of other countries, these foreign influences will become less and less potential. If this be true we have reached the time when crystallisation must begin.

In one century we have grown, politically, from a provincial to a national estate, and although our civilisation presents innumerable problems and requirements in architecture, hitherto unsolved and unanswered, yet taking into account the facilities we have and the activity of our people, it is fair to presume that in one century from this time our architecture will be sufficiently differentiated from historic and contemporaneous work to form a separate chapter—we may fairly hope, a large and important chapter—in the world's book of design.

In the production of an architectural expression with sufficient breadth to answer all the requirements of our civilisation,

it will be necessary that the designer shall know not only what other countries and times have done, but he must learn the language of the elements of which all design in architecture is composed. He must also learn what sentiments can be properly written in each class of buildings; and finally he must learn what he may properly use from all the field of historic art and from all the unappropriated realm of material forms for the embellishment of any given building or any given part thereof. Here, then, are three things to learn—first, how to design; second, what to design; third, what may be used for ornament.

The three parts of which all architectural art is composed have their separate offices of varying relative importance in the various classes of buildings. As the æsthetic adds refinement to the purely technic, so again the phonetic may be considered a refinement of the æsthetic.

Naturally, in a country like ours, inhabited by a people of excessive acquisitiveness, in an age of practical things where everything is weighed in the scale of its capability of supplying human comfort, the technic or purely constructive element of our architecture will assume an importance not often if ever before reached. But this paper is not intended to discuss the purely mechanical side of the question. That only which arises above the plane of the merely necessary is now to be referred to.

That branch of art which so disposes of what is necessary as to make it ornamental—that which beautifies utility but does not reach the realm of the symbolic or ideal—I choose for present purposes to term the æsthetic branch of the subject. Inasmuch as only a small proportion of our buildings will ever rise beyond this second stage of artistic development, anything like an extended discussion of the phonetic may properly be deferred until another time. Before dismissing the technic and phonetic branches of the subject, however, it may be proper to say that the technic and æsthetic conception of any building cannot rise to the highest attainment until it takes such form and finish as to provide for the harmonious introduction of phonetic embellishment—that the highest development in the technic and æsthetic in building art will invariably lead in the direction of the greater and greater importance of the phonetic, until there comes that balance of the beautified useful and its poetic adornment which measures the zenith of possibility in plastic art. Also that the subjects of phonetic ornament may be realistic, allegorical or ideal, either in history, prophecy or contemporaneous life; but the realistic must never be a copy of nature to the extent of being an imitation, nor the allegorical and ideal so far removed as to need explanation to the average beholder, and that all subjects must have a well-known connection with the particular building, or its class, if it be other than of a private nature.

Then we face the three questions, how to speak, what to say, and with what tongues we shall speak in the æsthetic element of our designs. A comprehensive answer to either of these questions would reach far beyond the limits of this paper. It is something of an aggravation, therefore, to even suggest them under the circumstances. We pass, rather than answer, them in what follows.

A few simple entities are all that we have in which to express whatever sentiment we are to convey through the æsthetic branch of our art.

Lines, surfaces, points, volume, light and colour—these constitute the letters of our alphabet. With their infinite capacity for combination and variation they make up an inexhaustible language. Each letter of this alphabet is capable of being used in countless compositions. Each has its influence and its office, and always speaks in the same tone under the same circumstances—in the same atmosphere so to speak.

What is the meaning of a horizontal line? of a vertical line? a curved line? or a comparatively short line, or a comparatively long one, or a uniformity of lines, or a variation thereof? Each has the same influence in all possible phases of design. Each has a sentiment to express, from which it never varies. A horizontal line always expresses breadth, stability, repose. A vertical line, altitude, mobility, aspiration. A straight line, force and severity. A curved line, gentleness and submission. Long lines, sublimity and grandeur; short lines, action and intensity. A variety of lines, refinement and control; a uniformity of lines, mystery and indecision. And so on through the limitless combinations of lines which make up the inexhaustible wealth of possible design. All have their place and their purpose. Every combination will receive more or less influence from the other elements of the design, yet they never lose their significance, even when overshadowed in the picture by the power of other features.

As it is with lines, so with forms and light and colour, each one of which stands for a given sound in the harmony of the complete composition. While no complete catalogue or dictionary of this language has ever been or ever can be written, and while the subject is an unbounded field for inquiry, yet a moderate acquaintance with the general outlines of the subject lies at the foundation of any true scholarship in matters of design. And while it is the cold abstract side of the question

that is thus presented, it is in this heartless dissecting-room that we must learn the office of each component of that aggregation of entities which we call a design. It is the analysis, the taking apart of the flesh, bones and sinews, so to speak, of this thing which impresses us with its beauty, grandeur, refinement or devotion—that will give us a knowledge of how we may compose other designs to tell the same or any other story we may have to tell.

Having learned how to express any given feeling, we are next confronted with the question of what feeling to express in any given building or class. The answer to this question no man can give until he knows what feeling and sentiment surrounds the erection and use of any given building. It will vary with every change of public sentiment. In this branch of the subject the architect must be a student of the times, of the community in which he builds, of the persons for whom he builds. He must be one of the people and a leader of the people in these matters, but he must not be separate from the people.

His building must express the sentiment of those for whom it is built rather than of the architect who designs it. The highest results are only attainable, however, when the architect and his clients are in the fullest sympathy.

There next arises the question of what forms can be used to beautify that which necessity has commanded.

For the present we will do, in the matter of ornamentation, what we do in the matter of style—that is, do as we please, each one for himself—doubting the propriety of new things and continuing to copy the old, as a rule. But it is not the present only that is under consideration, and the unlimited liberty of the present will, in time, be succeeded by an intelligent restraint.

Excluding ornament by setting precious materials and by the use of colour, there are three great systems which have been in use. They have been more or less combined in the ages and styles of the past.

First.—The use of conventionalised possible but unnecessary constructive forms. Triglyphs and dentils on a Doric entablature and wall arches in Mediæval work would illustrate this class.

Second.—The use of geometric and other forms as surface ornament to change the linear and volumar effect of the structure, the forms bearing no relation to structural requirements.

The Saracenic and oriental surface ornament—the foliage, panels and festoons of the Renaissance will illustrate this class.

Third.—The beautifying of real construction by the use of geometric forms and a lithic semblance of the forms of vegetable or sentient life the lines of which seem to lend assistance in the work the ornamented portion really performs. Moulded base and the acanthus leaf on capital of the Corinthian column illustrate this class.

These methods of ornamentation rise in the scale of artistic merit in the order in which they have been mentioned. The lowest grade of ornament in an artistic sense is the decorative use of needless constructive features. The next is the use of exterior forms to modify the emotional effect of the structure. The third and highest is the beautifying, geometrically or otherwise, of real construction; and in this class that is highest in which the best geometric form is clothed in lines of lithic life.

If the architecture of all history can form a criterion, it is probable that our ornament will continue to be composed of these three classes. In fact, it is some question whether to a nation of practical people, as we are, and will continue to be, so satisfactory results can be obtained by the exclusion of the lower orders of ornamentation as by the proper harmonising of them with the higher classes, somewhat as the Greeks did, so that we may maintain a scale of ascent from the purely technic, through degrees in higher art, to the purely phonetic. As the structural element of our buildings cannot be of gold, but must be of stone, brick and wood—more earthly materials—and as we ourselves are a combination of the spiritual and the animal, it seems but right that the art, in even our highest productions in architecture, should have a foundation upon the earth, and that on its nether side the artistic spirit should come as near to the material element of the structure as possible. It is fair to expect that the three grades of æsthetic ornament will be used in the perfected type of American architecture, when it shall come.

In the selection of subjects from the vital world, not only should those be chosen which, in their lines or forms, accentuate the spirit of the design in hand, but they should, so far as possible and whenever possible, have some appropriate connection with the building or its class and with the sentiment surrounding its use. In this respect our ornament, on its subjective side, should not appeal to the mythology of history so much as to the facts and feelings of the present day and of our own country.

The art of no age or country, whether of poetry, painting, architecture or sculpture, ever rose to commanding eminence

except when founded in the very nature of those for whom and by whom it was produced. If we would have American architecture rise to that enduring importance which will challenge the admiration of future ages we must bring ourselves up to a recognition of the fact that art is a precious treasure of unfathomable, inconceivable richness, which can neither be bought nor borrowed. We may inherit some scattering jewels from a provident ancestry, we may find some diamonds in the chaotic remains of historic times, but the brightest gems in our artistic crown we must bring up with much searching from the ocean of infinite possibility. In the development of our architecture we must rise above the limitations of any style or order to a position where we may not only compare all work of all the past with reference to its adaptation to the wants of this country and our times, but where we can go beyond the concretions of all times and glean from the broad field of nature in which all styles and orders grow, and where the sum of all that has ever been done is but as a sheaf in a whole harvest when compared with that which can be done.

FORESTRY OF BRITISH PLACE NAMES.

IN his speech at the Society of Arts on the 19th inst., after the reading of a paper by General J. Michael on "Forestry," Sir George Birdwood said:—

An innate, unfeigned love for woodland lore is instinctive in the whole Aryan race, which from its earliest migrations has been associated with that great forest belt once extended across the entire breadth of the Euro-Asian continent, of which the Black Forest in Germany, the Ardennes Forest in the North of France, and the remains of Andred's Wood in Kent and Sussex, and the New Forest in Hampshire, which once linked Andred's Wood with the Forests of Dartmoor and Exmoor, and the Dean Forest, are now isolated fragments. It was in this vast temperate forest belt, extending from the Himalayas, along the Caucasus and the Imaus and the Balkans, Alps and Apennines, to the utmost British Isles, that the ancestors of the ancient Hindoos and Persians, and Greeks and Latins, and of the modern Celts, Slavs and Teutons learned their common names for the alder, apple, ash, aspen, beech, birch, elm, hazel, holly, linden, maple, oak, pine and willow; and that the European Aryans learned to worship the oak as the king of the wood, and their highest god. From Dodona to Leatherhead—"the high oracular grove"—the oak was associated with the supreme god of the Aryans, either as his sanctuary or the godhead's self. The love of trees is as strongly marked in the British and Anglo-Saxons as in every other branch of the Aryan race. I have made out two lists of place names in Great Britain, the first being of places named after woods and clearings in woods and trees generally and parts of trees, and the second of places named after trees. The following places in Great Britain derive their names from British, Anglo-Saxon and Danish words signifying woods or groves, clearings in woods, trees generically, the branches, trunks, stems and boles of trees and timber. Thus, from the Anglo-Saxon beam, a tree, we have Benfleet, in Essex, Bampton, in Oxfordshire, and Bamford Speke, in Devon; and from the Anglo-Saxon treow, a tree, Treborough, in Somerset, and Treeton, in Yorkshire; from the Danish thufe, a branch, Tufton, in Hampshire; from the British bon, the bole of a tree, Bungay, in Suffolk; from the Anglo-Saxon bol, bole, Bolton, in Lancashire, and seven other Boltons, Bole, in Northampton, Newbold, in Derbyshire, and Bolingbrook, in Lancashire; from the Anglo-Saxon stib, bole, Stibbard, in Norfolk, Stibbington, in Hampshire, Steeping, in Lincolnshire, Stebbing, in Essex, and Stepney, in Middlesex; and from the Anglo-Saxon stoc, tree stock, stem, or trunk of a tree, over 100 names of places, including Stoke d'Abernon, in Surrey, Stogursey, in Somerset, Stoke Say, in Shropshire, and Greystoke, in Cumberland; from the Anglo-Saxon tymbre, wood, Timberland, in Lincolnshire, and Timberscombe in Somersetshire. From the British bar, a bush, we have Barcomb in Essex and Barlow in Derbyshire, and from the Danish bosch, a bush, Buscot in Berkshire and Bushey in Hertfordshire, and elsewhere. From the British coed, a grove or wood, we have Coed-Arthur, Argoed, Coyty and Disgoed, all in Wales; from the Anglo-Saxon bærw (compare British bar, a bush), a wood, a grove, Barrow in Leicestershire and elsewhere, Barrow-in-Furness in Lancashire, Barrowden in Rutland, Berrow in Worcestershire, Burwarton in Shropshire, Berry Pomeroy in Devonshire; from the Anglo-Saxonholt, a wood, *i.e.* hold of wild beasts, Bergholt in Essex; from the Anglo-Saxon hlyrst, a wood, over seventy names of places, including Hurstmonceaux and Billingham in Essex and Deerhurst in Gloucestershire; from the Anglo-Saxon wæald, or wild woodland, Weald Bassett in Essex, Woldingham in Surrey, Woldford in Warwickshire, Old in Northamptonshire, Old Castle in Herefordshire, and Oldberrow in Worcestershire; from the Anglo-Saxon scua, a wood, Shaugh and Shaugh-Prior in Devonshire, Shawbury in Shropshire and Shoebury in Essex; from the Anglo-Saxon wuda,

wood, Outwood in Lancashire, Woodsetts in Derbyshire and Sherwood in Nottinghamshire; from the Danish skeg, a wood, Skegby in Nottinghamshire and Skegness in Lincolnshire, and from the Danish toft, a wood surrounding a house, thirty names of places, as Toftwood in Suffolk and Norfolk and Toftmill in Durham. From the British den and denan, and Anglo-Saxon dene, a woody dingle, we have Hastingdene in Kent, Rottingdean in Sussex and the Forest of Dean in Gloucestershire (compare Devon, the "deep valleys," *deifneint*). The Anglo-Saxon plump, a clump of trees, gives its name to Plumpton in Sussex and Northamptonshire; and the Anglo-Saxon hleoðar or oracular grove to Leatherhead, "the high oracular grove." The old French word forest (from the Latin forestis, lying without, through the Low Latin foresta), signifying an open woodland (as distinguished from an enclosed one or park), in which the king's rights of the chase were reserved, is found in the names of Forest Gate in Essex, Forest Hill in Kent, Forest Row in Sussex and of the Forest of Dean in Gloucestershire, the New Forest, Hampshire, &c. Its association with hunting is seen in the name of the town of Huntly, "the land for hunting," on the borders of the Forest of Dean; and again in the names of several places near open woodlands compounded with the word chase, as Enfield Chase and Cannock Chase. From the British clawr in its Anglo-Saxon form, clere, a clearance in a forest, we have Clawrplwyf in Wales and High-clere and Kings-clere, both in Hampshire. From the Danish thwaite, meaning the same thing, we have upwards of forty names of places in Norfolk, Suffolk and other eastern and northern counties; from the Anglo-Saxon word royd, a road cut through a forest, Huntroyd and Mytholmroyd, both in Yorkshire; and, finally, from the Anglo-Saxon erwd, ploughed woodland, we have Erwood, or Erwd, in Breconshire, Wales.

The following places in Great Britain derive their names from the British, Roman, Anglo-Saxon and Danish names for special trees. Thus the alder gives its name from the British gwern to Vern (literally the Alders) in Herefordshire; from the Anglo-Saxon alar to Alresford in Hampshire, Alrewass in Staffordshire, Ellerton in Northumberland, Orleton in Herefordshire and Orleston in Kent; and from the Norse embla to Embleton in Durham and Emley in Yorkshire. The apple, in British æpl, apal and aval (Avalon) to Applethorpe in Nottingham and Appuldercombe in Devonshire. The ash, from the British onn, to Llwyn-onn, "the ash-grove," in Wales, to Machen (plural form) in Monmouthshire and the river Onny in Shropshire; from the Anglo-Saxon aesc to upwards of 120 places, including Axminster and possibly the river Exe (which is probably Usk, if Oxus and Oxford, water) and Exeter in Devonshire and Axbridge in Somerset; from the Danish aesc to Askrigg in Yorkshire, and to several places called Askham in Nottingham, Yorkshire and Westmorland. The aspen, from the Anglo-Saxon aeps, to Epsom in Surrey, Epworth in Lincolnshire, and probably Ipswich in Essex, and from the Danish asp, to Apsley-Guise in Bedfordshire and Aspeden in Hertfordshire. The elm gives its name to nearly forty places, including Helmshore in Lancashire, Helmley in Yorkshire and Helmdon in Northamptonshire. The beech, from the British fedw, gives its name to Llwyn-y-fedw in Wales (it seems to lurk also in the later etymology of Hereford), and from the British bæcen (beeches) to Beckenham in Kent and Beckingham in Nottinghamshire; and from bæce (beech) to Bixton and Bickleigh in Devonshire, Bicknor in Monmouthshire, Bicker in Lincolnshire, Beecham Well in Norfolk and Burnham Beeches in Buckinghamshire; from the Anglo-Saxon boc to Bocking (bocen, "the Beeches") in Essex, Bockleton in Herefordshire, Boxford in Suffolk and to Buckinghamshire. The birch, from the British bedw (compare fedw, beech), gives its name to Bedwely in Monmouthshire and Beddow in Shropshire; and from the Anglo-Saxon birce to Birchington and Birchholt in Kent, Birkham in Nottinghamshire and Berkeley in Gloucestershire. The cherry, from the Latin cerasus, has been thought to give its name to Cherry-Hinton in Cambridge, to Cherhill in Wiltshire and to several places called Cheriton. The hawthorn gives its Anglo-Saxon name to nearly 100 places, including Tring in Hertfordshire and Thurning in Norfolk. The hazel, from the British celli, gives its name to Pencelli and Tregelli in Wales; and from the Anglo-Saxon hæsl, to Haslingdene in Kent, to Hesse and Heslington in Yorkshire, Haslingden in Lancashire and Hesley in Warwickshire, and elsewhere. Nutfield in Surrey, Notting Hill in London and Notgrove in Gloucestershire are called after its nut. The holly, from the British celyn, gives its name to Cwm-celyn in Monmouthshire, the Chin river and Chingunford in Shropshire, to Callington in Cornwall and Calne in Wiltshire; and from the Anglo-Saxon holegn to Holne in Devonshire, Hollington in Sussex, Olney in Buckinghamshire, Hollesley in Suffolk, and Alnwick in Northumberland. The linden or lime gives its Anglo-Saxon name to Lindsell in Essex, Lyndhurst in Hampshire, and Lindridge in Worcestershire. The maple gives its Anglo-Saxon name to Maplebeck in Nottingham, Maple Durham in Oxfordshire, Mapleton in Derbyshire and several other places. The oak, from the most ancient British dar

(compare darwydd, "druid") gives its name to Darlin, in Monmouthshire, and, indirectly, to Redruth, the "Druids' town," in Cornwall; and from the Saxon æc, to Acton in Middlesex, and elsewhere (eight places all so called), Acaster, Acklam and Ackworth in Yorkshire, Acomb in Durham, Acrise in Kent, Green Cryse in Herefords hire (where its corn or "seed" gives its name to Acornbury, as in Wales it does to Festiniog, the "acorn-land" of Merionethshire), to over twenty places called Oakham, Oakington and the like, and to about six places in which oak becomes oc or ock, as Occold in Suffolk, Ockbrook in Derbyshire, Ocle in Herefordshire and Okeover in Staffordshire. Glastonbury is called after the British name glastennen, of the helm oak; Berkshire takes its name from the polled ("pollard") oak, under which the shiremoties of that county were anciently held; while the name of Sherwood is similarly derived from the oak (here generically wuda), under which the shiremoties of the county of Nottingham were wont to assemble. The pear gives its Roman name to Purley, Purleigh and Pyrford in Surrey, Parndon in Essex, Parham in Suffolk and Paracomb in Devonshire. The pine gives its Anglo-Saxon name to Pinner in Middlesex, Pinefern in Dorset, Pinhoe in Devon and Punctestown in Wales. The plum gives its Anglo-Saxon name to several Plumsteads in Norfolk and elsewhere, and to Plumbland in Cumberland. The privet gives its British name yswydd to places in Wales, and, finally, the willow gives its several Anglo-Saxon names, purs, sahl, wil, windle and withig, respectively to Pershore in Worcestershire, Soho ("Willow Hill") in London, Soham in Cambridgeshire, Salehurst in Sussex, Saul in Gloucestershire, Salford in Lancashire, Soulbury in Buckinghamshire, Souldern in Oxfordshire, Willoughby in Lincolnshire and elsewhere, Windle in Gloucestershire, Windsor in Buckinghamshire, and a dozen Withams, Witherns, Withingtons and the like, in Suffolk, Lincolnshire and elsewhere.

You will observe that there are about 500 such place names, and what is so remarkable is that the trees thus toponomically commemorated are, with the possible exceptions of the cherry and the pear, all trees which were the indigenous forest trees of these islands before the invasion of Julius Cæsar; and the very trees I have already cited as having a radically common name among the principal Aryan races. It proves how trifling has been the influence on the Aryans of the 2,000 years of their civilised history in comparison with that of their 15,000 to 25,000 savage history, which some would indeed extend to 50,000 years. The Romans are generally supposed to have neglected the administration of the forests in these islands. Still they would appear to have added the box, the sycamore and the laurel to our woods, and the cherry, pear, medlar, quince, mulberry, fig, damson plum, vine, chestnut and walnut to our orchards and homestead plantations, and they thus immensely and permanently increased the horticultural productiveness of the country. There is positive evidence of the care for our forests shown by the Anglo-Saxons and Danes. One of the Saxon kings instituted a fine of 60s. for burning a fire in any wood, "for fire is a great thief." Canute levied a fine of 20s. on anyone cutting brushwood without permission or destroying trees and shrubs used as fodder for cattle, and in every county during the Norman times the sheriff was made accountable for the conservancy of all woods. From Domesday Book and the "Codex Diplomaticus" a very good idea may be obtained of the extent of the contemporary forests in Great Britain, and the general conclusion one comes to from the survey is that there is no country in the world which would better repay sound and systematic conservancy than these British islands. They seem to afford a kindly home to every robust timber tree and temperate fruit tree and hardy flowering plant. They are, indeed, one of the world's great natural paradises. Where we have lost our forests it has been through sheer stupidity; the most terrible example of this being the disappearance, in greater part, of the famous Andred's Wood, which once covered all the waste lands of Kent, Sussex and Surrey, and extended along the "Saxon shore" into the present New Forest, in Hampshire, but was almost totally destroyed in the seventeenth century by the reckless iron smelting then carried on in our south-eastern counties.

HIGH BUILDINGS AND GOOD ARCHITECTURE.*

I HAVE been invited to speak upon the subject of lofty buildings, from an artist's point of view. I hesitated to accept, because in general I believe it is better to work than to talk about working. Work is so much more and higher than words. And yet a comparison of views among us who are all workers may be mutually helpful. There is but little to be said upon this subject which has been assigned me, but I may hope at least to suggest a few things which will invite discussion.

* A paper by Mr. Thomas Hastings, read before the Twenty-eighth Annual Convention of the American Institute of Architects.

I will not venture to discuss the propriety of erecting such high buildings or the municipal laws that should limit their height, because that aspect of the question has been assigned to another; but I will only express my own personal convictions upon the subject.

I believe that there should be rational limitations for all buildings constructed solely for revenue. This is required by practical and sanitary considerations. From an artistic point of view my subject permits me to argue that there is nothing more unfortunate in the general aspect of a city than the necessarily broken sky lines of our streets, because of there being no legal limitation as to the height of buildings. It is almost discouraging to spend one's energies upon 50 or 100 feet of an avenue or street, when, however good the result in itself may be, we are only making a blot upon the *ensemble* of the general line of building. Legal limitations would give us that monotony so essential to the general appearance of a city, and also so essential as a background for exceptional monuments. In such a company as this it is not necessary for me to do more than allude to the rigid building laws existing in other countries than ours, in order to explain the charming unity and monotony which exist in the streets of the principal foreign cities.

Modern life and habits, modern inventions, the modern industrial and commercial spirit, perfected systems of lighting, ventilating and heating, the elevator and other practical conveniences, have of necessity imposed upon the architects of our time a new and serious problem to solve. This problem must confront us even if legal authorities finally fix a limitation as to height or number of storeys; for such a limitation can only simplify the problem and not eliminate it. It must, therefore, be solved in an artistic way. To contend that this one problem, resulting from the industrial and commercial spirit of the age, must, as has so often been assumed, determine and transform all modern architecture, is unquestionably an exaggeration. The architect of our time has practically the same civil, domestic and religious problems to solve in their many and varied forms which have been given his profession ever since classic times. The variety of problems only increases as life expands and differentiates, as is noticeable when we study the history and development of architectural style. The mere theorist is apt to make too much of what he calls an "entirely new state of affairs," and so becomes revolutionary in questions of design. The office building is only one step further in the general advancement. With the many difficulties before us, while endeavouring to design a lofty structure, we must not be discouraged, but only try to build in the most natural and logical way, adapting all precedents to this one new condition.

Before suggesting any solution of the problem, allow me to say it is both easy and permissible for me, as well as for all of us, to preach better than we have been able to practice, especially when such difficulties are before us as baffle all education and demand experience which involves failures. Therefore, I beg those of you who are familiar with any work of this kind in which I have participated, not to allow what I have done to prejudice you against any suggestions which I may be able to make concerning this matter.

It would seem as if nature had come forward to provide us with comparatively new materials in iron and steel to assist us in this new kind of work. That these materials should play a most important part in our designing it seems to me must be accepted. Our building laws, instead of hindering the architect in his design, should assist him more than they do by being properly revised. Some practical solution should be devised which would permit the use of apparent iron construction within the spirit of our laws. We might use exposed iron in a partly decorative way to indicate the constructive members which are concealed of necessity for fireproof reasons. I cannot imagine a more natural and beautiful solution than to treat these iron and steel constructions with curtain walls, by honestly showing the iron or steel on the façade, with a filling-in of terra-cotta, brick or faience, with projections constructed in apparent iron and terra-cotta. But such a solution is even more difficult to talk about than to execute. If the laws should be revised, as suggested, we could only wait for someone capable to experiment in this direction.

Let us now consider the artistic treatment that is possible under existing legal conditions. The utilitarian problem which confronts us is simply a beehive or manifold collection of similar cells with equal divisions, both lateral and perpendicular. As in all architectural study our façades should, as much as possible, interpret this interior condition of things. In order to do this there are but two principles of design which suggest themselves. One is to build a façade and to pierce it with windows equal in size and distribution, leaving equal wall-surfaces to be decorated with ornament and detail. But this would not be an artistic solution, for it is simply giving up all endeavours to meet the difficulty—for architecture should demand first of all that we know how to make openings in a wall so as to have a proper and agreeable relation between them, and to leave well-proportioned wall-surfaces. Shadows

from projections are always secondary to the deeper and larger shadows that these openings produce, and of still less importance are the lights and shadows obtained by ornament. An equal distribution of openings with ornament may be decoration, but it is not architecture. It is, as it were, decoration applied to a treatment legitimate only for light wells and rear yards—a checker-board arrangement. Any good architectural building must always look well, and be interesting to the architect when seen either at a distance or by moonlight or twilight, when only the main masses are apparent. The other principle in design is that of unequal division. To secure this, which seems to me to be the true principle, *i.e.* a large opening in contrast with a small one, or the grouping of openings together, and the proper colour and variety in wall surfaces, we must of necessity resort to combining some storeys in one *motif*. In so doing, instead of filling in these large *motifs* with stone divisions, is it not more rational to allow the steel, iron, or other construction of the interior floors and partitions to be apparent, instead of entirely masking them with masonry in the façade and destroying the true value of the openings? That is to say, is it not more rational to accentuate the *motif* by filling in with some other material different in character and colour, rather than with a pierced wall of stone? Such apparent iron construction in these *motifs* should then be treated or decorated in that light and delicate way which the nature of the material would seem to demand. This would give the composer almost absolute liberty in applying the same great principles of composition as obtain in other problems.

With such difficulties at hand, we must more and more demand from the critics and the profession alike an absolute freedom from all narrow and biased prejudices. Taste is a matter about which there are many perverted ideas. People are more sensitive about questions of taste than about almost anything else. I really believe that there has been more rubbish written in this relation than in politics or religion. Every man's taste, like his orthodoxy, is personal. It belongs to himself and to nobody else. It is therefore a very presuming thing to condemn a work of art because it does not happen to accord with your taste. Think first of what the artist has endeavoured to do, and then how he has done it. We hear men say "we know what pleases us"—but it surely requires but little taste to know that. I have heard men who called themselves architects condemn the best portions of the Louvre and other great works in architecture, because of their petty prejudices and their little formulas of good taste. They write or dogmatise in a way that is sometimes very persuasive, using superficial arguments, and perhaps applying some well-known principles, without being able to recognise the exceptions. It is difficult, in fact, to determine the difference between a prejudice and a principle. We must no more mistake prejudices for principles in art than in life. We should not be too outspoken about our prejudices, but should make proper allowance for our temperaments. Some men have so much conceit that they do not hesitate to condemn *in toto*, because of their little prejudices, works of art which have been considered masterpieces alike by artists and by an intelligent and admiring public for centuries. They write critically not only about individual buildings, but they decry entire epochs in the history of art. We must demand freedom from this.

Some men would fain settle the height and projection of a cornice before taking their pencil in hand. The pilaster need not of necessity be a buttress; a cornice need not of necessity crown the entire height of a building, simply because of the etymology of the name; this especially when the building is so high that no reasonable projection could crown it or be weighted enough to be held in place without iron. Webster and Worcester are not criteria in architecture. A pediment need not necessarily receive a roof because it was originated for this purpose. Even broken pediments, so much deplored by Purists, have been built by the greatest of artists. They cannot be said to be bad when they compose well and look well. The masterpieces of architecture of all ages contradict such theories and show them to be prejudices. While we can refer to such precedents we need not fear to build attics or to decorate with pilasters and pediments, if they look well.

The story is told of Haydn that a pupil brought to him one of the master's compositions and asked him if certain sequences were not wrong or contrary to the rules. Impatiently the master replied, "Yes, but they sound well." If a design looks well, it is well. Of course such freedom should not be carried so far as to become license.

It is right to be logical, but a work of art was never beautiful solely because logical. The most difficult thing in composition, and I believe this to be true in all art, is to know how to be simple—to be simple without being stupid and empty; to be firm and strong without being hard and angular; to have good detail, which on the one hand does not assert itself to the injury of the composition, and on the other hand is not timid for fear of a want of refinement. When a man has acquired a certain knowledge of his art, timidity is almost as bad as

vulgarity or brutality, and weakness as unpardonable as coarseness.

Therefore, in solving this exceptional problem, the "high office building," we must demand, while holding to precedents and traditions as much as possible, perfect freedom in composition, and, above all, avoid copying or adapting entire *motifs* or parts of other buildings that we have seen to these new conditions. We must compose and not copy. Only in this way will the new problem play its part among the numerous and varied other conditions of our life to influence modern architectural style in its further development.

New conditions have always demanded of contemporaneous architects a modern architecture expressive of the times, and every honest solution of this new and most difficult problem should be allowed to have its proper and natural influence upon our architecture.

GLASGOW ARCHÆOLOGICAL SOCIETY.

AT the monthly meeting of the Glasgow Archæological Society, held in the rooms, 207 Bath Street, Mr. P. Macgregor Chalmers, F.S.A.Scot., read a paper on "An Outline of Mediæval Church Architecture in Scotland," in which he traced the development of ecclesiastical art from the Roman period to the middle of the sixteenth century, when Classic art was revived. By giving views of actual examples he showed that the current opinion regarding the early structure of the Glasgow Cathedral was not in accordance with the stages of development. The early structure had only hitherto been shown to exist in the south aisle of the crypt, whereas he pointed out that there was a very large portion of the early structure still existing in the north aisle, giving a clue to the early plan of the cathedral. By this theory the early building was shown to be on similar lines to all the ecclesiastical buildings of Scotland of the same period. The paper was illustrated by a series of photographic views.



Mill Chimneys.

SIR,—After reading of the fall of so many mill chimneys during the recent storm and the consequent loss of both life and property, one cannot help regretting that such structures are still being put up, but this likely arises more from lack of knowledge than anything else.

Some little time back a design was invented somewhat on the lines of the Blackpool Tower, which has so well withstood the terrific winds of last week.

Briefly put, it consists of three lattice girders on end, tied into a bed of concrete and bound together, with an iron plate tube in the centre, which is lined about 12 feet up with fire-clay.

The patentee claims it is cheaper and quite as durable as those of brick or stone, while it is free from many of the dangers to which the latter are subject.

It can be run up any required height and will not fall, and any weakness caused by accident or carelessness is easily detected, which is not so in the case of brick shafts.

I shall be glad to supply any further information.—Yours truly,

RICHARD L. KIRLEW.

56 Clarendon Road, Manchester, S.E.:
December 26, 1894.

GENERAL.

Mr. Arnold Mitchell will deliver the Christmas course of three lectures for juveniles at the London Institution on Friday (to-day), the 28th; Monday, the 31st inst.; and Wednesday, January 2, at 4 P.M., on "English Cathedrals" (illustrated).

The Queen has approved the appointment of Mr. Frederick York Powell to be Regius Professor of Modern History at Oxford University, in succession to the late Mr. J. A. Froude.

Plans have been approved by the Kilmarnock Town Council for an extension of the waterworks at an outlay of about 5,000*l.*

The Surveyors' Institution will hold the next ordinary general meeting on Monday, January 7, when the adjourned discussion on the paper read by Mr. William Sturge (past-president) at the last meeting, "The Burdens on Real Property and Land," and on the paper by Mr. A. Dudley Clarke on "The Incidence of Taxation on Land," will be resumed.

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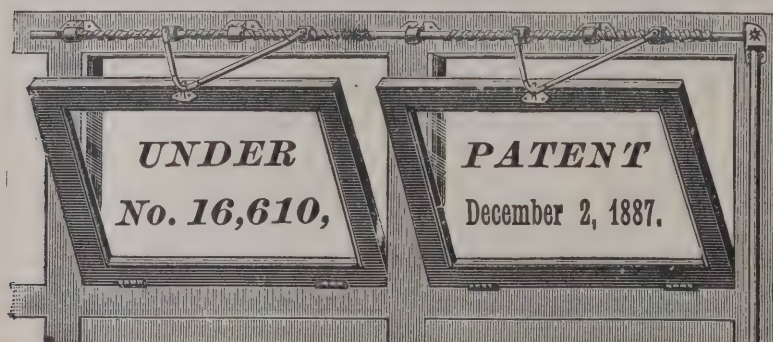
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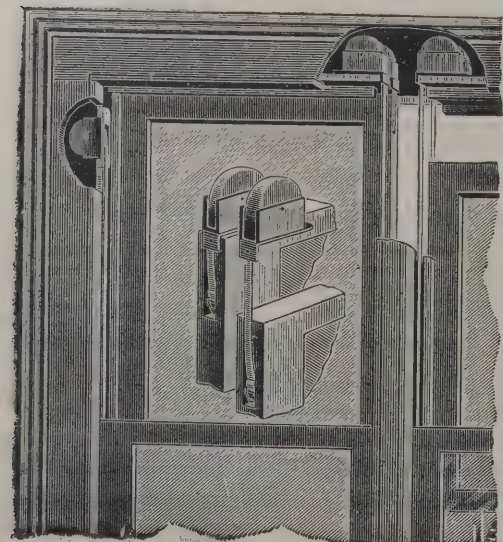
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Earl & Briggs, Melbourne	6,478	0	0
T. Philbrick, Leicester	5,984	16	7
T. Smart, Nottingham	5,700	0	0
W. T. Hall, Rugby	5,590	0	0
J. Holme, Leicester	5,510	6	7
Moss & Son, Loughborough	5,480	0	0
J. MASON, Belgrave, Leicester (accepted)	5,407	8	6
Engineer's estimate	5,385	0	0

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Latham & Co., Huddersfield	305	0	0
J. Foster & Sons, Preston	300	0	0
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Stevenson & Co., Limited, Preston	285	0	0
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ningley	270	0	0
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H. Lovatt, Wolverhampton	8,000	0	0
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R. Kershaw, Burton-on-Trent	7,555	0	0
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* Accepted, subject to approval of Education Department.

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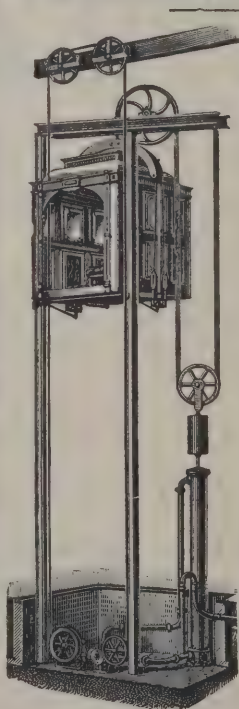
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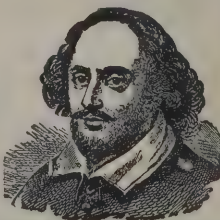
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For Painting, &c., at the City of London Union, Homerton, for the Guardians. Messrs. HAMMOND, Architects.		
Lidstone	£2,900	0 0
F. & F. J. Wood	2,755	0 0
Larke & Son	2,754	0 0
J. & H. Cocks	2,700	0 0
W. Shurmur	2,673	0 0
W. & H. Castle	2,398	0 0
For New Premises at Backchurch Lane, Whitechapel, for Messrs. Kinloch & Co. Mr. H. H. COLLINS, Architect.		
Paramor	£26,663	0 0
Sparks	26,296	0 0
Holland & Hannen	26,190	0 0
Grimwood	26,120	0 0
Clarke & Bracey	26,000	0 0
Mowlem & Burt	25,929	0 0
T. Rider & Son	25,838	0 0
T. Boyce	25,800	0 0
Foster & Dicksee	25,789	0 0
Colls & Sons	25,480	0 0
W. Downs	25,480	0 0
Lascelles & Co.	25,470	0 0
W. Shurmur	25,380	0 0
Ashby & Horner	25,265	0 0
F. & F. J. Higgs	24,873	0 0
Lovatt	24,853	0 0
Lawrence & Co.	24,369	0 0
Patman & Fotheringham	24,171	0 0
J. & J. Greenwood	22,860	0 0
For Cottage Homes at Hornchurch, for the Guardians of St. Leonard's, Shoreditch. Mr. F. J. SMITH, Architect.		
Holloway Bros.	£8,900	0 0
Wells	8,827	0 0
Stimpson	8,750	0 0
White	8,485	0 0
Allen & Son	8,365	0 0
Charteris	8,200	0 0
W. Shurmur	8,190	0 0
Killingback	7,997	0 0
Todd	7,870	0 0
Ivory	7,445	0 0
Rons	6,790	0 0

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LONDON—continued.

For Erecting Workshop at Mare Street, Hackney. Mr. J. HAMILTON, Architect.			
Barrett & Power	£469	0	0
Hayworth & Son	465	0	0
W. Shurmur	432	0	0
Rayner	420	0	0
G. W. Beale	415	0	0
G. T. Blow	409	0	0

For Repairs, &c, at St. Paul's Church, Canonbury, N. Mr. F. W. LANE, Architect.			
Kerry & Hollidge	£897	0	0
Quartermain	780	0	0
Kilby & Gayford	714	0	0
Allen & Son	680	0	0
Patman & Fotheringham	652	0	0
W. Shurmur	639	0	0
G. S. Williams & Co.	607	0	0
Wontner, Smith & Co.	595	0	0
J. Grover & Son	572	0	0
McCormick & Co.	566	0	0
Dove Bros.	535	0	0
M. Boller	486	0	0

For New Premises at Golden Lane, E.C., for Messrs. Bean & Co. Mr. R. W. Price, Architect.			
Sparks	£3,065	0	0
W. Shurmur	2,997	0	0
Marten Taylor	2,900	0	0
J. Smith & Son	2,847	0	0
Patman & Fotheringham	2,781	0	0

NEWBURY.

For Alterations and Additions to St. Mary's Schools, Speenhamland. Mr. JAMES H. MONEY, Architect, Newbury, Berks. Quantities not supplied.

Exclusive of Heating Apparatus.

G. Elms	£548	0	0
A. H. Houghton	539	0	0
James & Son	499	0	0
S. ELLIOTT (accepted)	498	14	10

NORTH GREENWICH.

For the Erection of a Mission Building in West Ferry Road. Messrs. J. E. K. & J. P. CUTTS, Architects.			
Lathey Bros.	£2,287	0	0
A. Porter	2,177	0	0
Holloway Bros.	2,175	0	0
J. H. Johnson	2,127	0	0
Harris & Wardrop	2,100	0	0

OBAN.

For Formation of Esplanade and Sea-wall, Oban. Mr. ALEXANDER SHAIRP, Engineer.			
W. G. Flett, Strathlea, Lenzie	£1,917	0	0
T. McEbrov & Co., Bath Street, Glasgow	1,698	0	0
D. & J. McDougall, Oban	1,299	0	0
J. Adam & Son, 6 Dixon Street, Glasgow	1,295	0	0
G. MCKAY & SON, Carnoustie, Broughty Ferry (accepted)	1,275	0	0

PENTWYNMAWR.

For Building Six to Nine Cottages, Pentwynmawr, near Newbridge, for Mr. T. M. Phillips.			
C. F. Morgan, Newbridge	£1,582	0	0
E. Williams, Newbridge	1,530	0	0
Davies Bros., Abercarn	1,485	0	0
J. Lewis, Croydon Cottage, Pontymister	1,394	0	0
A. RICHARDS, Newbridge (accepted)	1,340	0	0

TAVISTOCK.

For Sewage and Sewage-disposal Works, Tavistock, for the Guardians. Mr. H. MASTERTON, Engineer, 1 Buckland Street, Plymouth.			
E. Duke, Plymouth	£2,026	18	8
Matcham & Co., Plymouth	1,990	0	0
J. Fisher, Millbrook	1,752	0	0
J. Julian, Truro	1,466	0	0
G. Shellabear, Plymouth	1,450	0	0
W. H. R. Hill, Plymouth	1,386	0	0
W. C. Shaddock, Plymouth	1,327	0	0
H. Weldon, Birmingham	1,274	8	10
J. SHADDOCK, Plymouth (accepted)	1,205	16	9

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Siddons & Freeman, Oundle	£2,898	0	0
S. & W. Pattinson, Ruskington	2,878	10	0
J. Crawtham, Skegness	2,695	11	0
B. Hibbitt, Alford	2,595	14	0
T. Elmes, Wainfleet All Saints	2,296	18	6
J. T. TURNER, Wainfleet All Saints (accepted)	2,226	10	0

STOCKTON-ON-TEES.

For Enlargement of Post-office, Stockton-on-Tees, for the Commissioners of H.M. Office of Works and Public Buildings.

F. Chapman, Middlesbrough	£3,005	0	0
W. Ives & Co., Shipley	1,820	0	0
Johnson & Hanby, Stockton-on-Tees	1,683	0	0
Craggs & Benson, Stockton-on-Tees	1,561	0	0
W. C. Atkinson, Stockton-on-Tees	1,558	7	9
J. DAVISON, Stockton-on-Tees (accepted)	1,534	13	9

TEDDINGTON.

For Building Baptist Church, Teddington. Mr. JOHN WILLS, F.S.S., Architect, Derby.

Holliday & Greenwood, Brixton	£3,443	0	0
Higgs & Hill, South Lambeth Road, London	3,398	0	0
J. F. Collinson, Teddington	3,206	17	0
W. H. Gaze, Kingston-on-Thames	3,159	0	0
W. Johnson & Co., Limited, Wandsworth Common	3,135	0	0
Walker & Slater, Derby	3,040	0	0
J. Pillar & Sons, Teddington	2,994	0	0
D. STEWART, Wallington, Surrey (accepted)	2,918	0	0

THEYDON BOIS.

For Alterations and Additions to the Theydon Bois Parochial School. Mr. JAMES WINTER, Architect, Epping.

Palmer Bros., Epping	£360	0	0
White & Son, Bow	332	0	0
W. Laurence, Waltham Abbey	298	0	0
W. Pavay, Winchmore Hill	295	0	0
T. KEEN, Theydon Bois (accepted)	245	0	0

THORNHILL LEES.

For Building Four Scullery Houses, Lees Moor Road, Thornhill Lees. Mr. REUBEN CASTLE, Architect, Westgate Cleckheaton.

Accepted Tenders.

E. Wilcock, mason	£475	0	0
R. Dixon, joiner	126	0	0
G. Page, plumber	20	0	0
G. Fawcett, Dewsbury, slater	32	10	0
Kitchingham & Kaye, Heckmonwike, plasterer	28	0	0

TONYPANDY.

For Erection of School Buildings, for the Ystradyfodwg, School Board. Mr. J. REES, Architect, Hillside Cottage, Pentre.

Charles Bros.	£7,042	0	0
A. Richards	6,600	0	0
D. Evans & Son	6,550	0	0
C. Jenkins & Son	6,540	0	0
W. Williams	6,500	0	0
MORGAN & WILLIAMS (accepted)	5,860	0	0

WALTHAM CROSS.

For Erection of Shop, &c., at Waltham Cross. Messrs. WIGG, OLIVER & HUDSON, Architects.

J. Bennet	£1,903	0	0
W. Shurmur	1,825	0	0
J. Bentley	1,781	0	0
W. Gardner	1,758	0	0

WICKFORD.

For Alterations and Additions to Schools at Wickford. Mr. F. WHITMORE, Architect, Chelmsford. Quantities by Architect.

H. R. Rons, Grays	£517	0	0
W. J. Payne, Fobbing	510	0	0
W. Letch, Braintree	510	0	0
J. Smith, Witham	485	0	0
F. Johnson, Chelmsford	461	10	0
G. Clarke, Wickford	456	14	0
W. Ansell, Billericay	455	0	0
J. Gozzett, Maldon	445	0	0
J. Elgie, Wickford	439	7	7
J. RAYNER, East Hanningfield (accepted)	395	0	0

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For New Premises at High Street, Walthamstow, for Messrs.			
Fish & Co. Mr. A. A. TWEEN, Architect.			
Woodward & Co.	.	.	£2,680 0 0
J. Jolliffe	.	.	2,515 0 0
W. Shurmur	.	.	2,466 0 0
H. Wall & Co.	.	.	2,417 0 0
J. Pocock	.	.	2,135 0 0

TRADE NOTES.

WE understand that Messrs. Wm. Potts & Sons have been entrusted with the order to make and erect the new four-dialled illuminated turret clock for the Leeds new post office. The clock is now in hand, and will be fixed as soon as the building is ready for it.

THE new Board Schools, Poppleton, York, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE are informed by Messrs. Dowson, Taylor & Co., Limited, that they have just been awarded the gold medal at the International Exhibition now being held in Vienna for their "Grinnell" sprinkler, with valves and system complete. The award is for practical efficiency and merit.

WE hear that Messrs. S. McKnight & Co., shipbuilders, Ayr, have just launched from their yard a 700-ton screw steamer, built to the order of Messrs. S. & P. Hutchison, Glasgow, for the general carrying trade between Glasgow and France, which is now almost entirely in the hands of that firm. Dimensions:—Length, b.p., 190 feet; breadth, 27 feet; depth, moulded, 14 feet. She has a long bridge poop and topgallant forecastle, and has been built under special survey to class 100 A1 at Lloyd's. The machinery, which is triple-expansion, will be supplied by the eminent firm of Muir & Houston; cylinders, 17 inches, 27½ inches, and 44 inches diameter by 33 inches stroke; boiler, 14 feet 9 inches diameter by 10 feet 3 inches long, working pressure 160 lbs. This steamer, which is being specially constructed by the Messrs. Hutchison to meet the pressing demands, is designed to attain a high rate of speed and is provided with all the latest improvements, including Baird, Thompson & Co.'s improved system of mechanical ventilation, specially adapted for the trade in

which she is to be employed. She is also provided with every facility for the efficient loading and discharging of cargo. On leaving the ways the vessel was named *Juno* by Miss Hutchison, of Lilybank Terrace, Hillhead.

THE tender of Messrs. Worth, Mackenzie & Co. has been accepted by the Hereford Town Council to put in new machinery at the waterworks. The total cost of the work is put at 3,800*l.*

THE North British Railway Company have given the contract for widening the line from the Waverley Station to Abbeyhill, and forming a new tunnel under the Calton to Messrs. Watt & Wilson, Glasgow. The cost will be between 50,000*l.* and 55,000*l.*

THE Cleethorpes Local Board have accepted the tender of Mr. Thomas Smart, of Nottingham, amounting to 4,007*l.* 7*s.*, for laying iron pipe outfall sewer and alterations to sewers in town. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham.

MR. J. W. PALMER, foreign stamp merchant, 281 Strand, London, W.C., has issued a medal; struck by him in commemoration of the opening of the Bascule Tower Bridge by the Prince of Wales on June 30, 1894. The medal is one of the Commemorative Series issued by Mr. Palmer.

THE markets committee of the Leeds Corporation have decided to remove the present Fish Market from Kirkgate to the Hay and Straw Market in York Street. Seven tenders for carrying out the work have been received, and it was decided to accept the tender of Messrs. Cross & Carter, of Bowman Lane, at about 3,000*l.*, subject to the approval of the Council. The materials of the present building will be used for inside work in the construction of the new market, but there will be an entirely new roof, the old roof having been sold.

THE Tees Conservancy Commissioners have made arrangements with Messrs. Bolckow, Vaughan & Co., Limited, the Clay Lane Iron Co., Limited, and the Cargo Fleet Iron Co., Limited, for the reclamation by these firms of nearly three hundred acres of the foreshore at Cargo Fleet and Eston. This will be effected by tipping slag, which these companies will pay for at the rate of 2*d.* per ton, this being divided into three moieties, viz. one-half to the Commissioners, one-fourth to the frontagers, and one-fourth to the Woods and Forests Department. By this means another great improvement will be effected on Tees-side, for the land which is thus reclaimed will be available for the erection of large works on the south bank of the Tees.

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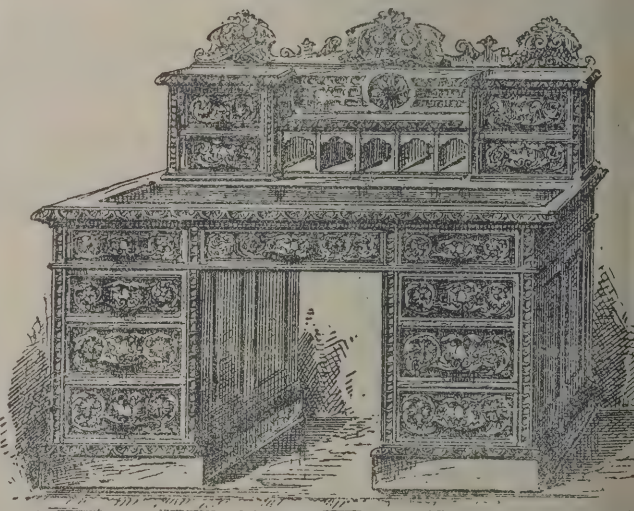
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BUILDING AND BUILDERS.

At the meeting of the Edinburgh Dean of Guild Court, seven warrants were granted. Among these was leave to Archbishop Angus Macdonald and others to make extensive alterations on St. Mary's Roman Catholic Cathedral, Broughton Street. It is proposed to remove the priests' house at the west end of the church and to place the chancel there, with vestries on the north side and a subway leading to the property No 61 York Place. Recently the administrator, the Rev. Canon Donlevy, was presented with a peal of bells which some years ago hung in St. Giles' Cathedral, and it is now intended to erect a tower for them at the north-east corner of the church, adjoining Broughton Street and Chapel Lane. There will be a baptistry at the south-west corner. It is further proposed to take down and re-erect the choir gallery in the church. The architects for the work are Buchanan & Bennett, 24 George Street.

THE commemoration stone of the New Grand Theatre for Wolverhampton has been laid in Lichfield Street. The front elevation will be of stone and brick and will be 123 feet long; the depth of the building, which will face Berry Street in the rear, will be 122 feet. The dimensions of the interior are stated as auditorium, 70 feet wide; pit, from curtain line to back wall, 58 feet; depth of stage from curtain line, 41 feet 6 inches; and width of ditto, 65 feet 6 inches; proscenium opening, 35 feet; height from pit floor to centre of ceiling of auditorium, 39 feet; height from stage floor to gridiron, 55 feet. The structure is being erected by Mr. H. Gough, Wolverhampton, from designs by Messrs. C. T. Phipps & Son, architects, London.

The reconstruction of St. Werburgh's Church, Derby, has just been completed from the designs of Sir Arthur Blomfield at a cost of nearly 14,000l.

AT Grimsby a site of 11,000 square yards has been offered on a 99 years' lease for the erection of a public free library

and a technical school, and it is stated that with the sanction of the Local Government Board the lease will be accepted.

AT the meeting of the Liverpool School Board it was resolved to purchase from the Earl of Derby, at a price of 20l. per square yard, a piece of land in Sir Thomas Street (containing 361 square yards, for the purpose of building suitable offices for the board.

IT is proposed to erect a new grammar school in the High Street, Dudley, owing to the unsuitability of the present school building in King Street, and the defects of its structural arrangements, as well as to the lack of sanitary appliances.

THE Birmingham City Council passed a resolution authorising the public works committee to borrow 5,200l. for the erection of stabling and other buildings at the Corporation Wharf at Harborne. Mr. Bayley asked whether the plans were prepared in the office, or had the services of an architect been engaged. Alderman Cook remarked that there was a strong and growing feeling in the direction of engaging professional architects for buildings of any importance. Mr. Smith said that the plans had been prepared at the Council House, but in future the committee would engage skilled architects for preparing plans of any importance.

OWING to the death of the managing partner, Mr. David Kinnear, Messrs. Kinnear, Moodie & Co., the contractors for the Leith new dock works, ceased operations, after the work had been in progress for some months, and the contract was eventually secured by Mr. John Best, Edinburgh. Since that time Sir Alexander Rendall, advising engineer to the Dock Commission and arbiter between the parties, has had under consideration the amount of work done, and has now issued his award which, it is understood, is that the trustees of Messrs. Kinnear, Moodie & Co. should receive the sum of 8,000l. from the Commissioners for the harbour and docks for the work done and the plant laid down on the ground. Messrs. Kinnear, Moodie & Co. lose several thousand pounds; but according to the conditions stipulated in the contract, the Dock Commission claimed the right to take over without payment the completed work and plant in the event of the contract being broken.

AT the meeting of the Ripon City Council it was proposed that a sum of 14,000l. should be borrowed to carry out the sewage purification works and intercepting sewers, and 300l. for Princess Road sewer, and that the proposed renewal of street sewers should be deferred, but an amendment was carried,

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"That 19,000*l.* be borrowed, to include, in addition to the above, renewal of sewers in various parts of the city.

At the monthly meeting of the Hereford Town Council payment was ordered to be made to the Ecclesiastical Commissioners of 2,000*l.* for the purchase of the land at Bartonsham for the extension of the sewage outfall works.

THE death is announced of Mr. John Whittaker, a well-known St. Helens builder and contractor. Mr. Whittaker was seventy years of age, and although brought up in Manchester had spent the last forty years in St. Helens. Mr. Whittaker among other buildings in the town had erected the Corporation baths at Boundary Road and the new softening works at Nutgrove.

At the meeting of the Keighley Board of Guardians two schemes for enlarging and improving the washhouse and laundry accommodation were submitted by the architect, Mr. Moore, at a cost of 530*l.* and 150*l.* respectively. The opinion was expressed by several members that, taken together with the enlargements at the infirmary, the carrying out of this extension would render unnecessary for fifteen or twenty years the suggested rebuilding of the workhouse, which latter would probably mean an outlay of 16,000*l.*

VARIETIES.

AMONG private Bills, Lord Portman's committee has just passed the County Council General Powers Bill, which authorises them to contribute 6,000*l.* for the extension of Paddington Recreation Ground, and also gives further powers in preventing the introduction of hot water and refuse into the sewers. In relation to the latter subject the committee decided that the Marylebone Vestry were still to be allowed to get rid of their snow by means of the sewers so long as it was free from road detritus, and also prohibited the brewers from putting in hot water above 110 degrees Fahrenheit, but postponed the operation of this clause for a year to enable the trade to make other arrangements than those now in operation.

The annual beanfeast of the employes of Messrs. Braby & Co., engineers, of the Fitzroy Works, Euston Road, London, took place on Saturday at Bognor. The party, which numbered between sixty and seventy, arrived about 11.30 A.M. A cricket match, Married *v.* Single, was engaged in on the sands; and at two o'clock the company sat down in the small hall of

the Assembly Rooms to dinner, Mr. N. Sherson presiding. During the afternoon drives were arranged to Chichester, Goodwood and the now celebrated Jubilee Stamp Room at North Bersted. The party returned to town at 7.50 P.M.

IT is intended to erect villas of from 40*l.* to 60*l.* a year on sites adjoining the barracks at Chichester.

THE Liverpool city engineer has been instructed to make arrangements for the lighting of Lime Street throughout with incandescent gas burners, the present lighting power being maintained.

AT Alexandria a new channel to the harbour, 28 feet in depth, has just been officially opened. Vessels will now be able to enter the port of Alexandria by night as well as by day.

THE almost immediate publication of the "Photography Annual for 1894," edited as usual by Mr. Henry Sturmy, is announced by Messrs. Iliffe & Son.

THE Glasgow Corporation has taken over the direct control of the city tramways. The project has so far involved an outlay of nearly 300,000*l.* for building purposes, new plant, &c., and further expenditure is yet to be anticipated ere satisfactory working can be attained. The new cars are an immense improvement on the old, being pronounced by experts to be models of perfection of their kind.

At the monthly meeting of the Clyde Navigation Trust it was agreed to proceed with the hydraulic installation building at Cessnock Dock, at a probable cost of 11,600*l.*, and alterations in the hydraulic installation at Queen's Dock at an estimated cost of 4,100*l.*

THE Guiseley Local Board intend to apply to the Local Government Board for sanction to borrow 10,000*l.* for the purpose of purchasing the works and plant of the Guiseley Waterworks Company. The amount includes 1,500*l.* for a new reservoir and nearly 500*l.* for the renewal of pipes.

At the meeting of the Birmingham School Board, the sites and buildings committee will recommend that about 2,000 square yards of additional land be purchased to enlarge the site of the school in Chandos Road, Moseley Road, and that the schools in Dixon Road and Montgomery Street be enlarged by the addition of class-rooms.

At the meeting of the Lynn Town Council the special committee on municipal buildings brought up a report recommending the erection of a suite of new rooms at the cost of 4,000*l.* The report was adopted.

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THE death is announced of Mr. D. Clack, building surveyor, of Lynn. Mr. Clack came to Lynn as clerk, &c., to Mr. Charles Bennett, builder, then in a large way of business, and subsequently entered into partnership with Mr. R. Dye, upon Mr. Bennett's retirement from Lynn, and the firm executed a number of public works. After the dissolution of this partnership, Mr. Clack practised as surveyor, and entered the Town Council for the South Ward, being at that time a popular man, through the independent line he took in relation to the management of the docks and other local matters.

At the meeting of the Cheltenham Town Council Mr. H. Kilgour was appointed electrician to the Town Council at a salary of 200*l.*, rising to 250*l.* Messrs. Malvern's tender at 1,799*l.* was accepted for the erection of the central electric-lighting station. The tender of Callender's Bitumen Telegraph and Waterproof Company at 1,031*l.* 8*s.* 4*d.* was accepted for the supply of cables, subject to those for the high-pressure ones being guaranteed for ten years.

THE LONDON AND NORTH-WESTERN RAILWAY COMPANY.

GREAT improvements have just been made at the Willesden Junction and Euston stations for the London and North-Western Railway Company, largely facilitating passenger and vehicular traffic. At the former station alterations and additions comprise new railway bridge for Broad Street trains, together with platforms, waiting and refreshment rooms, booking-halls, &c.; approach incline from Harlesden Road to low level platform; iron footbridge for passenger traffic and additional bay to Harrow Road bridge; about 1,000 tons of iron and steel have been used in these works. At Euston a steel bridge 150 feet by 26 feet has been erected, together with approach roadway on massive brick viaducts, for the purpose of taking the milk and parcels traffic; this work necessitated the raising of the roof bodily the whole length of the bridge, and also some very heavy shoring under the existing buildings while inserting girders, which could only be carried out under difficulty owing to the immense weight to be supported. New offices, platforms and the general reconstruction of a large portion of the station has been effected. The whole of this work has been carried out without hitch or inconvenience to the traffic, at a cost of about 60,000*l.*, by the

contractors, Messrs. Kirk & Randall, of Woolwich, who have completed the works at Euston in the extraordinarily short space of twenty weeks.

A UNIQUE SALE.

TO-MORROW (Saturday) a private view will be held of objects to be sold by auction by Messrs. Hampton & Sons, of 1 Cockspur Street, S.W. The objects to be sold consist of the valuable and unique contents of No. 28 Ashley Place, Victoria Street, S.W., the property of Mrs. Wallace Carpenter, embracing rare specimens of Moorish, Cairene, Indian, Persian, Oriental and other furniture; carved and beautifully-decorated woodwork, representing Eastern corridors, arches, &c.; curios, draperies, old embroideries, carpets and rugs, being a collection extending over a period of thirty years and gathered together as the fruits of several voyages to Eastern countries, including a magnificent orchestration and a fine-toned harmonium, piano, &c. The auction sale will be held on Tuesday, July 10, and following days at one o'clock, by Messrs. Hampton & Sons. The objects to be sold are comprised under 775 lots. No pains have been spared in preparing the catalogue, which gives a clear and concise description of all objects to be submitted for purchase.

METROPOLITAN WATER SUPPLY.

THE water committee of the London County Council, of which Mr. Bassett Hopkins is chairman, brought up a report to the last meeting of the Council asking for powers to make the necessary preparations for the introduction of one or more bills in the next session of Parliament for the transfer to the Council of the undertakings of the metropolitan water companies, or of such one or more of them as the Council might hereafter determine. Since then the committee have had an opportunity of further considering the matter, and they have come to the conclusion that it would be better to go to Parliament for powers to acquire the properties of all the companies, but to proceed by means of a separate bill for each company; they therefore recommend that eight separate bills be prepared, and the appointment of three members of the water committee to act in conjunction with the Parliamentary Committee in the preparation of the bills, with a view to their introduction in the next session of Parliament.

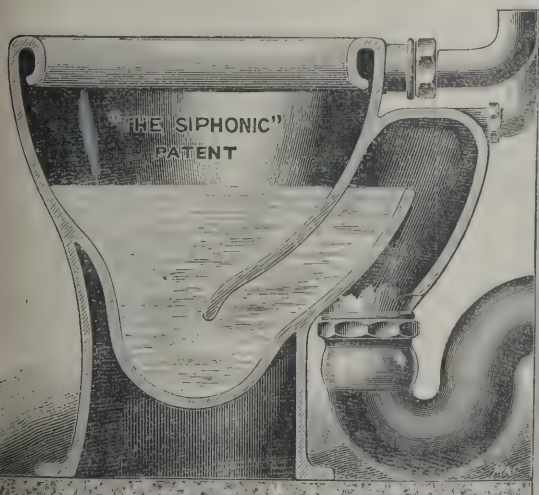
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MUNICIPAL WORKS IN BIRMINGHAM.

THE report of the public works committee of the Birmingham Corporation announces that the sanction of the Local Government Board to the loan for the completion of the Hockley Brook improvement having been given, tenders for the work were obtained by a joint committee of the Aston Local Board and the public works committee, and that of Messrs. Jones & Fitzmaurice, of Birmingham, at the sum of 8,492*l.* 14*s.* 2*d.*, was accepted, and the work is proceeding. The cost will be borne jointly by the two authorities. The committee have accepted the tender of Mr. R. Fenwick, of Birmingham, for the erection of the additional stabling and granary at Holliday Street Wharf authorised by the Council, for the sum of 6,095*l.*, and the work is now being proceeded with. By a minute of the Council the committee were authorised to acquire on a ninety-nine years' lease a piece of land adjacent to the Harborne Railway, as a dépôt for stabling and shedding, storage of materials, &c. The London and North-Western Railway Company have constructed a siding from the Harborne line into the wharf, and the committee, after conferring with the health committee, who will require some of the stabling, recommend that they should be authorised to erect stabling for ten horses, two loose boxes, harness-room, mess-room for men, engine-house and pit for housing and repairing steam road-rollers, &c., with a loft over the stabling, a house for the foreman, and an office. The estimated cost of these works, inclusive of boundary walls, railway siding, construction of roads, paving of yard, weighing-machine, &c., is 5,200*l.*, and the committee recommend that they be authorised to have the buildings erected. With reference to the Council minute referring to the committee a memorial from residents in the vicinity of the tramway terminus in the Old Square, praying that the nuisance occasioned by the execution of repairs to the tram rails by night might be abated, the committee report that these repairs can only be executed at night, except by suspending the traffic; they have, however, with a view to diminishing the inconvenience complained of, given instructions that, as far as is consistent with the proper execution of repairs, the rails shall be cut and prepared before being brought on the spot. The committee having received an application from the Birmingham Central Tramways Company for permission to construct the Bristol Road tramways on the overhead electric-wire system as at Walsall, they visited Walsall, accompanied by representatives

of the company, and inspected the system in operation there. They were of opinion, however, that the system was not one which they could recommend the Council to sanction for adoption on the route named. The lighting of the courts in the city continues to receive attention. During the present year the necessary steps have been taken to provide the proper means of lighting in 500 courts, and instructions have been given to prepare the necessary plans and specifications in respect of 250 more.

THE FORTH BRIDGE.

At this season of the year the painting of the bridge may be seen, the *Glasgow Herald* says, in full operation. During the winter and spring months the weather will not permit of such work being carried on, and it is therefore only during the summer and autumn that it can be accomplished with anything like safety and success. The whole of the structure receives a new coat of paint every three years, and this is carried out in sections, about one-third being undertaken each year. Last summer the northern approach viaduct and the north cantilever were successfully dealt with, and this year the southern approach viaduct and the south cantilever are being treated in a like manner. It is also intended to include the two centre girders in this season's work, which will then leave only Inchgarvie cantilever for next year. Besides the painting, every part of the structure is carefully examined, and loose or defective rivets removed and new ones put in their place. Some idea may be had of the immense quantity of material used in the construction of this bridge when it is mentioned that it requires about 50 tons of paint to cover it, and that the area thus dealt with is something like 120 acres. At the present time about fifty men are employed, and an endeavour is made to retain, as far as possible, the same men upon the work, as it always takes new hands some time to become thoroughly acquainted with their aerial position. At first this work was attended with considerable danger, but very complete apparatus in the shape of small cages has now been provided, so that the men run very little risk even at the highest and most dangerous points. In fact, the present arrangements work so well that for a long time past no accident has been heard of. Notwithstanding that since the bridge was opened about 200 trains have passed over it daily, the tear and wear is as yet almost inappreciable, and the inclinations and deflections quite unchanged.

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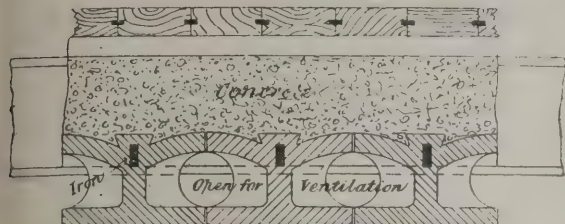
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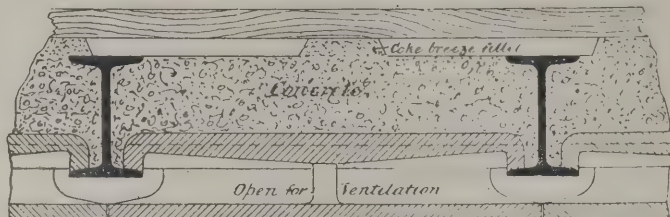
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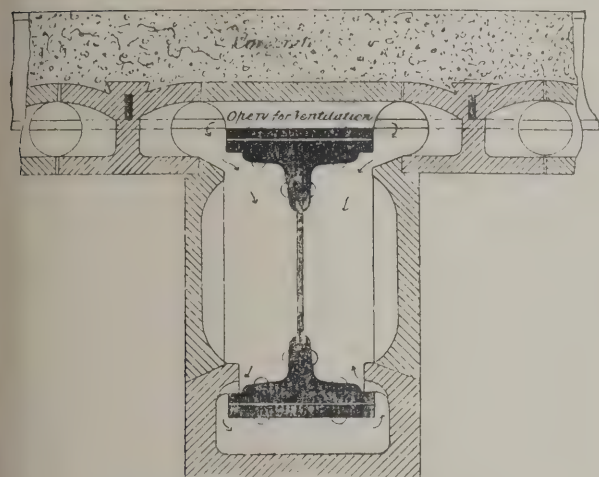
Less iron is also necessary, and a thoroughly-ventilated air-space is provided between the ceiling and the ironwork. The conductivity of gypsum is less than one-half of fireclay. They also provide for thoroughly protecting the constructional girders, which is of the utmost importance when a fireproof floor is required. Special slabs for walls on the splay can be quickly manufactured, and if necessary the whole of the slabs may be made on the job and at once fixed. A very light and thin fireproof floor can be constructed in this manner. They also show in their new catalogue fireproof slabs for stanchions,



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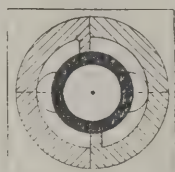


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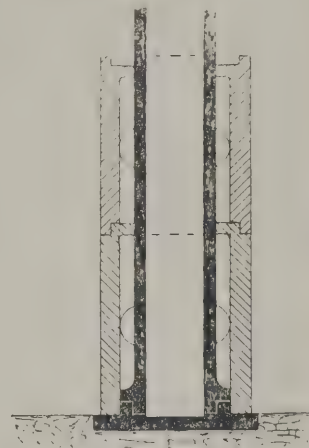


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THE TOWER BRIDGE.

THE Tower Bridge is, and ought to be, a great work, for it will have cost, before all is finished, about 1,170,000*l.*, and to keep it in good condition and working order, with a proper staff of police and attendants, somewhere between 6,000*l.* and 8,000*l.* a year will be required. Brand new as the bridge stands to-day, it has in a sense sprung out of a very remote past, for the money that has built it has been yielded by the Bridge House Estates, with which Old London Bridge was originally endowed somewhere about the time of Thomas à Becket, with whose memory the first bridge was associated. The original idea of it was struck out by the late Sir Horace Jones—when he was Mr. Horace Jones—the City architect, who seems to have taken a hint from the bascule bridges of the old feudal fortresses, and to have aimed at harmonising his new structure with the hoary old Tower of London close by. Although it is new, it thus seems to be closely linked with the past, and it stands with its roots thrust deep down 15 feet into the hard, solid rock-like London clay. They reach down 27 feet under the bed of the river and 60 feet down below Trinity high-water mark. They were formed by slowly sinking down enormous steel caissons—huge cylinders weighing altogether a thousand tons, dropped down end foremost. The water was pumped out of them and the river bed dug away from beneath them until their own weight carried them down to the necessary depth in the London clay, and then they were filled in with concrete and built round with brick and granite; and so the foundations were laid big enough for the piers, each 205 feet long and 100 feet in width, and solid enough to bear the full weight of the vast superstructure, somewhere about 70,000 tons.

The two piers are 200 feet apart, and upon each of them were built up four columns of steel, $5\frac{1}{2}$ feet in diameter and 120 feet high. These four columns on each pier, connected by

massive girders, constituted a steel tower of tremendous strength, but also of great ugliness, and two of them have been masked by handsome Gothic buildings of granite. The beautiful stone towers, however, are only for show. It is beauty only skin deep, and it is the ugly steel towers within them that constitute the main supports of the suspension bridges on either side the river and the two high-level girder-bridge footways across the middle. It is these steel towers that sustain the tremendous weight of the "chains" and the bridges at the top, the ornamental stonework standing around them quite unconnected. The "chains" are anchored deep in the bank on either side the river, pass over the handsome abutment towers forming the entrance to the bridge, sweep in a vast curve down nearly to the road level, and then upwards to the summit of the central towers, where they are connected with the ends of the high-level girders spanning the central 200 feet. Thus the suspension bridges pull one against the other across the central gap, keeping the lofty footways fixed and rigid. These side suspension bridges are, of course, fixed. They are at just about the same level as London Bridge, and they give just about the same headway at high-water as is given by the central arch of that structure—29 feet 6 inches, that is to say. They each have a span of 270 feet.

In all this there is nothing new or very remarkable in any way, except the great scale of the work. It is really an enormous structure—much larger than it looks indeed. From the bottom of the foundations to the top of the gilded grills, the central towers are 293 feet high, or about the height of the golden gallery of St. Paul's above the pavement below. The elevated footways are over 140 feet above high-water mark. The bridge and its abutments are 940 feet long, and with the approaches, which add 1,700 feet, the entire length of the work is just about half a mile. Nearly 16,000 tons of iron and steel have been employed in it, and 20,000 tons of cement. There are 31,000,000 of bricks embedded in it, and 415,000 cubic feet of stone of one sort and another. Londoners have certainly got a considerable amount of material for their money, and a vast amount of good sound honest workmanship, to say nothing of the very best engineering skill of the day, steadily labouring away for eight long years.

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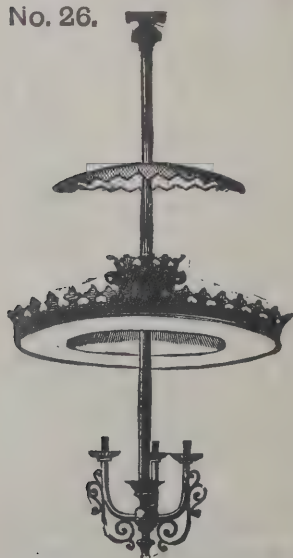


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R. H., London, September, 1893

The Gas Light also at this Hall is said to be over twice what it was before.

J. C. HALLIDAY,
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hydraulic power that even Sir William Armstrong and his company have ever yet afforded. Many thousands of Londoners have already become familiar with them, though comparatively few have seen them in action. In their horizontal position they present a broad expanse of wood-block roadway 200 feet long and 50 feet broad, and weighing 2,400 tons. Beneath them there is a clear headway of nearly 30 feet, so that all the smaller craft of the river can readily pass under them even at high water, and will have a waterway of 200 feet. While they are down the new bridge will present a fine level roadway from end to end, and abundant space for pedestrians and vehicles. Larger vessels requiring to pass up or down the river, however, will of course require more headway, and on the approach of one of them the low-level way will be barred by a chain drawn across the bridge. Vehicles will have to pull up for awhile, and the stream of pedestrians will be turned into the great towers to reach the high-level footways either by the winding staircases of 170 or 180 steps, or by the hydraulic lifts, of which there are two in each tower—small rooms 14 feet by 5½ feet, and 9 feet from floor to ceiling—capable of taking five-and-twenty or thirty people up and down five-and-twenty times an hour. While the foot passengers are thus being hoisted aloft the machinery of the bridge will itself tighten the chain, thus affording a rigid, impassable barrier. Until this has been done that same machinery will render it impossible to raise the bascules. The instant the chain is in position and drawn tight across the road, however, the man in the little glass cabin on the southern pier at its eastern end will find a lever yield to his pull, though previously immovable. The lever comes over, and the great bascules—each of them presenting a surface of 5,000 square feet of seemingly solid roadway and footpaths—will rise into the air and fall back perpendicularly against the towers. The big ship with her masts, it may be at their full height, will pass through. Another lever will be drawn, and the bascules will fall swiftly and silently, rise and fall having occupied just about one minute, though it is estimated that the control of the traffic and the working of the bridge will average about five minutes. When, however, the tide is within a couple of hours or so of high water, and vessels come thick and fast, it is expected that the bascules may be kept open for a quarter of an hour or twenty minutes at a time. The machinery by which these ponderous trapdoors are raised and lowered and the lifts run up and down in the central towers is hydraulic.

Over on the Surrey side there is a structure of yellow brick

—bald and ugly and obtrusive—a striking detraction from the beauty of the fine Gothic structure to which it is subsidiary. This is the original source of power. The approach to the bridge is built on a series of arches, and under two of these arches are four steam boilers 30 feet long. Another of the arches is a coal store, and two others contain the splendid pumping engines by which water is forced into the hydraulic accumulators under a pressure of 700 lbs. to the square inch. From these accumulators two 6-inch steel mains run along to the hydraulic machinery concealed in the heart of the granite piers in the middle of the river. Solid as they look, both these piers are, internally, wonderfully intricate mazes of mechanism, half of which, however, as it has been explained, is only a reserve in case of emergency. Down below the machinery are the accumulator chambers, while above are the little glass cabins from one of which the whole vast mechanism will be worked, the other three existing merely for the sake of uniformity of appearance. This cabin overlooks the bascules, and is in telephonic communication with every other part of the works. It has something of the appearance of a railway signal-box, with its gauges, its telephone box and its double row of levers. Great as is the power it commands here, the actual exertion of it on the ponderous bascules is but small, for though each weighs complete something like 1,200 tons, each is swung on a steel pivot 2½ feet in diameter, and counterpoised by 300 tons of lead and 130 tons of iron. They thus are so nicely adjusted that a very small portion of the hydraulic force it commands hoists the huge bascules into the air or brings them down again to the level. The application of the power simply means letting a little cold water into the tangle of machinery down at the feet of the towers. This sets in motion a couple of cog-wheels, which work in a rocked quadrant at the back of the bascule. As these small cog-wheels run round the quadrant in one direction, the bascule falls; as they are reversed and run back again it rises. The principle of the thing is simple enough, but the mechanism by which it is all carried out looks to be wonderfully complicated and intricate. There are two pumping engines, each of 360 horse-power, eight large hydraulic engines and six accumulators.

This great and important work urgently demanded for so many long years was finally decided on in October 1884, and excavations were actually commenced in May 1886, and the memorial-stone was laid by the Prince of Wales on June 21 following. It has thus been in hand just about eight years. This is far in excess of what was originally considered would

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When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4½ brickwork partition walls. The thickness from face to face is only 3 inches, thus saving enormously in weight and space.

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

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be necessary, and the cost of it has also been much heavier. I cannot be said, however, that time and money have not been well expended. The convenience of it will no doubt be immense, and as a public work it is well worthy of its prominent position as the one entrance to London from the sea. The late Sir Horace Jones—who by the way nearly met his death at the ceremonial stone-laying by the falling of a part of one of the machines in use—designed the bridge in co-operation with Mr. Wolfe Barry, C.B., as engineer. Upon the death of Sir Horace Jones the mantle of the architect fell upon the shoulders of Mr. G. D. Stevenson, formerly his assistant, Mr. Barry still being engineer, with Mr. G. W. Crutwell resident engineer. Various portions of the work have been entrusted to several contractors. Mr. John Jackson did the foundations and the northern approach. The southern approach was entrusted to Mr. W. Webster. The iron and steel have been supplied by Sir William Arrol & Co., the masonry of the towers has been the work of Messrs. Perry & Co., and the hydraulic machinery has been supplied by Sir William Armstrong & Co.

There are still other firms who have the privilege of their names being associated with this grand work.

On the four sides of the two abutment towers are to be seen perhaps the largest productions of the City arms ever executed in stone, but there is one still larger in the centre of the upper span or bridge, produced in iron and decorated, the model for which, together with the whole of the carving, was executed by Mr. C. H. Mabey, sculptor, Westminster; also the royal arms upon the foundation-stone.

The bridge and its approaches are lighted entirely by gas, with brilliant effect, upwards of 200 of Sugg's high-power gas-lamps being used for this purpose. The various arrangements made for the illumination by night of this huge water-gate of London constitute a most important installation of public lighting. On the north approach (City side) there are about forty large hexagonal gas-lamps, all fixed upon handsome cast-iron standards mounted on the parapets. The shore spans and south approach are lighted by similar lamps elevated upon ornamental cast-iron columns erected at the edge of the kerb. The lighting of the opening span is provided for by means of four lamps of special construction, each having an effective illuminating power of 400 candles. These are suspended from massive iron brackets of handsome design fixed on the navigation sides of the north and south towers. It is worthy of mention that all the columns and brackets for the lamps have

been cast to the special designs of Mr. G. D. Stevenson, A.R.I.B.A. The result is that the lighting arrangements serve an additional purpose which is too often lost sight of, by helping to beautify the structure upon which they are placed. The engine and boiler-rooms, the machinery chambers on the piers, the bascules, accumulator-chambers, staircases, lifts and high level footways are all lighted in a very effective manner, and in many cases the lamps have been specially constructed to suit the positions they now occupy. On both sides of the bridge large gas meters are fixed, and the mains are so arranged that in the event of its being necessary at any time to stop the supply on either side, the gas for that side of the bridge may be obtained from the other. Some eighteen months ago, just after the gas work was commenced, temporary supplies were laid on over the bridge, towers, &c., and lights fixed to facilitate the work of building and to prevent accidents as far as possible. It is not uninteresting to know that these temporary supplies have been gradually removed as the permanent mains were run, without once stopping the supply of gas to any part where light was required.

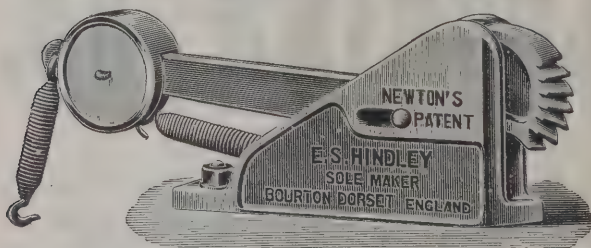
The whole of the gas work has been carried out by William Sugg & Co., of Westminster, who have also supplied the water mains and supplies throughout, and the hydrants, tanks and hand-pumps in connection therewith. We may mention that the work has been personally superintended by Mr. William Sugg, assisted by Mr. John Worsfold, upon whom the task of carrying out the work has largely devolved.

The whole of the staircases in the towers have been fitted with Mason's patent unwearable non-slipping treads supplied by the Safety Tread Syndicate. The wood blocks have been executed by the Acme Wood-block Flooring Company, Limited, on Duffy's system. The patent stone of the Victoria Stone Company has also been largely used.

There are still a good many odds and ends of work remaining to be done, and the full Parliamentary time allowed for its completion, extending up to August, will probably elapse before all can be finished. But for all practical purposes the work is complete. The ceremony on the opening day was a great success, and the glorious weather, it must be admitted, added the crowning adornment to a brilliant pageant. It is understood that the bridge will be open to the public on Monday.

THE Birmingham Corporation intend to appoint a principal for the technical school at a salary of 500*l.* a year.

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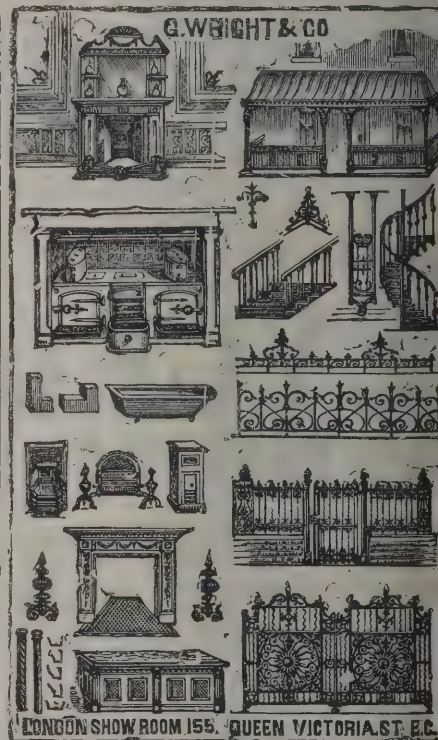
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MINERAL ROCK ASPHALT.

A VISIT has just been paid to the works of the Limmer Asphalte Paving Company, Limited, Leamouth Wharf, Blackwall, by members of the Incorporated Association of Municipal and County Engineers, when Mr. Blake read the following short paper:—The uninformed mind regards all tar paving, British asphalt and similar compositions as asphalt, and believes them to be practically the same thing as rock asphalt. This is a great mistake, and the result is frequently that because these materials are laid for asphalt and fail in the winter to stand the cold and in the summer to stand the heat, 'rock asphalt' is condemned. Rock asphalt, however, is a totally different material, it has nothing whatever to do with gas tar and similar materials, and will not amalgamate with them. Rock asphalt is a natural product—a limestone rock impregnated with bitumen—and is found in Limmer and Vorwohle in Germany, in Switzerland, France and Sicily. For compressed work this company's supplies are taken from Ragusa in Sicily, and for mastic work from Germany. It is quarried in the same manner as other minerals, and brought to England in its natural state as you see all round you. The process of manufacture of compressed asphalt for carriageways, &c., is as follows:—The pieces of raw rock weighing from $\frac{1}{4}$ to $\frac{1}{2}$ cwt. are placed into the "crusher," where they get broken to the size of walnuts. After passing through the crusher the asphalt is carried up by elevators to the disintegrator, which runs at a speed of 1,800 revolutions to the minute, where it is ground to a fine powder. For compressed work this powder is heated in roasters with revolving cylinders to a temperature of about 280 deg. Fahr., and as soon as the superfluous moisture has evaporated the heated powder is placed in iron sheathed vans, covered with cloths and taken to the street where it is to be laid. The powder is then raked over the surface of the street to the thickness required and rammed with hot pelons, smoothed to a polished surface and then rolled with a heavy hand roller. It gradually becomes cold, and in time is compressed into solid rock again by the traffic. The usual thicknesses of compressed asphalt are as follows:—

Carriageways (heavy traffic)	2 inches
" (light ")	1½ "
Laid on a bed of 6 inches of Portland cement concrete.	
Footways	1 inch.
On a bed of 3 inches to 4 inches of Portland cement concrete.	

Compressed asphalt is the most suitable material for carriageway pavements for the following reasons:—Its durability, the rapidity with which it can be repaired, causing no delay to traffic or inconvenience to the public, its great sanitary properties, because being jointless it is readily and easily cleansed, and no vegetable or animal refuse can lodge in crevices and decay. Asphalt, when clean, is not slippery. The only time that horses slip is when a shower of rain is just commencing, then the dirt which has been allowed to remain on the asphalt becomes a little damp and makes a greasy surface for a few minutes until the pavement is thoroughly wet. In Paris the streets are regularly flushed, but there the engineers can get free water direct from the Seine. In London filtered water has to be purchased at present from the water companies.

The uses of mastic asphalt are limitless ; among others the following may be enumerated : footpaths, courtyards, stables, coachhouses, roofs, floors, vertical work to walls, corridors, basements, wine cellars, tennis courts, reservoirs, slaughter-houses, &c. It is manufactured in the same way as the compressed as far as the powder stage, then it is boiled in cauldrons worked by agitators, with a certain quantity of bitumen as flux, and when heated to about 400 deg. Fahr. a proportion of from 10 to 20 per cent. of fine Bridport grit is added and thoroughly incorporated with the asphalt by the agitators ; it is then turned into iron moulds and made into cakes of half a hundredweight each, ready to be sent to any part of the world. These cakes are broken up, put into cauldrons with just sufficient bitumen as a flux, and, when properly cooked, the asphalt is spread over the surface to be covered by means of the hand-floats and then rubbed with fine sand. The bitumen used in the manufacture of mastic asphalt is a most important feature, and its manufacture requires the greatest possible care. The cheaper kinds are made from petroleum refuse, gas tar, &c., but these materials have a deleterious effect on asphalt. The very best bitumen is made from best Scotch shale and refined Trinidad pitch (*épurée*). It is very expensive, but it is of the greatest importance to have it of the best and purest possible quality. By manufacturing this ourselves we can always guarantee our asphalt to stand the extremes of heat and cold. The sanitary advantages of asphalt over every other pavement cannot be overrated. In crowded neighbourhoods, back courts and alleys, where the poorer classes dwell, it is of the greatest importance. The asphalt can be flushed with water at any time, and all impurities, refuse, &c., washed away,

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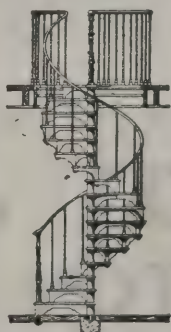


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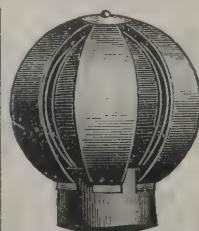
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5 " 0 " "
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6 " 0 " "

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2 " 4 " "
2 " 8 " "
3 " 0 " "
3 " 4 " "

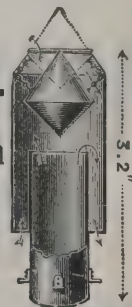
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and the pavement is immediately dry again. The London County Council have ordered all slaughter-houses to be paved in this way, as they can then be flushed and made perfectly clean and sweet at once. For footways it is the very best material. While tar paving and all similar compositions require to be constantly renewed, rock asphalt laid 1 inch thick will last from twenty to twenty-five years and longer, according to the nature of the traffic. In the City of London and for the various vestries and district boards of works of the Metropolis this company has laid many hundred thousands of yards of carriageways and footways, which have given entire satisfaction.

After the reading of the paper, questions were addressed on the subject of Trinidad pitch pavement. Mr. Blake explained that many experimental pieces of pavement made with Trinidad pitch and other materials had been laid in the City of London during the last twenty-five years, but they had not proved satisfactory, and had all been replaced by rock asphalt.

After a vote of thanks to Mr. Blake for his paper had been unanimously passed the company inspected the works, with which they expressed their great satisfaction.

A cordial vote of thanks to the directors, which was acknowledged by Mr. Greig, the chairman of the Board, concluded the proceedings.

KESWICK MORTUARY CHAPEL, NORFOLK.

THE old church of All Saints, in this parish, which has been in ruins for upwards of 250 years, Divine service having been last held there in 1602, and its remains principally consisting of part of the round tower, almost surrounded by trees, is now undergoing a partial renovation for the purpose of being used as a mortuary chapel, at the sole cost of Mr. John Henry Gurney, J.P., of Keswick Hall. The restoration will proceed as nearly as possible on the old lines, the principal works undertaken being thorough repair to the tower, including new roof, windows, &c., building new walls to the nave on the old foundations (which, even after a lapse of several centuries, appear on examination to be sound), and covering the nave roof with tiles, &c. The iron railing enclosing the churchyard, which has now been reopened for interments, was erected last year, also at Mr. Gurney's expense. The work to the new mortuary chapel has been entrusted to Mr. J. S. Smith, of 24

City Road, Lakenham, Norwich, under the superintendence of Mr. Herbert J. Green, of 31 Castle Meadow, Norwich, architect and diocesan surveyor.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

11756. Samuel Tomlinson, for "Improved fastener and adjuster for windows and doors."

11770. George Thomas Richardson, for "Improvements in the means of rendering doors, windows, casements and the like dust, draught and waterproof."

11771. John Julia Ridway, for "Improvements in locks and latches."

11786. Samuel Taylor, for "Improvements in casement windows."

11803. Ralph Sibley, for "Improvements in frames of drain traps and the like."

11820. Joseph Thomas Nicholls and Thomas Crooke, for "Improved window-sash holder."

11980. John Lakin and Charles Johnson, for "An improved method for raising and lowering windows in sashes and as a dust and draught excluder, to be used on board ships or in any kind of carriage or elsewhere."

12094. William Barber Press, for "Improvements in stop-cocks and taps."

12098. Eustace Fraser Rawlins, for "An automatic sash-fastener."

12153. George Wheeldon, for "Improved means of securing window sashes."

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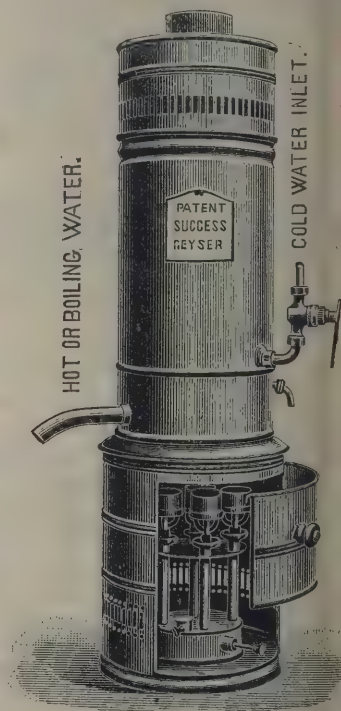
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SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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* *As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

CONTRACTS OPEN.

ASHFORD.—July 27.—For External Iron Staircases. Mr. C. D. Hume, Clerk to the Managers of the West London School District, Ashford, near Staines.

ASHTON-UNDER-LYNE.—For Warehouse and Stabling. Messrs. T. George & Son, Architects, Old Square, Ashton-under-Lyne.

AYLESBURY.—July 28.—For Building Public Baths. Mr. George Fell, Clerk, 2 Rickford's Hill, Aylesbury.

BANGOR.—July 14.—For Building Lecture Hall to Church. Mr. Wm. Hanna, Main Street, Belfast.

BECKENHAM.—July 16.—For the Making-up of Marlow Road. Mr. J. A. Angell, C.E., Local Board Offices, Beckenham.

BEDMINSTER.—July 30.—For Building Board School. Mr. Edward Gabriel, Lucas Hall Chambers, Baldwin Street, Bristol.

BLAYDON.—July 14.—For Additions to Police Station. Mr. Wm. Crozier, County Architect, Durham.

BRADFORD.—July 16.—For Enlargement of Infant School. Mr. E. P. Peterson, Architect, 10 Exchange, Bradford.

BURNLEY.—For Building School Chapel. Mr. A. Robinson, Architect, Burnley.

BURNLEY.—For Additions to Houses. Mr. Thos. Bell, Architect, Burnley.

BURSCOUGH.—For Police Station. Messrs. F. & G. Holme, Architects, 1 Crosshall Street, Liverpool.

CARDIFF.—July 14.—For Extension of Board School, Grange-town. Mr. E. M. B. Vaughan, Architect, Borough Chambers, Wharton Street, Cardiff.

CHRISTCHURCH.—Aug. 11.—For Building Cottage Homes and Schools. Mr. A. Druitt, Clerk to the Board of Guardians. Mr. E. H. Burton, Architect, Bournemouth.

COVENTRY.—July 17.—For Mortuary for Workhouse. Messrs. F. & G. Sleane, Architects, Coventry.

CUBERT.—July 14.—For Building Board School. Mr. R. H. George, Clerk to the Board, Trevel, Cubert, Cornwall.

DORCHESTER.—July 19.—For Additions to Schools. Mr. J. Feacey, South Walks, Dorchester.

DRIGG.—July 27.—For Improvements to Farmhouse and Buildings. Mr. William Hodgkin, Drigg, Cumberland.

ELY, CARDIFF.—July 17.—For Construction of Passenger Station. The Secretary, Paddington Station, W.

GRAVESEND.—July 17.—For Alterations to Board Schools. Messrs. Cobham, Architects, Edwin Street, Gravesend.

GRANGE-IN-BORROWDALE.—July 21.—For Building School. Rev. A. J. Heelis, Borrowdale Vicarage.

GWAELODYGARTH.—July 16.—For Building Thirty-one Houses. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

HARROGATE.—July 14.—For Building Board School. Mr. E. Marshall, Architect, Prince's Street, Harrogate.

HECKMONDWIKE.—July 18.—For Building Eighty Houses. Mr. T. Houghton, Secretary, Euston Station, N.W.

HETHERSGILL.—July 20.—For Additions to School. Mr. Leslie, 11 Broad Street, Carlisle.

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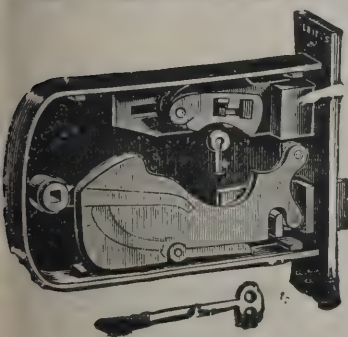
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IPSWICH.—July 16.—For Building Infants' School, &c., to Sunday School. Mr. Wm. Eade and Mr. T. Johns, Architects, Cornhill Chambers Thoroughfare, Ipswich.

KRIGHLEY.—July 20.—For Building Chapel and Sunday School. Messrs. Bailey, Architects, 9 Market Street, Bradford.

KINGSTON-ON-THAMES.—July 18.—For Sewering, Draining, Making, Kerbing, Channelling, Paving and Lighting of New Streets. Surveyor, Clattern House, High Street, Kingston.

KNOWLE.—July 25.—For Six Sanitary Spurs at County Asylum. Mr. James Robinson, County Architect, 13 Southgate Street, Winchester.

LEDURRY.—July 16.—For Erection of Small Clock Tower and Institute. Mr. W. Thornicroft, 6 South Square, Gray's Inn.

LEE.—Aug. 2.—For Erection of Nineteen Shops. Messrs. F. & W. Stocker, 90 Queen Street, E.C.

LIVERPOOL.—July 18.—For Sanitary and other Improvements to Baths. Mr. G. J. Atkinson, Town Clerk, Liverpool.

MAIDENHEAD.—July 17.—For Building Four Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.

MAIDSTONE.—July 24.—For the Supply of Unbroken Granite, 650 Tons; 2-inch Broken Granite, 450 Tons; Unbroken Kentish Rag, 990 Yards; Aylesford Pit Flints, 340 Yards; Aylesford Coarse Gravel, 100 Yards; Aylesford Fine Gravel, 850 Yards; Aylesford Sharp Yellow Sand, 115 Yards; Watlingbury Washed Shingle, 3-inch Screened, 250 Yards; Tarred Ragstone Concrete, 1½-inch Screened, 90 Yards; Tarred Ragstone Concrete, 3-inch Screened, 60 Yards. Mr. F. Bunting, Fairmeadow, Maidstone.

MANCHESTER.—July 17.—For Building Baths at Red Bank. The City Surveyor.

NANTWICH.—July 13.—For Mortuary, Tramp Wards, and Alterations to Closets at the Workhouse. Mr. J. A. Davenport, Architect, 152 Hospital Street, Nantwich.

NEWCASTLE-ON-TYNE.—July 16.—For Building Parish Hall. Messrs. Crawford-Hick & Wilkinson, Architects, 3 Arcade, Newcastle-on-Tyne.

NEWCASTLE.—July 25.—For Construction of Passenger Stations, Felling and Pelaw. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

OXFORD.—July 28.—For Building Corn Exchange, Fire Brigade Station, &c. Mr. H. W. Moore, Architect, 6 Beaumont Street, Oxford.

ROCHESTER.—July 18.—For the Supply of 800 Tons of Broken Blue Guernsey and Alderney Granite, 200 Tons of 2-inch Broken Cherbourg Quartzite, 900 Tons of 2½-inch Broken Kentish Rag Stone, 630 Cubic Yards of 2½-inch Broken Surface-picked Flints, 300 Cubic Yards of Aylesford Sand, and 120 Cubic Yards of Aylesford Gravel. Mr. William Banks, City Surveyor, Guildhall, Rochester.

SCORRIER.—July 17.—For Additions to Railway Station, The Engineer, Great Western Station, Plymouth.

SHENLEY.—July 17.—For Building School Offices. Mr. R. Hooper, Clerk to the Shenley School Board.

SHOOTER'S HILL.—July 19.—For the Erection of a Fever Hospital. Mr. T. W. Aldwinckle, 1 Victoria Street, S.W.

SOUTHALL.—July 16.—For Painting, Colouring and Cleansing Works, Repairs and Alterations at the Parish Schools. Mr. Henry T. Dudman, Guardians' Offices, Northumberland Street, Marylebone Road.

SOUTHAMPTON.—July 27.—For Two Underground Conveniences, Blue Brick Paving, Channelling Works, &c. Mr. W. B. G. Bennett, Borough Surveyor, Southampton.

STAFFORD.—July 16.—For Building South Wing and Children's Ward at General Infirmary and Remodelling Administrative Block. Mr. Ashted Webb, Architect, 19 Queen Anne's Gate, Westminster.

STAPLETON.—July 26.—For Building Board School. Mr. H. M. C. Hurst, Architect, Broad Street, Bristol.

ST. GEORGE'S-IN-THE-EAST.—July 13.—For Painting and Distempering at the Infirmary. Messrs. Wilson, Son & Aldwinckle, 1 Victoria Street, Westminster.

ST. OLAVE'S, S.E.—July 19.—For Repairing, Painting, Distempering and Whitewashing the Interior and Painting the Exterior and Ironwork of Union Workhouse. Messrs. Newman & Newman, Architects, 31 Tooley Street, S.E.

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TOTTENHAM.—July 24.—For Erection of 160 Feet of Fence Wall at the North-Eastern Hospital. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

TORQUAY.—July 16.—For Building Dwelling House, &c. Mr. Edward Richards, Manor Architect, Manor Office, Torquay.

TUNBRIDGE WELLS.—July 27.—For Erection and Completion of Electric Light Station and Chimney Shaft. Mr. Arthur Ardion, F.R.I.B.A., 39 Victoria Street, S.W.

TUNBRIDGE WELLS.—July 25.—For Erection of Sanatorium Buildings. Mr. Herbert M. Caley, Architect, The Broadway, Tunbridge Wells.

UPTON PARK.—July 13.—For Alterations and Additions at the Industrial Schools. Messrs. Wilson, Son & Aldwinckle, 1 Victoria Street, S.W.

WANDSWORTH.—July 18.—For the Supply of 2,000 Tons of Guernsey Granite Spalls. Mr. A. N. Henderson, Union Office, St. John's Hill, S.W.

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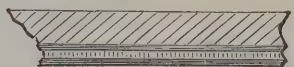


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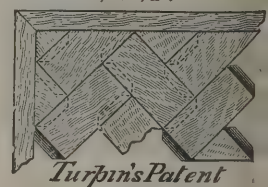
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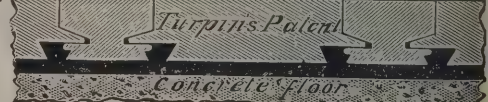
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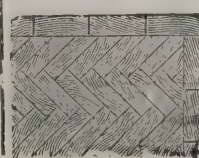
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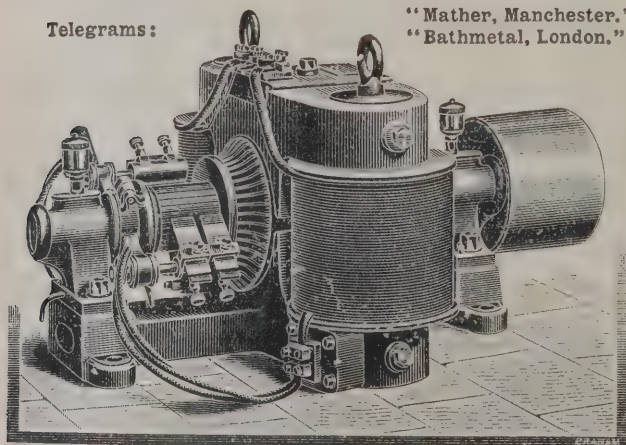
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VARIETIES.

APPLICATIONS numbering 106 have been received by the electric-light committee of the Coventry City Council for the post of clerk of works for the proposed buildings.

DURING the past eighteen months boring operations have been carried on at Dungannon, Ireland, by Mr. Donald Munro, mining engineer, in search of coal. The work, it is stated, has been brought to a successful issue, a seam of bituminous coal, 5 feet 11 inches in thickness, having been struck. The depth at which the seam was discovered is 188 yards from the surface.

IN connection with the restoration of Bristol Cathedral, Dean Pigou fixed the cap-stone of the central tower.

THE dedication of new bells at Solihull parish church has just taken place. The contract was placed with Mr. James Barwell, who has recast the whole peal of eight bells and added two new ones, bringing the number up to ten. They are hung in a new English oak frame, with cast-iron stanchions, and the ringing chamber has been restored by the local amateur guild. The necessary alterations to the fabric of the tower were carried out under the superintendence of Mr. J. A. Cossins, architect.

THE Leeds City Council have agreed to the expenditure of 18,000*l.* upon the erection of four pavilion hospitals for fever patients on the Manston Hall estate.

AFTER considerable delay the Corporation of Monmouth called in Messrs. Bramwell & Harris to report on the seventeen competitive schemes submitted for the sewerage and sewage disposal of Monmouth. These gentlemen have now awarded the premiums as follows:—The first premium of thirty guineas to Mr. W. H. Radford, C.E., of Nottingham, and the second premium of twenty guineas to Messrs. John Parkin & Son, of Westminster.

A STEEPLE-JACK, Mr. John Freeman, aged thirty-eight, employed by Mr. W. J. Furse, electrical engineer, of Nottingham, was removing some spouting on the steeple of Annesley Church, when he slipped and fell, death ensuing instantaneously.

AT the annual meeting of the Midland Counties Institution of Engineers, held at the Stephenson Memorial Hall, Chesterfield, Mr. G. Lewis, of Derby, presiding, Mr. W. Spencer, Leicester, was elected president.

AMONG those who submitted themselves at the technological examinations of the City and Guilds of London Institute, Mr. S. B. Bennett, in honorary plumber's work, has received first prize of 3*l.* and silver medal.

CURTICE'S *Journal of Information* notices that an International Electrical Exhibition will be held in Paris in 1895, from July 1 to October 1.

THE Midland Railway have found electricity too costly for lighting purposes, so they have started large works at Sheffield for the purpose of manufacturing oil-gas. The oil is to be distilled from shale found in Scotland.

IN the annual report of the Free Libraries Committee it is stated that, in consequence of a gift from Lord Hastings, the Town Council have decided to erect a museum on the space in communication with the reading room, the cost being defrayed out of the Technical Instruction Fund. The plans have been prepared by Messrs. Bottle & Olley, architects, Yarmouth.

THE Tower Bridge was opened for a few hours for pedestrians during this week. It is stated that by Monday next it will be fully open for traffic.

THE Walsall Town Council intend to borrow 12,000*l.* or 13,000*l.* for street improvements and other works.

AN address and silver gilt-casket, designed by Mr. Bentley, architect, has been presented to Sir Stuart Knill, Bart., who has done so much in aid of the registration of plumbers, to commemorate his year of office as Lord Mayor.

WE regret to have to record the death of Mr. George Calvert, who died at his residence, Verulam House, Wandsworth, on July 2, from the effects of a paralytic stroke. Mr. Calvert was son of the late Mr. William Calvert, of Islington, and was born March 26, 1836. Mr. Calvert was for about thirty years in the firm of Hobbs, Hart & Co., Limited, lock and safe manufacturers, of Cheapside, and for many years their manager. He had been in failing health for a year or more, and had been confined to his house for about two months. The funeral took place at Wandsworth Cemetery on July 5; there were many of his friends present to hear the last sacred rites read. The mourners were Mrs. Calvert (widow), G. E. Calvert, W. F. Calvert and A. T. Calvert (sons), Miss Calvert (daughter), Mr. Thos. Calvert and Mr. Alfred Calvert (brothers), Mr. A. Freeman (brother-in-law), Dr. Greene, Mr. John Coates, Miss Freeman, Mrs. A. Calvert and Mrs. A. Freeman. The coffin was polished oak with brass furniture, and was completely covered with wreaths.

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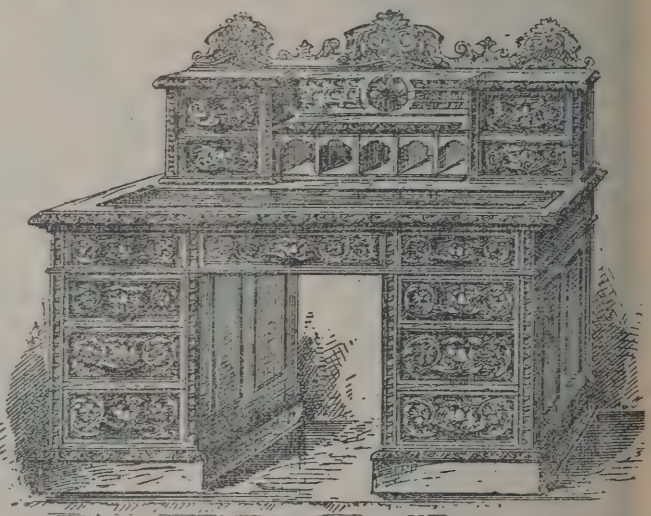
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TRADE NOTES.

At the London Sheriff's Court, Mr. Chewoneth obtained 50*l.* damages for personal injuries sustained through falling over a coal-hole plate in Nelson Street, City Road. It is to be hoped that safety coal-plates will be adopted universally.

At Kirby Moorside parish church, Yorkshire, a fine new clock has just been erected through the generosity of the Right Hon. the Earl of Feversham and a few friends, Mr. J. Frank being chairman, and Mr. R. Jennings, jun., solicitor, secretary of the committee. The clock is constructed on the solid horizontal cast-iron bed-frame, all the bearings of gun-metal, with all Lord Grimthorpe's latest improvements inserted, and the time is shown upon a large dial, which is painted and gilt, facing the Market Place, the necessary work having been executed by Messrs. Wm. Potts & Sons, of Leeds and Newcastle-on-Tyne, who are making the large clock for St. Nicholas Cathedral, Newcastle, and one for the parish church, Stanhope-in-Weardale, county Durham.

We hear that Messrs. E. H. Shorland & Brother, of Manchester, have just supplied some more of their patent Manchester stoves to the Westhulme Hospitals, Oldham, the patent Manchester stoves previously supplied having proved very satisfactory.

ELECTRICAL.

At the monthly meeting of the Rochdale Town Council the health committee recommended that the manure works should be supplied with two new Lancashire 80 lb. pressure boilers and two large destructor furnaces. Councillor Hardman said it was four years since the question was fully discussed by the council, and their plans were approved. During the past four years they had spent 900*l.*, and their now proposed outlay amounted to about 1,100*l.* Councillor Diggle advised the council to put into the sanitary works, instead of 80 lb. pressure boilers, 120 lb. pressure boilers, and with this extra power produce electricity with which to illuminate their public buildings. It was decided to recommend the committee to put into the works boilers of 120 lb. pressure, and consider the proposal of generating electricity for public buildings.

THE *Engineering Record* of New York says it has been officially reported on the Federal Street Bridge, Boston, Mass., that, "As the Federal Street Bridge, which is operated by electric power, is one of the most important bridges with

sufficient work to test it under all conditions, the highly satisfactory results that have been attained at this bridge show that electricity not only is the cheapest power on the bridges, but is also the best."

At the monthly meeting of the Hartlepool Town Council, a recommendation of the lighting committee was adopted empowering the Council to apply for a provisional order for electric lighting powers.

THE *Leeds Mercury* says:—A large number of provisional orders relating to lighting by means of gas and electricity, which have already been sanctioned by the House of Lords, have passed the Committee stage of the House of Commons. Amongst the schemes were that under which the Earby and Thornton Gas Company are empowered to raise further capital for the purposes of gas supply; a similar order relating to the North Bierley Gas Company; and the orders authorising the Yeadon Local Board and the Wakefield Corporation to supply electricity for lighting purposes within their respective districts.

At the meeting of the Ayr Town Council tenders for the introduction of the electric light, numbering in all forty-nine, were submitted. The work was offered for in sections. The lowest offer amounted to 10,138*l.*, and the highest to 16,991*l.* The lowest offer by one firm, the Siemens Company, was 12,760*l.* Mr. Hammond, electrical engineer, stated that the estimates were very satisfactory and came pretty near the estimated probable cost.

BUILDING AND BUILDERS.

ON Saturday, the 7th inst., the Duke and Duchess of Devonshire formally opened the new Royal Infirmary at Derby, the foundation-stone of which was laid by the Queen three years ago. It is estimated that over 100,000*l.* will be required to complete the plans and furnishings. The blocks still to be erected consist of a children's ward and an ophthalmic ward. It is claimed that the hospital, which was designed by Messrs. Young & Hall, is one of the most perfect in the kingdom.

THE foundation-stone of a new free public library and technical school, which the Widnes Corporation are erecting at an estimated cost of 10,000*l.*, has just been laid. The building, it is hoped, will be opened early in 1896.

THE hybrid committee of the House of Commons appointed to inquire into the London Streets and Buildings Bill have passed a clause fixing the maximum height of any building at 80 feet, unless the building is either a church or a chapel.

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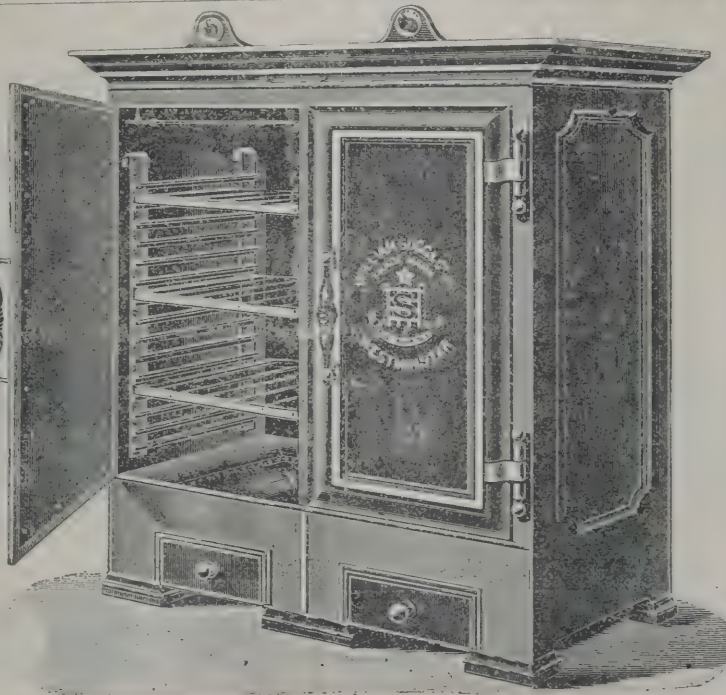
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ILLUSTRATIONS.

THE JUDGMENT OF MIDAS.

BATTERSEA POLYTECHNIC.—GENERAL VIEW.

BATTERSEA POLYTECHNIC.—THE HALL.

THE LATE JOSEPH HILL PADDOCK, C.E.

IN the Transactions of the American Society of Civil Engineers is the following tribute to one of the victims of the recent strikes in America :—

Joseph Hill Paddock was born at East Liberty (now a part of Pittsburgh), Pa., July 30, 1856. His father, Rev. William Perry Paddock, was at that time rector of Calvary Episcopal Church at Pittsburgh (which he founded). From East Liberty the family, in 1872, moved to Philadelphia, where Joseph Paddock attended the public schools. When sixteen years of age he began an apprenticeship as machinist with Mr. J. P. Morris in the Southwark Foundry of Philadelphia, where he remained until the failure of the firm in 1875. These first years of active practical work served, no doubt, to develop and strengthen a natural aptitude for constructive work and a sound judgment regarding practical affairs, which were in later years such marked traits of his character.

Feeling by this time a desire for a more thorough preparation in his chosen field, he entered Lehigh University, and in 1879 graduated with honours, receiving the degree of Mechanical Engineer.

From August to December of this year he was employed by the Cambria Iron Company, when he accepted a position on the Lehigh Valley Railroad at Bethlehem, Pa.

From February to July 1881 Mr. Paddock was employed as draughtsman for the Vulcan Ironworks at Wilkes-Barre, Pa., when he accepted a position as division engineer on the Pittsburgh, McKeesport and Youghiogeny Railroad, under J. Wainwright, M.Am.Soc.C.E., chief engineer. Here his abilities were appreciated, and he was appointed resident engineer in charge of the first eight miles north of Connellsville, which included the Dickerson Run Branch, 3 miles long, all of which work was completed satisfactorily. During this time he also acted as assistant engineer in charge of the construction of an iron highway bridge across the Youghiogeny river, which was quite a difficult piece of work.

In January 1885 he opened an office, in partnership with Mr. A. H. Bowman, in Connellsville as civil and mining engineers, and April 1, 1886, was engaged by the Mount Pleasant Water Company, in the interests of the H. C. Frick Coke Company, to build a reservoir. This work being successfully prosecuted, he was appointed on November 1, 1886, chief engineer for the H. C. Frick Coke Company, which position he held until his death. During this period the coke industry developed at a rapid rate until there were under his supervision twenty-seven coke plants, with their accompanying mines, villages, water supplies and properties, representing in all some 30,000,000 dols.

In addition to this the company undertook in 1889 a topographical survey of the entire Connellsville coke region, which covered nearly 170 square miles, and was completed in 1892.

Altogether the work under Mr. Paddock's direction was of a varied and often of a difficult character, but by his excellent judgment of men and methods of work, by a conscientious thoroughness in carrying out the projects entrusted to him, and by the enterprise shown in the introduction of improved methods and appliances, the works of the company were placed and maintained on a high standard of excellence.

In good health, at the prime of life, and with no personal enemies, his end was as unlooked for as it was cruel.

On the afternoon of April 4, 1894, while waiting for a train at Davidson Station, near Connellsville, with Mr. Hugh Coll, the master mechanic of the company, a mob of Slav and Hungarian strikers came up, with whom he quietly remonstrated against their intruding on the company's grounds. Trouble being feared he had previously been offered a revolver, but had declined, saying that he had no use for it. But now, the men appearing in an ugly mood and menacing them, he and Mr. Coll retreated, but were immediately set upon by the mob. Mr. Coll made his escape, but Mr. Paddock was felled, probably by a stone, and then cruelly beaten and stoned until life was extinct. A bullet wound was found in the back of the head, and although the evidence of witnesses is wanting, it is probable that his sufferings were of brief duration.

Mr. Paddock was married in January 1883 to Miss Carrie Angel, of Cooperstown, who, with three girls and a boy, survive him. He also leaves six brothers and two sisters. Of the former, three are engineers.

Having spent the best part of his active life in a somewhat isolated region, and having rarely taken time for recuperation

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away from home, Mr. Paddock was not so widely known in his profession as he would otherwise have been.

In manner he was genial and cheerful, in his dealings considerate, but, when necessary, decided and firm. To his friends and to those in his employ he was kind and appreciative. By his employers and by the community in which he lived he was highly esteemed. He was a member, and for several years a vestryman, of Trinity Episcopal Church of New Haven, Pa., and in general was a man of upright aims and broad views.

At the time of his death Mr. Paddock was a member of the Engineers' Society of Western Pennsylvania. He was elected a member of the American Society of Civil Engineers, October 5, 1892.

THE BIRKBECK.

THE forty-third annual meeting of the Birkbeck Building Society was held at the offices, 29 and 30 Southampton Buildings, Chancery Lane. The report adopted states that the receipts during the year which ended March 31 last reached 10,014,003*l.*, making a total from the commencement of the Society of more than one hundred and seventy-three millions (173,311,217*l.*). The deposits received were 9,102,698*l.* and the subscriptions 218,366*l.* The gross profits amounted to 220,833*l.* The surplus funds have been augmented by 176,148*l.* and now stand at 5,903,479*l.*, of which 1,732,248*l.* is invested in consols and other securities guaranteed by the British Government, and the cash in the hands of the bankers is 449,814*l.* A further sum of 25,000*l.* has been added to the Permanent Guarantee Fund, thus bringing up the amount to 175,000*l.* and the balance 155,439*l.*, making together 330,439*l.* in excess of the liabilities, the whole amount being invested in consols. The subscriptions and deposits withdrawable on demand amount to 6,053,681*l.* The fourteenth triennial bonus on investing shares has been allotted, and the amount placed to the credit of all shares in existence at the close of the forty-third year is 52,237*l.* The surplus funds (which are invested in convertible securities) are sufficient to pay the depositors 111½ per cent. on the amount of their deposits. The new accounts opened during the year were 11,096, and there are altogether 69,206 shareholders and depositors on the books, and the number of shares in existence is 54,392. Since its establishment the Society has returned to the shareholders and depositors more than one hundred and forty millions (144,460,220*l.*),

the whole amount having been repaid upon demand. The amount advanced to borrowers has been 2,536,343*l.*, and the amount of interest and bonus paid to investors and depositors is nearly two and a half millions sterling, the exact figures being 2,458,987*l.*

CONCRETE CONSTRUCTION.

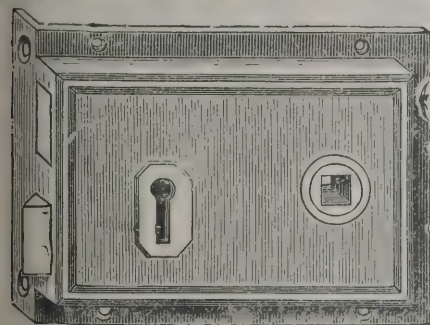
A PAPER was read a few weeks ago before the American Society of Civil Engineers by Mr. F. von Emperger on "The Development and Recent Improvement of Concrete-Iron Highway Bridges," which has appeared in the last part of the Transactions. It described the Monier, Wünsch and Melan systems, in which concrete is employed with the addition of iron netting or stiff rods or bent I-beams, the last having the preference of the writer of the paper. According to him, it is now quite common in Europe to specify vaults with Monier arches and netting for buildings, and they are as common as hollow brick floors are in America. Nearly a million square feet of the Melan type of floor—that is, with arched I-beams—were constructed during the last year. The paper gave rise to several communications concerning the use of concrete in America, some of which we reprint:—

Corydon T. Purdy wrote:—I should like to call the attention of the Society to the fact that the use of steel in conjunction with concrete has already reached a considerable development in the construction of foundations for large buildings, in Chicago chiefly, and in other cities to some extent.

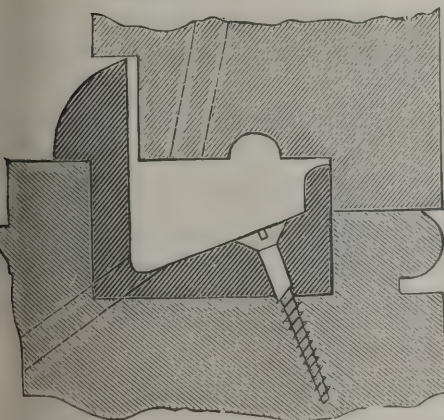
Mr. von Emperger's point, that these two materials are especially fit to be used together, will be appreciated by all of us who have believed this to be true and have shown our faith in that belief by our works. Ever since steel foundations, as they are generally termed, were first advocated, their enduring properties have been questioned, and even to-day some architects in that city will not use the combination. Every item of reliable evidence to show that iron or steel will not deteriorate in concrete, or *vice versa*, is therefore important in its relation to that construction.

A few words in regard to that work may not be out of place. I do not know who first conceived the idea, but it was first used by Mr. Burnham, and he well deserves the credit for its introduction. At first the metal was used only to supplement rubble masonry and concrete; then more dependence was put on the steel, and soon the masonry was omitted entirely, and only enough concrete was used to give the metal a good bed and thoroughly cover and protect it. At first railroad rails were

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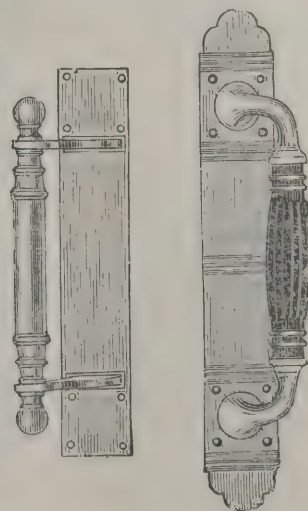


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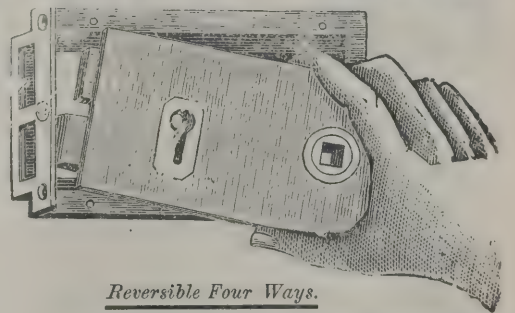


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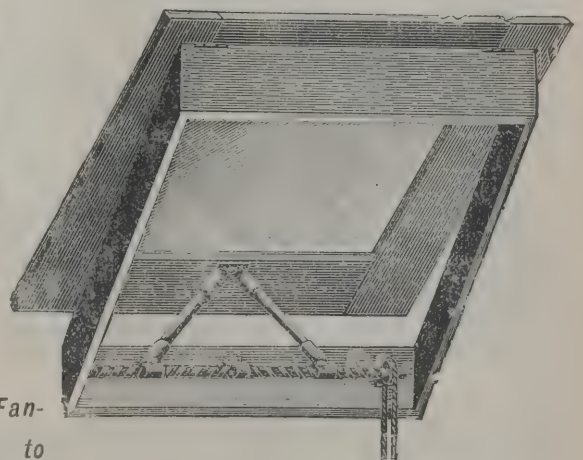
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Reversible Four Ways.



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Prices and Particulars on Application.

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used, some of them old ones; then some beams were used, and as soon as the iron pool was broken, beams were used almost entirely.

In rare instances rivetted work has been used, and a few foundations have been made of light beams. Some thousands of tons of steel have thus been imbedded in concrete in these foundations.

Of course this is not the only solution of the foundation problem even in Chicago, and possibly not the best one, but the demand has been very pressing for something that would provide a large bearing without breaking the clay strata, and yet be so thin in its vertical dimension that the basement room would not be destroyed. The steel foundation was a cheap and natural solution of the problem. It quite completely fulfilled the requirements of that time; and if it will endure indefinitely there are many good reasons why it may well be used for limited loads in all times.

Mr. von Emperger is very definite. He says:—"Concrete is the best conservator of iron." The truth of this statement for foundations or highway bridges, or any other permanent construction for that matter, is fundamental and vitally important. If the perpetuity of iron or steel imbedded in concrete depends on conditions, it also becomes correspondingly important to have these conditions definitely fixed.

Jos. M. Wilson:—"We have been using cement and iron or steel in combination for fireproof floors since 1889 with great success. While not making any special claim for originality in the method employed, yet the exact arrangement adopted by us was a little different from anything that I had at that time seen elsewhere.

The great desideratum in such cases is a system that shall be easy of construction without the employment of skilled mechanics and with a minimum of expense in the manufacture.

The form of construction adopted consists of the ordinary I-beam girders, running from wall to wall, or from walls to columns, placed at distances apart of, say, from 10 to 18 feet, as may be required, between which are hung flat-iron or steel straps at intervals of 12 to 24 inches, the ends of each strap being bent and hooked over the top flanges of the girders, and the straps curved down, so that midway in their length they hang very close to the under surface of the intended floor. A level centreing having been provided, a floor is built in of concrete, completely imbedding the straps and the girders; or, if the latter are too deep for this, it is curved down on to the lower flanges of the girders. The plaster for ceiling finish is

applied directly to the under surface and under the lower flanges of girders.

We have used these floors in the American Philosophical Society building, the Academy of Natural Sciences, and the Drexel Institute, Philadelphia; in the Alumni building of the Rensselaer Polytechnic Institute at Troy, and are now placing them in a large training school in Indianapolis.

Those in Philadelphia were constructed of Portland cement. First, a coating on the centreing of 1 inch, formed of cement and sand, 1 to 2; then concrete, composed of 4 parts stone, to pass through a 2-inch ring, 2 parts sharp river sand, 1 part Portland cement; then a finishing coat on top of 1½ inch, 1 part cement to 2 parts sand, divided up into squares and tinted as may be required for the floor. If a wooden floor is desired, only 1 inch of finish is used, and nailing-strips, to which to nail the flooring-boards, are bedded in light filling on top.

In the American Philosophical Society building the spans for the first and second floors run from 8 to 16 feet; for the former the straps being ¾ by ⅝ inch, 24 inches to centres with concrete 4 inches thick, including finish; and for the latter the straps are 2½ by ⅝ inches, 24 inches to centres with the concrete 7 inches thick. These floors were intended for 80 lbs. live load.

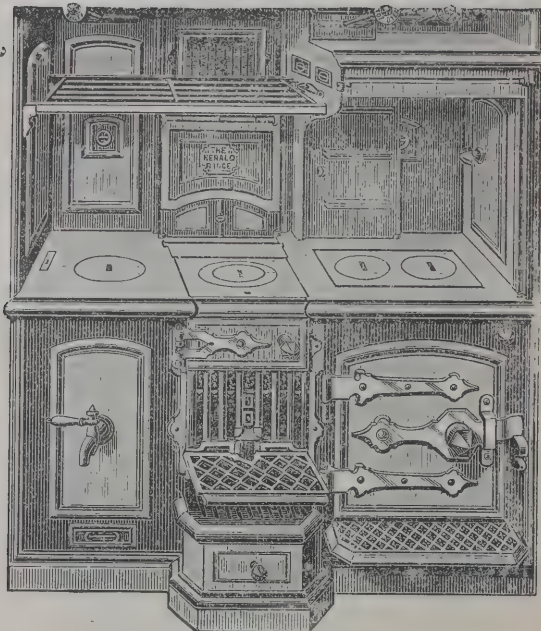
The third floor, of 16-foot spans, carrying 210 lbs. loading to the square foot, being a library floor, has straps 2 by ⅝ inches, 12 inches apart and concrete 8 inches thick.

The Academy of Natural Sciences has five floors and roof 17 to 18 feet spans, all constructed in this way, the floors having 8 inches of concrete and straps 2½ by ⅝ inches, 18 inches apart; live-load 100 lbs. to the square foot. The work has finished up beautifully without a sign of a crack or defect anywhere.

In the Indianapolis building there are about 67,000 square feet of flooring to be laid. The concrete is to be of Louisville cement, 1 to 3 parts crushed stone with 1-inch finish on top of Dyerhoff cement and sand, 1 to 2. The spans are about 11 feet, the straps or bars 1 by ¼ inch, 12 inches apart and the concrete 7 inches thick, lightened up with open cores running through between and parallel to the straps. This floor, which is to be constructed by a Cleveland firm, has been placed, at so reasonable a figure as to compete successfully with wooden mill construction.

The Society may not be aware that a small concrete bridge was constructed last year over the Pennypack Creek, in Philadelphia, by the city authorities. The engineer, Mr. Carl A. Frick, states that it consists of two arches 25 feet 4¼ inches

RUSSELL'S PATENT COLLAPSIBLE OVEN RANGE

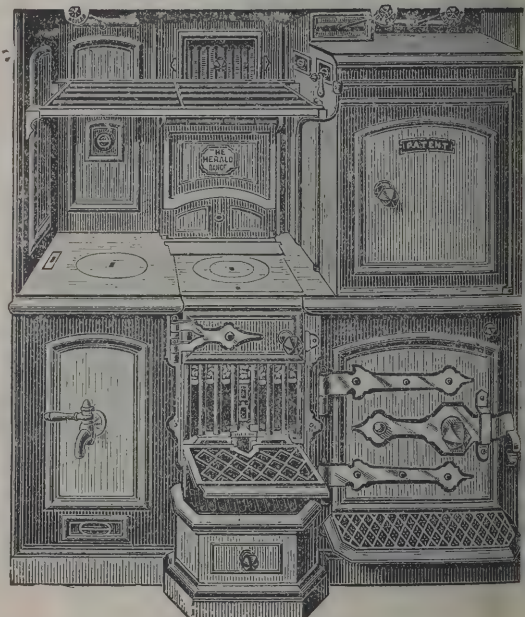


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The Oven can be folded up in a few seconds, and the Hot Plate left clear for any other purpose. It will do double the work with less fuel than any other range made. It is fitted with our patent "Herald" lifting fire, with improved wrought-iron spindle-bars, so that it will toast or roast before the fire, which is almost an impossibility with any other lifting fire-range.

These Ranges are also made with double oven, as well as oven and boiler.



TOP OVEN IN ACTION.

TESTIMONIAL FROM FRAULEIN NOEDEL, Lady Superintendent to H.R.H. the Princess of Wales's Technical School, Sandringham.

"Sandringham, Norfolk: Sept. 23, 1891. SIRS,—After using the 'HERALD' Range in H.R.H. the Princess of Wales's School of Cookery for more than a year, I pleasure in testifying to its thorough efficiency in every way. It uses comparatively little fuel, keeps pots boiling on every part of the hot plate, the ovens bake well, and it supplies us with plenty of hot water. Believe me, SIRS, Yours truly, CHARLOTTE NOEDEL, Lady Superintendent to H.R.H. the Princess of Wales's Technical School."

Drawings and Particulars will be supplied direct from the Patentees and Manufacturers, BUT ALL ORDERS MUST BE SENT THROUGH AN IRONMONGER.

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span each, with rise of 6 feet 6 inches, and is built on a light skew; width out to out of parapets, 34 feet. The depth at crown is 2 feet 3 inches; the abutments, 7 feet in thickness, and the pier, 6 feet. The spandrel walls, 3 feet at the springing line and 2 feet at the coping. The entire work (foundations and all) has been constructed of concrete, German Portland cement, some portions being mixed of 1 part cement, 2 parts sand, 6 parts broken stone, and other portions of 1 part cement, 1 part sand, and 4 parts broken stone. Wire netting, $\frac{1}{4}$ -inch wire, 12-inch mesh, was placed in each layer of the concrete.

It is stated by the engineer that a saving was effected in cost of about one-fourth over that of a stone and brick bridge. Without taking up an analytical consideration of the bridge, the depth of the arch appears to be much heavier than necessary for the span, and it is probable that with a closer approach to the vertical limits, still more saving in cost might have been effected.

Mr. George Hill wrote:—The various methods suggested for the spanning of openings by means of systems less expensive than those in use at the present time, while equally enduring and strong, have been followed with much interest by engineers. We are therefore much indebted to Mr. von Emperger for the very interesting description of the Melan system.

So far as its use for highway bridges is concerned, I refrain from expressing an opinion, since that is outside my line. We are told, however, that it is coming into extensive use for floors in Germany, and it is intimated that it would have an extensive use in that direction in this country, and it is concerning this that I wish to speak.

It is true that the actual area of floors laid in it so far is relatively small as compared with the use made of the better known styles of fireproof floor construction in this country, but it is very much in excess of any record which we have to show for the first year after the introduction of any of our materials, and it therefore behoves us to examine the system with a great deal of care before expressing an opinion. Analysing the arch, we find the compression is in part taken up by the concrete, and in part by the curved metal ribs; that the thrust is absorbed by the abutments, as shown by the drawings, or presumably by tie-rods in building construction, and that we further cause the concrete to act as a beam between the curved ribs, and compel it to do all of the work of which it is capable in that position. We must use the concrete in this latter way, and it is not good engineering to add to this duty an additional

one by making it act as an arch, thus putting the fibres under a maximum strain in two directions. Mr. von Emperger cites tests also which show a bending moment at the haunches which is apparently far beyond the strength of the concrete to resist, acting as an arch, but which is readily carried by it to the curved ribs and by them resisted. Taking this view, we should simply calculate the concrete as a beam between the curved ribs, establishing proper ratios at once for span and depths, and calculate the ribs for the strains which are imposed by the live and dead loads acting as arches. Under this supposition, we would have the same amount of metal required as in a beam, minus the web.

In considering the use of such a flooring we have:—

First.—The use of curved ribs which require careful mill-work, and, in order to secure the results which are aimed at by the author of the paper, a close union between the concrete and the iron, all the metal must be free from rust until it is used in the building.

Second.—The cement must be of uniformly high grade.

Third.—The workmanship must be honest, and such as to insure a proper use of the materials.

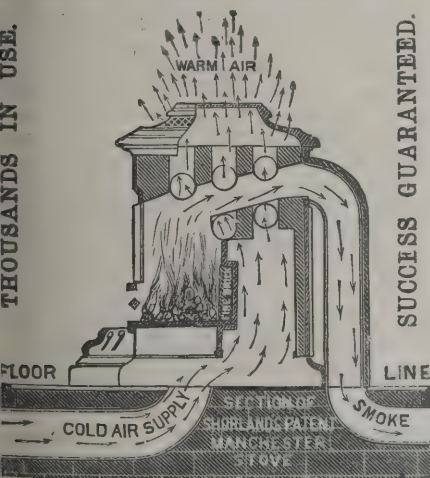
Fourth.—In at least 50 per cent. of the cases a suspended ceiling must be provided, so as to make the bottom surfaces absolutely flat.

In addition to these difficulties, there are those existing in the actual construction, which those who have devoted their entire attention to the engineering of building know to be almost insurmountable. These are:—First, with regard to the proper use of cement; second, the time which must elapse before loads can be applied; third, the lack of fireproof qualities. In engineering structures we have an inspector, thoroughly competent, constantly upon the work to see that every portion of the mortar is used under the most favourable conditions. In buildings this cannot be done, and reliance therefore must be had, to a greater or less extent, on the knowledge of the men, who, with the most honest intentions, constantly use retempered mortar, mortar that has been far too highly dosed with sand, or contains at least 50 per cent. too much water. As a consequence of these conditions, we have established the general rule that no cement should be used in tension, and that the tensile strength of the cement should not be relied on, which, if followed, would at once bar out this system.

This is said with the full knowledge of the work done by Mr. Wilson and others, and with the further knowledge that the

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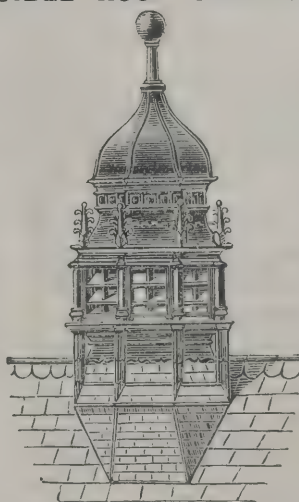


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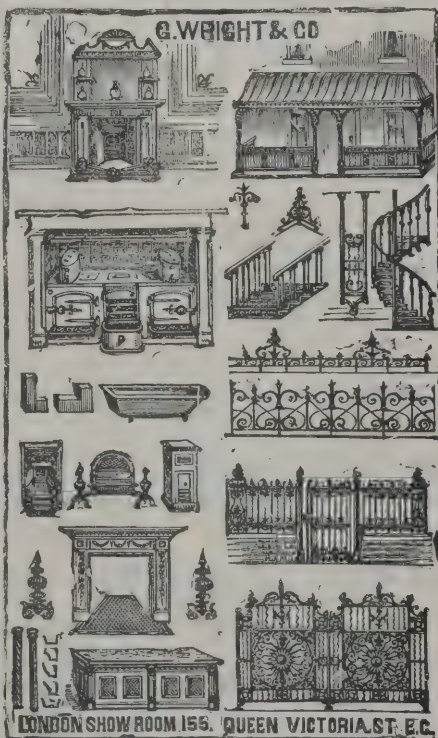
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concrete arches in use here generally only rely on the compressive strength of the concrete and are so lightly loaded under usual conditions that well-dried mud would do equally well, if given a good wearing surface, until the crucial test came. Were we able to get thoroughly first-class concrete for floor arches we could adopt the principle described by Mr. Wilson in a more economical form by using steel wire of double the strength of the plates he uses, and save probably 50 per cent. of the weight of the floor framing. Companies have been formed to exploit such a construction, but they have not had marked success.

We must also remember that the general use is the one to be considered, and that the building departments of the various cities in this country have had so sad an experience when trusting to the honesty of the builders that they condemn any system which is not of the simplest character and which depends on so many elements for its success.

In a country where eight months is sufficient to practically complete a building costing nearly 1,000,000 dols., the statement that nearly three months must elapse before the arches can be fully loaded would of itself bar them out, since often the heaviest load an arch is called on to sustain is that due to the storage of materials, and is applied before the arch is five days old and after the centreing is removed.

We know that cement has been subjected to intense heat in the process of manufacture, but we also know that when heated again parts are apt to fly off, and especially where the cement is thin, as under the flanges of the beams, where it is most needed and where it would certainly fly off if touched with a stream of water while hot, thus leaving the beam unprotected against subsequent attack.

Concerning the relative strength of the two forms when used for floor construction, there is no question in my mind but that the flat arch floor is the stronger under all similar conditions of treatment, since it uses mortar in compression only; can be laid up without mortar, if desired; utilises each material in the best possible way, and in such a way that long-continued vibration cannot in any way injure it. The question of relative strength is one that we are likely to disagree upon for some time still, but, briefly summarising the tests, we know that the fireclay alone will carry about 2,000 lbs. per square foot, in compression; that the only tests to destruction of flat arches showed that the skewbacks were very weak, shearing off under about 1,000 lbs. per linear foot; that properly designed skewbacks have carried as high as 5,000 lbs. per linear foot without

failure. That in the ordinary flat arch there is an area transmitting compression of about 30 square inches and a joint area of about 144 square inches in the comparative case given, and therefore we should have a safe uniform load on this 12-inch arch of (safety factor, 10):—

$$L = \frac{W}{5.58} = \frac{8 \times 30 \times 8 \times 200}{67 \times 5.58} = \frac{384,000}{373.86} = 1,027.$$

This is on the assumption that the whole area of the arch acts; if only three-quarters acts, then the load becomes 777 lbs. per square foot. This uses only well-known formulas, and a conservative value of the crushing strength. With the Melan system, we must assume the extreme fibre strain at 90 lbs. per square inch, in order to obtain a reasonable thickness of slab between arch members, and this is confessedly very high.

Mr. Joseph M. Wilson wrote:—I think I stated clearly that I made no special claim to great originality in my form of construction. I am aware that construction of a general character similar to what we have adopted has been used in San Francisco and perhaps in other places, the detailed arrangement in our case being different. Some of the floors we have built have been finished now for four or five years.

It is possible that the building laws of the city of New York may prevent the use of floors constructed as these are, but I do not think that one of the reasons mentioned, to wit, the question of the builder not doing his work properly, should be an excuse for its rejection.

So far as plastering is concerned, the ceilings were plastered directly on the cement, and there has been no staining or other trouble with them. The ceilings in the extension to the Academy of Natural Sciences in Philadelphia could not look better. They can be considered a perfect piece of work, although they have been exposed all winter without heat in the building, as no boilers have yet been provided, and the building has been up since last fall. The work could not be in better condition than these ceilings are.

I think also the question of expansion and contraction is somewhat of a bugbear. In buildings the conditions are a little different from those of outside work. The variations of temperature are never very great, as the walls protect the interior from cold in winter and heat in summer, and in winter there is always artificial heat when the buildings are occupied. I do not think the extremes are very great in any of our buildings.

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AN AMERICAN BUILDER'S NOTIONS OF EUROPE.*

EUROPEAN travel has become so general within the past few years that I shall not attempt to give any descriptions except those that are particularly interesting to us from a builder's point of view.

I have always looked forward to a trip across the Atlantic with pleasant anticipation, knowing there were many things of interest to see, customs, manners, &c., being entirely different from what we are familiar with here. I will not take your time telling you of the buffeting of the waves and all that, but suffice it to say we had a fairly good voyage.

Crossing by the southern or the Mediterranean route, as it is sometimes called, the first land to meet our eyes was the Azore group of islands. We did not go near enough to see anything more than the peak of Teneriffe standing up some thousands of feet. A thousand miles on and we are at Gibraltar. It was late in the afternoon when we reached there, and we did not get as good a view as I would have liked. We had several hours to wait, so went ashore in a small boat.

Here was found a strange sight indeed. A bright moon-light added to the picturesqueness of the scene. As in all tropical countries, the people pass most of the time out of doors, and a continual crowd was passing, laughing, chatting, singing, smoking, and most gaily amusing themselves and strangers. The guitar and mandolin were tinkling all the while, and taken altogether it was a strange and beautiful sight to us, coming from prosaic New York.

Resuming our journey, we had the Spanish coast with its rugged mountains sloping to the water's edge on our left, and the African coast on the right. We could get a glimpse of some of the towns, but the distance was too great to distinguish anything but the lights.

When crossing the Gulf of Lyons we are out of sight of land entirely, and the next point is the harbour of Genoa, and the city so beautifully located and presenting so enchanting a picture from the water that it has been called "Genoa the Suburb."

The mountain side upon which the city is located makes

the first impression that you have of the city, that the streets are extremely narrow and few in number. But when ashore that is dissipated, and we find them wide and very numerous, but crooked, as the steep hill requires many to be made in zig-zag to overcome the ascent.

The first place we visited was a palace, old in years but in a fine state of preservation. The interior walls were beautifully finished in marbles and stucco; frescoes, mosaics, pilasters of the most costly character are in every room. The owners at one time must have possessed great wealth.

The carpenter had very little to do in the construction, but the mason is everywhere.

One thing that greatly interested us was to see an aqueduct here and there distributing water on a level with the second storey windows, from which the occupants received their supply; there are only a few, however, so fortunate, the most of the people have to buy it in the streets. All the principal streets have mains, and it is distributed the same as here, but the plumbing question is far behind the age; and even in the best hotels it is only a cold water faucet, all the heating being done in vessels over fires.

One of the principal sights of Genoa is the Campo Santo, or home of the dead, which I will briefly describe to you.

Madison Square, enlarged five times, will give you an idea of its size. The building surrounds this square. It is about 40 feet wide and 30 feet high. Below the floor are the vaults for the dead. Any one can purchase a place of interment in size according to his means or inclination, and this carries with it wall space, on which are placed memorial tablets and statuary.

In front of many of the sarcophagi are groups of statuary, some life-size, of living relatives in attitudes of mourning, and the likeness to those living ones is said to be very faithful.

The distance around is over a mile. In the hollow square inside are the usual crosses, wreaths, &c., and altogether it is a very strange and beautiful place, well worthy of a visit.

From Genoa to Pisa we pass by the famous Carrara quarries, that we use so much of here. While we were there a strike of the workmen was in progress and assumed such proportions that the Government had to call out the troops to suppress it. The previous day the strikers had fired upon the trains, and, as a precaution, we were advised while passing by to keep well back from the windows. We obeyed orders, and fortunately passed through without any difficulty, not a shot being fired.

* An address delivered by the Hon. John J. Tucker before the Building Trades Club of New York City, and published in *Architecture and Building*.

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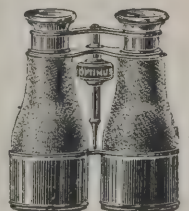
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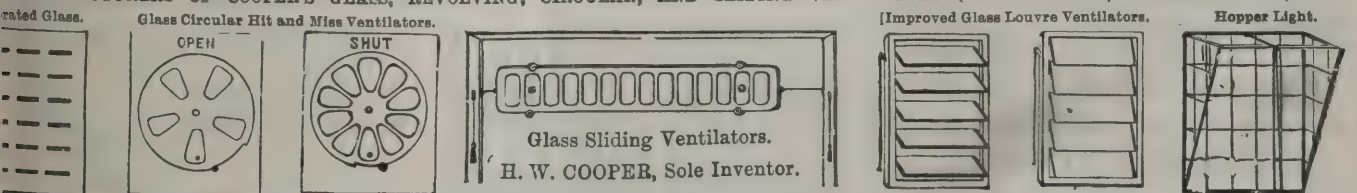


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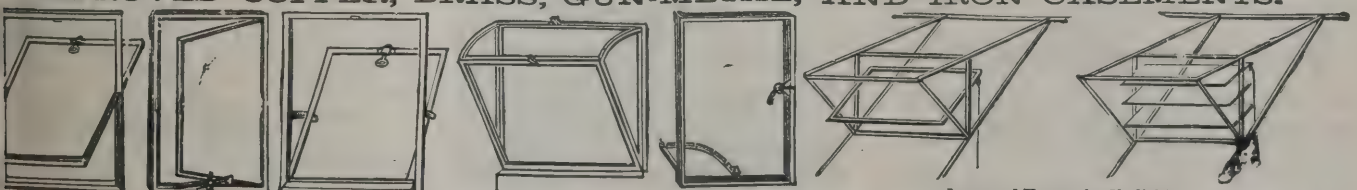


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Pisa is an old city, but has nothing to interest a tourist except the Leaning Tower and accompanying cathedral.

The tower, as nearly as I could measure it, was about 70 feet in diameter and 194 feet high. While on the top you cannot get rid of the impression that it is about to fall; in reality it is very strong and there is no danger.

A great many conclusions have been given as to its present position, some claiming it was designedly built as it is to demonstrate some question in mechanics. I do not agree with that idea. After a careful scrutiny and examination I am satisfied it is simply a case of settlement; some want of solidity in the ground has caused it all, and it has very slowly assumed the position it now holds. Had it gone down suddenly it would surely have fallen, but a very gradual settling has brought it to its present position, and it is now fixed, as it has not increased the deflection even a fraction of an inch in very many years.

Close by is the Baptistry, which has a most remarkable echo, and standing in certain positions the slightest sound is repeated a number of times.

From here we go on to Rome, the most interesting city in the world, being, as it is, the connecting link between ancient and modern times. No other city has such a wealth of historical associations, and time could be spent by months in looking up its great storehouses of attractive subjects.

Old Rome is fast disappearing. New avenues are being cut through and beautiful structures erected, and in a few years it will be a modern city, with all the facilities and conveniences of a new one.

This modernising is fast demolishing the old and picturesque, and it was very interesting to note the interiors of some of these buildings. Barns, we would call them, as far as anything goes to make a comfortable home; but what a wealth of decoration. Frescoes and stucco in the greatest profusion. And what elaborateness of detail and beauty of colouring. Some of these frescoes were centuries old, yet the colouring was as bright as if finished but a few months.

Of course, one of the first things a stranger wants to see is St. Peter's, and I was no exception. It certainly is a most remarkable building, and in its detail possibly the most perfect in the whole world. The exterior is a disappointment, for you cannot find a point of observation from which you can get a view of the structure as a whole, and in consequence have to be content to look at it piecemeal. The interior is grandeur itself. The walls are covered with most beautiful and costly

marbles, and the ceilings with mosaic and fresco. The immensity does not at first impress you, but, like Niagara, the longer you look the greater it becomes. So perfect has the detail of construction and decoration been carried out, your eye sees harmony in every part.

As an illustration. At the spring of the dome are the pictures of the four apostles in mosaic, and, looking from the floor, they seem to be about twice life-size. Climb the stairs to the gallery which is at the level of those pictures, and we find those faces are more than 4 feet across, and the pen St. Paul holds is 6 feet long.

From the top of the dome a most beautiful view of the city is obtained, and the Sabine Hills in the distance, snow-capped, make a charming frame to the picture.

We will now go to the Colosseum, the scene of the games and combats of ancient days. This is the largest and most impressive ruin. In size we can call it about 1,000 feet by 600 feet, and the outside walls are nearly 200 feet high.

At first we are awe-stricken when we think of this structure standing some 2,000 years, but a close examination reveals no reason why it should not. The climate is mild and not destructive—a great point. Then let us look at its construction. A glance would indicate brick and stone walls, but it is only superficial. The faces are brick, with some ornamental stone at openings, &c.; the interior of the wall is plain concrete, in many places 20 feet and more in thickness. One storey is placed above the other in the same order, only each is lighter in construction than the one below until we reach the top, where the average thickness might be 3 to 4 feet. As a specimen of masonry it is nothing, and not to be compared with modern work, but as a gigantic edifice and monument of labour it is the most remarkable, outside of the Pyramids, now existing. It could hold an audience of 100,000; just think—a large city.

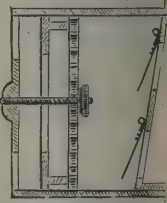
We will now visit the Baths of Caracalla, I think more remarkable for many reasons than the Colosseum. While only a small portion of this structure is now standing, enough remains to show what a wonderful creation it must have been. History says this building was erected by the Emperor Caracalla in four years. The baths, as existing at that time, were visited only by the nobility. This was the club, the political headquarters, and the resort of all the pleasure-seekers. The entire space covered was about 1,600 feet square. The interior was divided into three parts—hot, cold and tepid, each one with a beautiful court and numerous retiring-rooms. Sixteen hundred could

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bathe here at one time. The walls are similar to those of the Colosseum in construction, and underneath the main floor were the furnaces to heat the air and water. This heat was carried through flues in the walls made of clay pipe, such as we are using for flues now, of various sizes, and it is no exaggeration to say that there must have been millions of feet of them. Although the body of the walls is concrete, it requires millions of brick for the facing. And now the most remarkable part. The entire face of those walls, inside and out, was covered with most beautiful marble, carved and decorated in a most elaborate manner, and all the floor was marble mosaic in handsome design. There are many hundred feet of the mosaic tiling still to be seen, and they have excavated pieces of the marble cornice and wall decorations, such as panels, pilasters, columns, &c., which have been placed in their original position, to show how the building looked when in perfect condition. It is no exaggeration to say that the combined work of all the marble workers in this country with all their machinery could not get this marble out in the time the structure was completed (four years). How this multitude was handled it is impossible to realise, and the statement has been made (on what authority I cannot say) that 150,000 men were employed on this work, directly and indirectly. At any rate, even in this era of rapid building, I do not think any person would be mad enough to say he could duplicate it in the time.

All of this work is masonry; while they did not use iron to any extent, we do find in many of these ruins bronze very largely employed for anchors and for tying in large stone, and the secret of those walls standing so well is on account of the solidity and compactness. When the walls are broken through they are perfectly solid, no spaces—all is merged into a mass that, through crystallisation, is now as hard as stone itself. In its composition it is what we would call good mortar, no Roman cement that we have always heard so much about.

The Pantheon is another old edifice, dating back to the time of Christ and is in most excellent preservation. Victor Emanuel's tomb is here, and services are held there daily. The peculiarity of the building is that there are no windows—all the light comes in through a circular opening in the top of the dome. It is entirely open, and as it was raining when I visited it, the floor underneath was as wet as the sidewalk outside.

In front are a number of granite columns, 16 feet in diameter and 50 feet high, monoliths. They were brought from Egypt, and how they ever handled them is a problem to me.

There are several forums still in an excellent state of preservation. Here was in ancient days the centre of commercial life. Here the bankers had their stands, the lawyers their headquarters, and the proclamations of emperors were read. In fact, the forum was the centre of all but the social life. I think we do better to-day in distributing these important functions.

From Rome to Naples we pass by some of the aqueducts that supply Rome with water. The country adjacent to Rome is level and a little swampy, so these aqueducts are built on a series of arches about 40 to 50 feet high and have a conduit of about 5 feet square. One built by Nero is still in use and in good condition apparently.

The old road from Rome to Naples is still in use and you will recall it from Biblical associations—the Appian Way. The nobility erected mausoleums along the roadside and the ruins are seen for miles. The roadway is paved with large flat stone worn into ruts 6 and 8 inches deep. It is time for reflection, as we ride along and think of this old highway, the millions that have passed over it and the scenes enacted upon those old, worn, silent stones. Armies have gone out with banners flying to return crushed and beaten; slaves have come into Rome by this road, never again to see loved ones or native land, and so on. What a volume could be written. And if those stones could talk, what a story.

From Rome to Naples the country is very fertile and we had a good chance to see the peasantry till the soil. There are no ploughs, as we understand them, but spades, all spades, a row of sixty or more all turning over the soil by hand. At first you think it very slow, but, not having to dig deep, it is astonishing how much ground they can cover in a day. The country through here is largely given up to vineyards, and this will show how they economise. They plant trees, what we would call scrub poplars, cut off the tops when up the required height, and train the vines over them. When the sprouts come out and reach a length of 3 or 4 feet they are cut off and brush brooms made of them, which are sold in the streets of the city.

The railroads in Italy are controlled by the Government and kept in most excellent condition. The road-bed is well ballasted and the cars clean. The speed is not equal to that of our trains, but the people are not in a hurry, so what difference does it make whether it takes three hours or four hours if you get safely to your destination? The first-class carriages have all the conveniences, but not the second or third class. The

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Old Vesuvius is the first thing to strike your eye on reaching Naples, and it is a grand sight to see that old chimney-pot belching out the smoke.

The most important point to a tourist at Naples is the ruins of Pompeii. This city and also Herculaneum were destroyed by the eruption of Vesuvius. Herculaneum was buried in lava, and, of course, totally destroyed, so it was useless spending time and money trying to discover the remains. Pompeii, however, was buried in ashes, and while it has been an expensive matter to remove the immense amount of ashes covering the city it has been successfully done. The Government has prosecuted this work in a most careful manner; in fact, after a certain portion was removed by shovels, for fear of destroying or injuring the work the rest was all removed by hand. Everything is allowed to remain standing, as far as possible, and we saw many walls and columns twenty and more feet in height. Strange as it may seem, we saw in some rooms beds built of masonry. In fact, it is all masonry; wood does not seem to have entered into this construction. Almost all the walls are frescoed, and the colours are still as bright and the design as plain as when this calamity occurred. In the museum we saw bodies which had been exhumed and thousands of relics of all kinds, which awaken a curious interest when you think these people perished nearly two thousand years ago and that you are looking at their household utensils, jewellery, &c.

Naples is a very beautiful city, as regards the view from a distance. It is the largest in Italy, having a population of 600,000. The streets for the most part are fairly wide and are kept well, except along the water front, which is dirty in all cities. There are several large museums well filled with historical and other objects, and the paintings are numerous and valuable.

Naples has the reputation of having more poverty than any other city in the world, and possibly it is so, but you do not see it. The Italians have been compelled to practise the most rigid economy for years, and they know how to make the most of everything. If you patronise the first-class hotels you will find the prices equal to those here, but of course there are many grades of hotels. After the hotels come the vendors of food, whom you will see in large numbers in the streets. They carry a little charcoal furnace, and will cook you a chop, sausage, fish, or whatever they may have, while you wait, and for three or four cents a very passable meal can be had. I

don't suppose we would care for it, but it answers for the class it is intended for. I noticed one remarkable thing, and that was there were no barefooted people to be seen; bare heads in plenty, but all had shoes of some kind.

The curse and burden of the Italians is the everlasting tax. Nothing is spared—the food they eat, the clothes they wear, the water they drink, everything except the air is subject to a tax. Those in the cities have more severe burdens than the peasantry, but it is always tax, as the army and navy must be supported.

From Naples we go to Florence, a most interesting and beautiful city. The streets here are narrow, and the absence of building laws allows an owner to do as he pleases, so you see bay windows and all kinds of encroachments wherever you go, but the streets themselves are well kept, which, in fact, is true of the streets throughout Italy.

The renowned galleries the Pitti and Uffizi are in this city, and, as collections of paintings and sculptures, are not excelled in all Europe. The cathedral is one of the finest in Italy, and has examples of mosaic and stone carving considered by experts to be the most perfect in existence. The baptistry of this cathedral has a pair of bronze doors, considered the finest in the world for beauty of design and execution. They are divided into a number of panels, each one a Biblical subject—the figure in miniature, but perfect. Some years ago it was decided to have a pair of duplicates for the Capitol at Washington, but the subjects were not considered appropriate for a civil building, and the design was abandoned, and the panels are made to contain subjects from American history.

Speaking of the condition of the streets, I might say here that when any repairing is required it is attended to at once and then enclosed, so it is perfectly set before any vehicles are allowed to pass over it. The water and gas are controlled by the Government, so there is no tearing up of the streets for new mains, &c., every few months.

We now go on to Venice, "The Bride of the Sea," as it is rightly called. Originally a cluster of small islands, they commenced by driving piles and filling around with concrete to form a foundation, and on this they erected their houses. The city has now some sixty or seventy islands connected by three hundred and more bridges. Everything is transported by gondolas. Not a horse or a wheeled vehicle in the city. On the Grand Canal there are some small steamboats, and during the past six months some electrical and naphtha launches have been introduced, but the great bulk of the travel is in gondolas.

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The people as a whole do not keep house. Most of the meals are taken in cafés or else purchased cooked at the stores and heated on a charcoal stove. While this mode of living is prevalent throughout Italy, Venice, I was told, has more cafés and delicatessen stores than any other city. The palace of the Doges and St. Mark's are the principal buildings of interest and they both deserve a careful examination, not only on account of their beauty, but for the excellence of the construction which has enabled them to stand for centuries with so little signs of decay. In the palace I saw some filigree work which I had admired in a New York house and was told it was more than three hundred years old, so I am satisfied that while our modern construction may be an improvement the decoration has not very much improved in some departments. The cathedral contains some of the most beautiful mosaics in glass that can be found and the marble mosaic floor is a study. There are in it some six thousand squares and no two alike.

Our next point is Milan, and to many this is the handsomest city in Italy. The streets here are wider than any we have found and the buildings are bright and cheerful and have a more modern appearance. The cathedral is an architectural study and a most remarkable building it is, second I believe in size in the world. While St. Peter's is noted principally for its interior, this one's reputation is for its exterior. The material is white marble and the walls have some six thousand statues of saints, no two alike. The finials on the flying buttresses all end in a flower, of which there are eighteen thousand, no two alike—so I was told; I did not verify the statement. It is a wonder and well repays a careful study.

From there we go on to Paris, by way of Switzerland. The scenery is most beautiful and deserves all the praise that so many travellers have accorded it. Paris the gay, the capital of France, is all that has been claimed for it—the brightest and liveliest city in the world. The streets are broad and paved with wood and asphalt, and as clean as possible. I have never seen such clean streets. The system of cleaning them is perfect. Every little way there are iron receptacles for the dirt and rubbish, and men are continually dodging in and out among the vehicles, cleaning continually. The gutters are flushed every night by means of pipe connection with the mains, and we could well profit by adopting the same means here.

One of the beauties of Paris is the lining of trees along the boulevards and principal avenues, so that when you take a birdseye view from some high point the green foliage is a relief from the brick and mortar. In a general way Paris is a tedious

city to look at, architecturally speaking. The authorities decide upon the elevation for an avenue, and no owner is permitted to alter it. With the interior you can do as you please, but the exterior is fixed. This makes the appearance of the buildings monotonous, and you do not have the variety you find in our American cities. There are advantages in each method, and nearly all the European cities that are making any extended improvements are following the Parisian idea. At any rate, whichever may be the best, you need never fear that an adjoining owner may put up a structure 500 feet high and depreciate his neighbour's property.

Building operations there are conducted much more slowly than here. You cannot make use of the streets for materials; they must all go inside, and consequently can be brought only as fast as wanted. There is no comparison in the methods of mason, carpenter and ironwork; in fact, regarding the use of iron, they are far behind us, and iron does not begin to play the important part it does with us.

In Brussels I did not find any activity in the building line. The general appearance of the city is similar to that of Paris, except in the old portions, where are still found some beautiful specimens of Flemish architecture.

Antwerp is a mixture of Dutch and Flemish, but the style is quaint and very interesting.

The Hague, a few hours on, is a most beautiful place. The buildings have a neat and clean appearance, and all shows the thrift and careful attention to little things which is so characteristic of the Dutch.

Amsterdam, the Venice of Holland, is a charming city. The whole appearance of the buildings and people impresses you at once that you are among a people of wealth and importance. The colonies of Holland have brought great wealth to the country, and here we find the headquarters of the commerce of the East Indies. I found a great deal of building going on, and it was of a fine and durable character. In fact, the bricklaying and stonework was more like our own than any I had seen.

From here we go to London, the greatest city of the world. You cannot imagine what it is. We have a pretty good idea in New York of what a large city is, but the concentration of people is so great here we can form no idea of the moving mass without actually seeing it.

There is very little building being done here and I had very small opportunities to compare the methods and work, but from what I did see I do not think we can get any points. In



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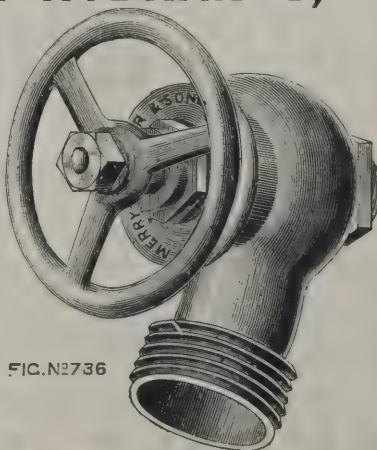


FIG. N2736



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a general way I should say they are building as we did twenty-five years ago, heavy walls and fireproof construction only in a few cases, but so massive are their structures that fires rarely occur. It is unfortunate that the climate is so severe on the buildings, the fog and smoke destroying the appearance of the finest buildings in a few years.

As an interesting city to a tourist too much cannot be said, and on every hand we found something to claim attention; but we are travelling as builders and must prepare to again cross the broad Atlantic, bidding farewell to foreign lands and all anticipation for a view of our own country.

Briefly summarising, I can truthfully say that as mechanics we are in the first rank, and considering the character of our structures and the conveniences they afford the occupants, we are superior to the entire world. And in all branches of the building trades you can find examples here that cannot be duplicated in any part of the world outside of our own country. And I believe, were some of our most famous commercial buildings to be erected in any European city, to carry out every detail it would be necessary to have some American mechanics to do the work.

EXTENSION OF THE CHESTER ASYLUM.

A SPECIAL meeting of the Cheshire County Council was held at Chester Castle on June 28, when the following resolutions were adopted:—1. That in the opinion of this Council it is expedient that the county should continue to provide asylum accommodation for the pauper lunatics of the county boroughs of Birkenhead and Stockport (Cheshire portion), provided such boroughs enter into an agreement to be prepared by the clerk of this Council, embodying the following provisions and such others as he may consider necessary, for the protection of the interests of the county, viz. (a) that the contributions of the county boroughs named towards the cost of maintaining, repairing and enlarging the existing asylums, or either of them, and the repayment of existing or any future loans and pensions, and any other expenditure that they are at present liable to contribute to, be based upon the daily average number of inmates in the two asylums from each of the boroughs named in proportion as those numbers respectively bear to the total daily average number of inmates in the asylums, for which the county is legally liable to provide accommodation; (b) that the county boroughs named, or either of them, shall not terminate the agreement without the consent

of the County Council, whilst any monies borrowed by the County Council for the purpose of providing asylum accommodation are due and owing; (c) that the representation of the county boroughs named upon the committees of visitors of each asylum, and which for the purpose of such representation shall be taken as one, be in proportion to their contribution, and such representation shall be divided by the county boroughs upon the committees of visitors of each asylum as they may, with the approval of the Council, mutually arrange. 2. That the asylums extension committee be, and they are hereby reappointed, and authorised to complete the negotiations with the county boroughs of Birkenhead and Stockport, and that the common seal of the Council be affixed to any agreement or agreements with such boroughs that may be recommended by the committee. 3. That, having regard to the fact that the county boroughs of Birkenhead and Stockport, and also the Council, have already concurred in the proposal to enlarge the asylum at Upton, the increased accommodation which is at present urgently required for the pauper lunatics of the county be provided by enlarging that asylum, so as to accommodate 416 additional patients. 4. That the plans prepared by Messrs. Grayson & Ould for enlarging the asylum at Upton to accommodate 416 additional patients, and which plans have been approved by the Commissioners in Lunacy and the Secretary of State, together with the following estimates submitted by the architect for carrying out such plans, be adopted:—New buildings, 62,400*l.*; warming and ventilating, 3,600*l.*; outfall drainage, 1,000*l.*; electric light for new building, 2,000*l.*; architect's commission and clerk of works, 3,200*l.*; furnishing 4,000*l.*; total, 76,200*l.* 5. That the plans prepared by the county surveyor for the new farm buildings for the asylum at Upton, together with his estimate of 2,650*l.* for carrying out such plans, be adopted. 6. That upon the agreement with the county boroughs of Birkenhead and Stockport being completed, an estimate of 80,000*l.* be formally submitted to the finance committee as the probable amount that will be required to carry out the work shown upon the plans prepared by Messrs. Grayson & Ould and the county surveyor. 7. That upon the agreement with the county boroughs of Birkenhead and Stockport being completed, the clerk be authorised to make application to the Local Government Board for permission to borrow 80,000*l.* on the security of the county fund and of any revenues thereof, and that, inasmuch as the providing of additional asylum accommodation is one of

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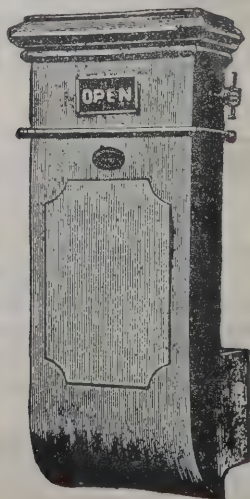
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great urgency, the chairman and vice-chairman of the Council, the chairman of the Upton Asylum Committee of Visitors, and the chairman of the Asylums Extension Committee be authorised to interview the officials of the Local Government Board, with the object of expediting the holding of any local inquiry which the Board may consider necessary to hold, and if necessary to obtain the sanction of the Board to the work being commenced prior to their sanction to borrowing the amount named being given. 8. That upon the sanction of the Local Government Board being obtained to the borrowing of the 80,000*l.* before mentioned, the finance committee be authorised to borrow such amount by county stock or otherwise, in such sums and at such times as they may consider necessary, for the purpose of meeting the instalments that may be payable upon any contracts that may be entered into for carrying out the works before mentioned. 9. That upon the sanction of the Local Government Board being obtained for the borrowing of 80,000*l.* before mentioned for enlarging the asylum at Upton, to accommodate 416 additional patients, the visitors of the Upton Asylum be, and they are hereby authorised to advertise for, and accept in the name of this Council, contracts for the enlargement of such asylum in accordance with the plans prepared by Messrs. Grayson & Ould and the country surveyor, and also to appoint a clerk of the works to superintend the erection of the same, reporting to this Council the names of the persons whose contracts they accept, and the amounts thereof, and also the person appointed as such clerk of works, and further submit to each quarterly meeting of this Council reports as to the progress of the works. (10) That the common seal of this Council be affixed to any contracts accepted by the committee of visitors of the Upton asylum for the enlargement of the asylum at a cost not exceeding 80,000*l.*, and also to any mortgage not exceeding that amount that may be arranged by the finance committee.

RANGOON IRONWOOD.

THE Agent-General for the British Colony of Tasmania is instrumental in sending hardwood blocks for paving our roadways. This is just as it should be. We have had enough of the soft wood from the Baltic district, where, by-the-by, we pay heavy duties for every item of goods we send into the district. There is yet another Anglicised colony whence we may derive

a suitable road-paving, and that is the "pinko," or ironwood, of Rangoon, which is very solid and hard, and is considered to be equal in wearing capacity to the noisy granite blocks with which many of our streets are yet paved.

The recent rains have protected the eyes from the filthy accumulation of London dirt called dust, and now that fine weather is upon us, we shall doubtless suffer from inefficient street cleansing. It would be valuable to know how many London pedestrians have contracted affections of the eyes from the so-called dust. Not only the eyes but the lungs of the London visitors are affected, yet nothing is done to prevent the nuisance, save perhaps in the little Strand district, where Surveyor Ventris hoses down the streets with water from the mains in spite of the feelings of that excellent body the London County Council. The proper cleansing of the streets as carried out in Covent Garden district, whereby the street filth is driven direct into the sewers instead of into the eyes and lungs of the public, suggests a large subject—the cleansing of the streets in the hands of the district surveyor, and the underground sewer in those of the London County Council. It remains for the latter power to drive the material to the outfall; this can be done by a proper hydraulic flushing system, which, however, is not yet in vogue in London, where the authorities might take a lesson from Liverpool, where the system has been given a trial with great success.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THIS Society has just paid a visit to the works of the Linde British Refrigeration Company at Shadwell. The members were shown over them by Mr. C. W. Vollmann, chief engineer of the company. The visitors were conducted to the engine-room, where the process was described, and were shown some excellent engines, pumps and other machinery. They were then conducted to the floor above, where were seen the methods adopted for cooling the ammonia which was used in the Linde process and new evaporative surface-condensers. Members were then taken to the ice-making rooms, where they were shown a very complete plant. The ice, which is made from filtered water, is formed in the shape of square truncated pyramids; the moulds are of wrought-iron. These moulds are arranged in rows, and are attached to frames which are raised by means of an overhead traveller when required. The moulds are filled by means of curved tubes, which are connected to a

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horizontal tube capable of being turned, and is turned, so that the ends of the curved tubes are lowered to the bottom of the moulds, and as soon as these ends reach this position a valve is opened in each bent tube, and the water flows into the moulds with the smallest possible admixture of air. When the filling is done the curved pipes are withdrawn, and the moulds being immersed in a brine freezing mixture, freezing commences. The row of moulds furthest from the filling tubes, having been emptied of the ice-blocks that are in it, is brought back to the filling end. The newly-filled moulds having been pushed forward, the fresh set of moulds takes the place of the former, and so on continuously. Large quantities of the ice made is used by the fishing-boats that attend the adjacent market, the ice being specially crushed for them. The method of crushing was shown, as was also the arrangement made for specially delivering the crushed ice to the boats. The cold store was next inspected, and those present then proceeded to an adjoining room, where refreshment was provided through the hospitality of the company. A hearty vote of thanks was passed to Mr. C. W. Vollmann as the company's representative, and to Mr. C. W. Vollmann himself, for the kindness shown to all present. Mr. G. W. Willcocks, M.I.C.E., having proposed, and Mr. E. H. G. Brewster, M.I.M.E. & Co., having seconded the proposal, and the members having bid good-day to Mr. C. W. Vollmann, they proceeded to Blackwall, where they inspected, through the courtesy of Mr. A. R. Binnie, the chief engineer to the London County Council, the works of the Blackwall Tunnel now in course of construction.

COST OF LONDON IMPROVEMENTS.

A RETURN issued by the works committee of the London County Council shows the scope and cost of recent operations conducted by that body throughout the metropolis. From May, 1893, to March last the total outlay on completed works was 21,156*l.* 16*s.*, being a saving of fully 2,000*l.* on the estimates. The undertakings finished, but for which the accounts have not yet been returned, represent a probable expenditure of 43,235*l.* 13*s.* 11*d.*, while the sum of 1,120*l.* has been disbursed on smaller works. Costly as these schemes of the Council are, they are dwarfed by the still more extensive enterprises in progress or about to be commenced, the latter being estimated at 82,738*l.*, while 177,445*l.* is given as the likely charge for the

former. The public health and housing committee is responsible for the heaviest of these items—that known as the Boundary Street Improvement scheme—which is estimated to cost 44,200*l.*; while the main drainage committee is second with 30,000*l.* for the extension of the Fleet storm relief sewer.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

12263. Jeshurun Coulthurst, for "Improvements in socketted earthenware drain-pipes."

12319. James Evans, Charles Harris and Thomas Francis Evans, for "Improvements in ventilating apparatus."

12354. Rowland Hodges and Samuel Hill, for "Improvements in fastenings for fanlights and for like purposes."

12376. George Thomas Lester, for "An improvement in sash-fasteners."

12457. Benjamin William Heymanson, for "Bottom bolt spring socket for folding doors."

12614. Alfred Dyson, for "Improvements in and connected with water-closets."

12636. Alexander Marshall, for "Improvements in ventilators and chimney-cans."

12683. Arthur Lawrence Rock, for "An improved liquid seal valve for controlling the passage of gas and air to and from hearths."

12738. Walter Flitcroft, for "Improvements in or relating to sliding and swiveling windows."

12748. William Newbigging, for "Improvements in mounting electric and other lamps."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERGAVERNNY.—July 25.—For Building Schoolroom at Congregational Church. Rev. T. Bowen, Castle Street, Abergaurnny.

ALNWICK.—July 28.—For Building St. James's Presbyterian Church. Mr. W. Lister Newcombe, Architect, 89 Pilgrim Street, Newcastle-on-Tyne.

ASHBOURN.—For Building Methodist Chapel and School. Mr. Henry Harper, Architect, Market Place, Nottingham.

ASHFORD.—July 27.—For External Iron Staircases. Mr. C. D. Hume, Clerk to the Managers of the West London School District, Ashford, near Staines.

AYLESBURY.—July 28.—For Building Public Baths. Mr. George Fell, Clerk, 2 Rickford's Hill, Aylesbury.

BATH.—July 27.—For Vapour Baths in connection with the King's Baths Establishment. Mr. A. Amor, Octagon Chambers, Milsom Street, Bath.

BEDMINSTER.—July 30.—For Building Board School. Mr. Edward Gabriel, Lucas Hall Chambers, Baldwin Street, Bristol.

BELFAST.—July 30.—For Building Chimney, Claredon Graving Docks Yard. Mr. G. F. L. Giles, Harbour Engineer, Belfast.

BILLINGBOROUGH.—For Additions to School Board Buildings. Mr. Herbert Kirk, County Surveyor's Office, Sleaford.

BIRKENHEAD.—July 31.—For Building Workshops at Workhouse, Tranmere. Mr. J. C. Ogle, Architect, 34A Hamilton Square, Birkenhead.

BISHOP'S WALTHAM.—July 25.—For Additions to Board School. Mr. Francis Clark, Clerk to the Board, Bishop's Waltham.

BOSSINGTON.—July 21.—For Building Chapel. Messrs. Foster & Wood, 35 Park Street, Bristol.

BRADFORD.—July 25.—For Building Carpet-beating Works. Messrs. Rycroft & Firth, Architects, Bank Buildings, Manchester Road, Bradford.

BRISTOL.—For Additions to Schools, Newton Street, Loe. Mr. J. Ace Beynon, Architect, Coleford, near Bath.

CARLISLE.—July 25.—For Additions to South Vale Works. Messrs. Johnstone Bros., Architects, 39 Lowther Street, Carlisle.

CHERTSEY.—July 25.—For Construction of Landing Stage at Bridge. Mr. H. E. Paine, Guildford Street, Chertsey.

CHRISTCHURCH.—Aug. 25.—For Adding Block to Men's Quarters at the Workhouse. Mr. E. H. Burton, Architect, Bournemouth.

CHRISTCHURCH.—Aug. 25.—For Building Cottage Homes and Schools. Mr. A. Druitt, Clerk to the Board of Guardians. Mr. E. H. Burton, Architect, Bournemouth.

COOMBE.—For Building Chapel. Mr. Alfred C. Bothams, Architect, 39 Castle Street, Salisbury.

CRICKLADE.—July 25.—For Rebuilding Sunday School. Mr. James Wilkins, High Street, Cricklade.

DRIGG.—July 27.—For Improvements to Farmhouse and Buildings. Mr. William Hodgkin, Drigg, Cumberland.

EAST BARNET.—July 27.—For Building Four Pairs of Cottages. Mr. W. Jackson, 1 St. Wilfrid's Road, New Barnet.

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EGREMONT.—July 23.—For Building Boundary Wall, Exhauster and Pump-house, Mortar-mill, Shed and Lime Stores. Mr. H. Ashton Hill, Engineer, Gasworks, Great Float, Birkenhead.

EMSWORTH.—July 27.—For Alterations to National Schools. Mr. H. A. Dixon, Architect, Emsworth, Hants.

GATESHEAD.—July 25.—For Additions to Refreshment Room, Town Hall. Mr. J. Bower, Borough Engineer.

GAYWOOD.—July 26.—For Building Villa, &c. Mr. E. J. Colman, Architect, Market Place, King's Lynn.

GLENKINDIE.—July 24.—For Dwelling-house, &c. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

GRANGE-IN-BORROWDALE.—July 21.—For Building School. Rev. A. J. Heelis, Borrowdale Vicarage.

HETHERSGILL.—July 20.—For Additions to School. Mr. Leslie, 11 Broad Street, Carlisle.

INCE.—July 24.—New Railway Station. The Engineer, Hunt's Bank, Manchester.

INDIA.—July 24.—For Construction of Settling Tanks, Filter Beds, Elevated Reservoirs, Supplying and Laying Pipes, &c.; Supplying Pumping Engines. This Tender must be accompanied by Drawings and Specifications of the Engines and Pumps, and the makers' names must be given. There will be no objection to the name of more than one maker being mentioned. At Howrah, in the Bengal Presidency. Messrs. Grindlay & Co., 55 Parliament Street, S.W.

KEIGHLEY.—July 20.—For Building Chapel and Sunday School. Messrs. Bailey, Architects, 9 Market Street, Bradford.

KENDAL.—For Enlarging British Schools. Mr. Stephen Shaw, Architect, Kendal.

KNOWLE.—July 25.—For Six Sanitary Spurs at County Asylum. Mr. James Robinson, County Architect, 13 Southgate Street, Winchester.

LAMBORNE.—July 24.—For Additions to National Schools. Mr. Reginald L. Barnes, Clerk to the Managers, Lamborne.

LEE.—Aug. 2.—For Erection of Nineteen Shops. Messrs. F. & W. Stocker, 90 Queen Street, E.C.

LOUGHLINSTOWN.—July 25.—For Alterations at Work-house for Protection from Fire. Mr. F. C. Caldbeck, Engineer, 2 St. Andrew Street, Dublin.

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MANCHESTER.—July 23.—For Building Brick Arches, Bradford Road Gas Station. Mr. C. Nickson, Town Hall, Manchester.

MERTHYR TYDFIL.—Aug. 1.—For Building Board School, &c. Mr. E. H. Lingen Barker, Architect, 146 St. Owen Street, Hereford.

NEWCASTLE.—July 25.—For Construction of Passenger Stations, Felling and Pelaw. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

NEW HINKSEY.—July 25.—For Additions to Schools. Mr. Curry, The Vicarage, New Hinksey, Oxford.

NEW HIRST.—For Building Mechanics' Institute. The Secretary, Colliery Office, Ashington.

NEW TREDEGAR.—For Building Twelve Cottages. Mr. J. H. Phillips, Powell Duffryn Offices, New Tredegar.

NORTH MOLTON.—For Additions to Schools. Mr. Frederick Dobbs, North Molton.

OXFORD.—July 28.—For Building Corn Exchange, Fire Brigade Station, &c. Mr. H. W. Moore, Architect, 6 Beaumont Street, Oxford.

PEMBROKE.—July 30.—For Additions to Schools. Mr. John E. P. Ladd, Architect, Main Street, Pembroke.

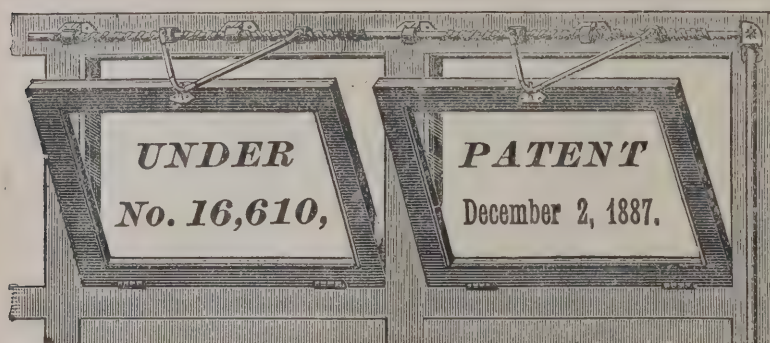
PONTYPRIDD.—July 26.—For Building Business Premises and Offices. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

ROCHESTER.—July 24.—For Building Factory. Mr. W. Banks, 5 Theobald Square, Rochester.

ROCHESTER.—Aug. 1.—For Building Six Cottages. Mr. W. Banks, Guildhall, Rochester.

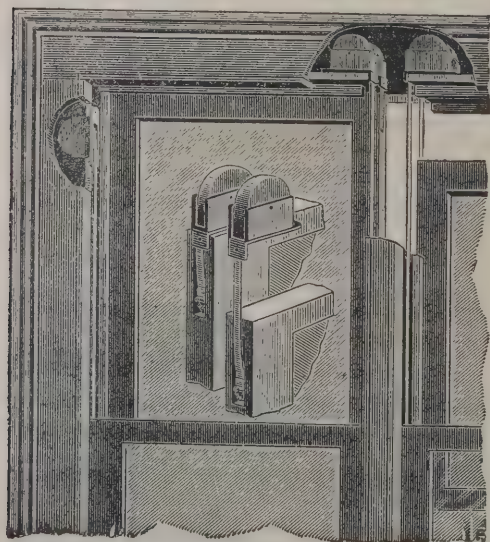
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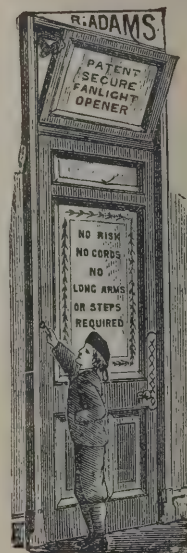
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SOUTHAMPTON.—July 27.—For Two Underground Conveniences, Blue Brick Paving, Channelling Works, &c. Mr. W. B. G. Bennett, Borough Surveyor, Southampton.

STAPLETON.—July 26.—For Building Board School. Mr. H. M. C. Hurst, Architect, Broad Street, Bristol.

TOTTENHAM.—July 24.—For Erection of 160 Feet of Fence Wall at the North-Eastern Hospital. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

TREHARRIS.—Aug. 17.—For Additions to Board School. Mr. John Williams, Architect, Morgantown, Merthyr Tydfil.

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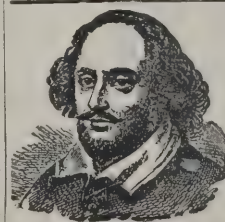
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J. Willmott & Son, Hitchin	605	0	0
N. Lidstone, Blackstock Road	576	0	0
W. Pavey, Winchmore Hill	568	0	0
L. F. Halliday, Stamford	499	10	0

BARNESLEY.

For Construction of Fence Wall and Wrought-iron Railings and Gates at the Junction of Sheffield Road and Doncaster Road, for the Barnsley Town Council. Mr. J. HENRY TAYLOR, Borough Surveyor.

Accepted Tenders.

Doulton & Co., London, urinals and terra-cotta work	£126	8	3
Mellor & Moorhouse, Barnsley, mason	125	0	0
E. J. Raybould & Co., Workington, ironfounder and smith.	82	9	4

For Paving, Flagging, &c., Brinckman Street, Barnsley. Mr. J. HENRY TAYLOR, Borough Surveyor.

Duncan & Jones, Stairfoot	£1,130	0	0
T. Taylor, Barnsley	936	0	0
H. Burrows & Son, Barnsley	888	12	0
J. Cooper, Barnsley	888	7	3
J. HOOD, Barnsley (accepted)	866	3	6

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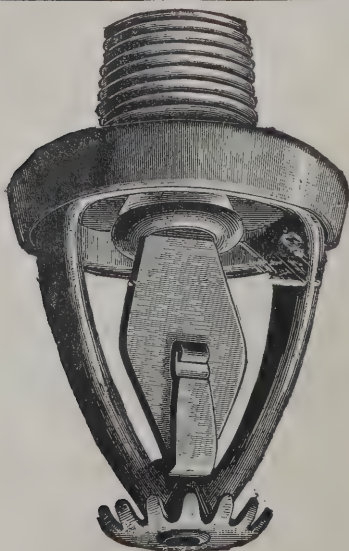
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BRADFIELD.

For Construction of Reservoir at Bradfield, Essex, for the Tending Hundred Water Company. Mr. P. GRIFFITHS, Engineer. Quantities by Messrs. PRYCE, CUXON & LEIGH.

Reservoir to hold 300,000 Gallons.

H. Plummer, Rattlesden	£1,961	0	0
S. Parmenter, Bocking	1,810	0	0
J. Pickthall & Son, Harlesden	1,774	1	7
W. Coker, Halling	1,771	9	8
G. Double, Ipswich	1,718	0	0
E. Saunders, Dovercourt	1,543	0	0
Girling & Coe, Ipswich	1,497	0	0

Reservoir to hold 200,000 Gallons.

H. Plummer	1,477	0	0
S. Parmenter	1,352	0	0
J. Pickthall & Son	1,333	8	3
W. Coker	1,341	18	10
G. Double	1,320	0	0
E. Saunders	1,148	0	0
Girling & Coe	1,137	0	0

BRISTOL.

For Alterations to Nos. 41, 42 and 43 College Green, Bristol, for Messrs. Jolly & Son. Mr. R. MILVERTON DRAKE, Architect, Bristol.

COWLIN & SON (accepted) £1,500 0 0

BROCKLEY.

For Erecting and Completing the Boundary Wall of the Brockley Cemetery, for the St. Paul's Deptford Burial Board. Mr. JOHN JAMES DOWNES, Architect, 11 The Parade, Lewisham High Road.

Oldman, Deptford	£298	0	0	A.
Frampton, Deptford	274	0	0	15s. 0d.
Holloway, Deptford	270	0	0	16s. 6d.
Soper, Deptford	259	16	6	15s. 6d.
Ling, Deptford	252	0	0	—
Schofield, Deptford	240	0	0	14s. 4d.
Hubble, Deptford	240	0	0	14s. 0d.
JOHNSON, Deptford (accepted)	238	0	0	13s. 6d.

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BROOMHAUGH.

For Two Residential Houses at Broomhaugh, Riding Mill, Northumberland, for Mr. J. W. Fair, Haigh Hall, Wigan.

M. Robson, Corbridge-on-Tyne	£1,540	17	8
R. Wood, Blaydon-on-Tyne	1,400	0	0
A. Mather, Newcastle	1,370	8	6
WEDDLE BROS., South Benwell (accepted)	1,309	13	5

BUCKHURST HILL.

For Building Two Cottages at Buckhurst Hill, for Mr. John Appleby. Mr. E. BROWN, Architect, Fleur-de-Lys Street, Norton Folgate.

J. V. Kiddle & Son	£515	0	0
S. Salt	471	0	0
W. Wells	450	0	0
A. H. Arber	399	0	0
D. Cannon	357	0	0
W. Daniels	225	0	0

BURY ST. EDMUNDS.

For Erection and Completion of First Block of Farm Buildings, including Dwelling-house, Dairy, &c., for Mr. John Lysaght, Hengrave, Bury St. Edmunds, Suffolk. Mr. R. MILVERTON DRAKE, Architect, 24 College Green, Bristol.

Everett & Sons, Colchester	£2,997	0	0
Shillitoe & Son, Bury St. Edmunds	2,990	0	0
Grimwood & Son, Sudbury	2,870	0	0
Linzell, Newmarket	2,697	0	0
Girling & Coe, Ipswich	2,647	0	0

For Erecting a Laundry, for Mr. John Lysaght, Hengrave, Bury St. Edmunds, Suffolk. Mr. R. MILVERTON DRAKE, Architect, 24 College Green, Bristol.

H. J. Linzell, Newmarket, building	£559	0	0
Manlove, Alliot & Co., Limited, Nottingham, machinery	207	0	0

CARRICKFERGUS.

For Repair of Road from Carrickfergus to Larne, between Woodburn Bridge and the Copeland Water.

J. K. McAllister	£150	0	0
J. PICKEN (accepted)	146	10	0

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COMPTON GIFFORD.

For Tar-paving Footway in the Tavistock Road, for the Compton Gifford Local Board. Mr. R. M. WORTH, Surveyor, George Street, Plymouth.

Wainwright & Co., Shepton Mallet	£347	9	2
J. Straddock, Plymouth	329	17	4
C. J. Duke, Plymouth	291	16	10
PAYNTER & DAVY, Plymouth (accepted)	279	18	8
Surveyor's estimate	325	0	0

CORK.

For Building Five Houses, Belgrave Avenue, off Sidney Place, Cork, for Mr. Alfred M. Cole, 75 Patrick Street, Cork. Mr. JAMES F. M'MULLEN, Architect, 30 South Wall, Cork.

D. DUGGAN (accepted) £950 0 0

For Alterations and Additions to Goods Stores of the City of Cork Steam Packet Company, Limited, Penrose Quay. Mr. JAMES F. M'MULLEN, Architect, 30 South Wall, Cork.

C. MULLANY (accepted) £1,115 0 0

CUBERT.

For Erection of Board School at Cubert, for the Cubert School Board. Mr. SAMPSON HILL, Architect, Redruth.

James Julian, Truro £743 0 0

THOMAS RODLIFF, Cubert (accepted) 628 0 0

EASTLEIGH.

For Engine and Boiler-house, Chimney Shaft and Engine Driver's Cottage, for the Eastleigh Local Board. Mr. H. J. WESTON, Engineer, 20 Portland Street, Southampton.

Playfair & Toole, Southampton £926 0 0

H. W. Bull, Southampton 897 0 0

J. Treherne, Eastleigh 816 0 0

BEALE, Eastleigh (accepted) 779 10 0

EGHAM.

For the Construction of about 730 Yards of Roads in Egham, close to the Station. Mr. L. A. LAYTON, Egham, Surveyor.

F. Talbot, Caversham Wharf, Reading £503 0 0

D. H. Porter, Queen Victoria Street, E.C. 470 0 0

J. W. Oades, Egham 448 19 0

Free & Sons, Maidenhead 399 0 0

G. I. WALKER, Sunninghill (accepted) 370 0 0

HASTINGS.

For Building Police and Fire Station at Bohemia, Hastings.

Barter & Gasson	£2,413	14	7
J. & P. Phillips	2,198	0	0
P. Peters	2,140	0	0
Longley & Co.	2,095	0	0
A. H. White	2,094	0	0
Chapman & Cuff	2,010	0	0
W. Ashdown	1,812	13	0
H. E. Cruttenden	1,797	0	0
Weathersee	1,749	0	0
S. W. Gammon	1,663	0	0

J. GEARY, 21 Horntye Road, St. Leonards (accepted) 1,555 0 0

For Building Police and Fire Station at Clive Vale, Hastings.

W. Small	£3,324	0	0
Barter & Gasson	2,593	8	6
H. Ditch	2,530	7	0
Longley & Co.	2,486	0	0
B. Peters	2,458	0	0
M. Funnell	2,386	13	0
D. H. Snow	2,269	0	0
Harman	2,200	0	0
A. H. White	2,100	0	0
W. Robinson	2,080	0	0
Midmer Bros.	1,950	0	0

S. W. GAMMON, 67 St. Thomas's Road, Hastings 1,867 0 0

HORNCHURCH.

For Building Cottage Homes, Construction of Road and Sewer, at Homes, Hornchurch, near Romford, for the Guardians of St. Leonard, Shoreditch. Mr. F. J. SMITH, F.R.I.B.A., Architect, 17B Great George Street, Westminster.

H. R. RONS, London Road, Grays (accepted) £6,730 0 0

ILFORD.

For Paving with Indurated Slabs and Kerbing the Path on the East Side of Green Lanes, from High Road to Stanley Road, for the Ilford Local Board. Mr. T. B. BALDWIN, Surveyor.

W. Wady £176 10 2

R. Stroud, Ilford 161 19 0

W. GRIFFITHS, London (accepted) 157 4 9

Surveyor's estimate 160 0 0

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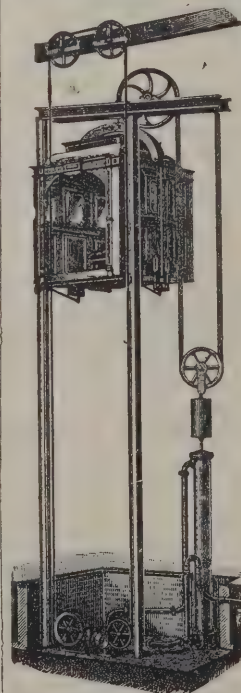
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Building Branch Public Library, on the Beverley Road, for the Corporation.
BOWMAN & SONS, Stamford (accepted) . . . £1,984 0 0
KILNHURST.
Alterations and Additions to the Kilnhurst Board Schools, for the Swinton School Board. Mr. H. L. TACON, Architect, 11 Westgate, Rotherham.
E. J. Bower, Swinton . . . £573 0 0
G. Pugh, Rawmarsh . . . 571 0 0
J. Tradewell, Rawmarsh . . . 565 10 0
A. T. Ripley, Rotherham . . . 540 0 0
CHADWICK & CO., Rotherham (accepted) . . . 531 10 0

LEAMINGTON.

Building Boys' School, School of Cookery, and Manual Training School in Leicester Street, Leamington, Alteration of Slope to Playground, and Out-offices, Leicester Street Girls' and Infants' Schools, for the School Board. Mr. F. FOSTER, Architect, 4 Euston Place, Leamington.
Kimberley, Banbury . . . £6,806 0 0
G. Hill, Coventry . . . 6,106 0 0
A. A. Wincott, Coventry . . . 6,071 0 0
T. Bailey, Leamington Spa . . . 5,945 14 0
R. Bowen, Leamington Spa . . . 5,815 0 0
G. F. SMITH & SONS, Milverton (accepted) . . . 5,770 0 0
Architect's estimate . . . 5,850 0 0
Construction at Turkish Bath of Steam Heating Apparatus, containing about 600 Feet of 4-inch Cast-iron Pipe, with Bends, Tees, Valves, Steam-traps, &c., for the Corporation.
Griffin Foundry Company, Birmingham . . . £232 10 0
J. Hands & Sons, Birmingham . . . 190 0 0
Jenkins & Sons, Leamington . . . 188 0 0
E. M. Mitton, Birmingham . . . 165 9 9
Coventry Gas Fittings Company, Coventry (accepted) . . . 125 0 0

LONDON.

Building White's Row, Spitalfields, for Mr. Abbott. Mr. F. WALLEN, Architect.
Titmas & Son . . . £2,445 0 0
Burman & Son . . . 2,425 0 0
L. H. & R. Roberts . . . 2,278 0 0
Holloway . . . 2,190 0 0
Macfarlane Bros. . . 2,087 0 0
H. G. DAVENALL, Southampton Works, Gospel Oak (accepted) . . . 1,937 0 0

LONDON—continued.

For Painting and Decorating Board-room, &c., for the South Hornsey Local Board. Mr. W. M. JAMESON, Surveyor.
Goodall & Son, Dynevor Road . . . £170 0 0
Coates, Peckham, S.E. . . . 150 0 0
Bradford, Balls Pond . . . 129 0 0
Burton & Son, Cowper Road . . . 105 0 0
Thompson, Matthias Road, N. . . . 99 0 0
Britton, Leconfield Road . . . 96 14 6
Bax & Clarke, Mountgrove Road . . . 83 10 0
BALDWIN, Kingsland High Street (accepted) . . . 71 0 0
For the Erection of the Clapham Common Branch of the London and South-Western Bank, for the Directors. Mr. E. GABRIEL, Architect, 42 Old Broad Street, E.C. Quantities by Messrs. G. R. TASKER & SONS, 38 John Street, Bedford Row, W.C.
W. A. Prior . . . £6,350 0 0
Garrett & Sons . . . 6,325 0 0
F. & H. F. Higgs . . . 6,296 0 0
Scharien & Co. . . . 6,296 0 0
Gould & Brand . . . 6,292 0 0
Smith & Sons . . . 6,275 0 0
J. Carmichael . . . 6,118 0 0
Tennant & Co. . . . 6,094 0 0
Young & Lonsdale . . . 6,071 0 0
Godson & Sons . . . 5,956 0 0
W. Shepherd . . . 5,948 0 0
For Erection of Three Shops in High Street, Clapham, S.W., for Mr. S. G. Budd. Mr. E. GABRIEL, Architect, 42 Old Broad Street, E.C. Quantities by Messrs. G. R. TASKER & SONS, 38 John Street, Bedford Row, W.C.
Scharien & Co. . . . £5,056 0 0
Tennant & Co. . . . 4,962 0 0
Smith & Sons . . . 4,905 0 0
Gould & Brand . . . 4,814 0 0
Godson & Sons . . . 4,807 0 0
Garrett & Co. . . . 4,800 0 0
W. A. Prior . . . 4,700 0 0
F. & H. F. Higgs . . . 4,680 0 0
J. Carmichael . . . 4,645 0 0
W. Shepherd . . . 4,619 0 0
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LONDON—continued.

For Alterations and Repairs to St. John's Church, Broad Court, Drury Lane, for the Vicar, Churchwardens and Church Council. Messrs. GORDON M. HILLS & SON, Architects. Quantities by Mr. CHARLES A. BASSETT SMITH.

Cornish & Gayner	£2,200	0	0
A. J. Hocking	2,030	0	0
S. Hunt	1,805	0	0
Dove Bros.	1,860	0	0
Norris & Sons	1,695	0	0
Howard & Co.	1,669	0	0

For the Enlargement of the Dining-hall at Cornwallis Road, Workhouse, Islington, for the Guardians of St. Mary, Islington. Mr. WILLIAM SMITH, A.R.I.B.A., Architect, 65 Chancery Lane.

Eddie	£1,127	0	0
Goodman	1,093	0	0
Lorne & Son	990	0	0
Stevens Bros.	960	0	0
Sheffield Bros.	946	0	0
Wells	931	0	0
England & Yale	916	0	0
Lidstone	865	0	0
Peck	839	0	0
Willmott	836	0	0

For Erection of Corset and Perfumery Factories (Crown Perfumery Co.), and Premises in Sidney Road, Homerton, for Messrs. W. S. Thomson & Co., Limited. Messrs. SHOE-BRIDGE & LEWIS, Architects, 163 Strand, W.C.

Perry & Co.	£12,141	0	0
Holloway Bros.	11,900	0	0
T. Boyce	11,838	0	0
Foster & Dicksee	11,750	0	0
Grover & Son	11,750	0	0
F. Higgs & Co.	11,500	0	0
Patman & Fotheringham	11,451	0	0
Braid & Co.	11,140	0	0
Harris & Wardrop	10,993	0	0
J. Anley	10,700	0	0
DEARING & SON (accepted)	10,500	0	0

LONDON—continued.

For the Proposed New Avenue now in course of Erection, for Mr. Joseph Carter Wood, on the Ancient Site in Westminster known as the Artillery Brewery. Mr. JOHN CALDER, Architect. Quantities by Mr. EDWARD CRUTCHLOE, Albert Chambers, Victoria Street, S.W.

Contract No. 2.

William King & Son* £10,146 0 0
* Accepted without competition at the schedule of prices upon which their accepted tender for Contract No. 1 was based.

LEDBURY.

For Building the Proposed Barrett-Browning Institute and Clock Tower, Ledbury. Mr. BRIGHTWEN BINYON, Architect, Ipswich.

David Smith, Ledbury	£2,331	10	0
Bowers & Co., Hereford	2,213	8	0
J. Edwards, Leominster	2,197	0	0
William Jones, Gloucester	2,195	0	0
J. Everal, Malvern	2,098	0	0
H. Smith, Kidderminster	2,044	0	0
GEORGE HILL, Ledbury (accepted)	1,862	14	6
Estimate (total)	2,300	0	0

NEWBURY.

For Construction of about 200 Lineal Yards of Brick Wall and Post and Iron Rail Fencing on the Pyle Hill Footway, for the Corporation. Mr. E. A. STICKLAND, Borough Surveyor.

T. Taylor, Newbury	£165	0	0
E. C. James, Newbury	142	0	0
J. Townsend, Speenhamland	127	7	9
A. J. CHEVIS, Newbury (accepted)	124	15	0

NORTHUMBERLAND HEATH.

For the Erection of Five Cottages at Northumberland Heath, Kent. Mr. C. L. MORGAN, Architect.

JOHN BRIDGE (accepted)	£600	0	0
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POOL.

For the Erection of Sunday School at Pool, for the United Methodist Free Church, Carnbrea, R.S.O. Mr. SAMPSON HILL, Architect, Redruth.

John Roberts, Pool	£226	0	0
J. Stoneman, Pool	220	0	0
A. Nicholls & Son, Redruth	208	0	0
ED. POOLEY, Pool (accepted)	196	0	0

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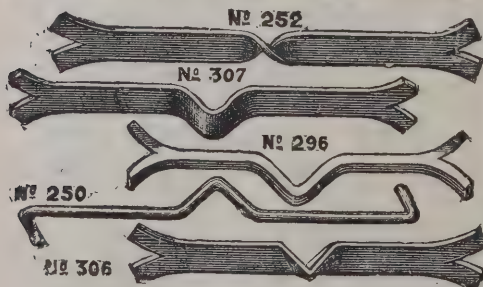
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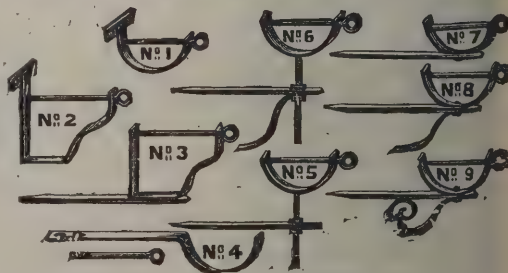
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Binns	£27,640	2	9
Chadwick & Co.	25,497	0	0
Snell	24,950	0	0
Pallinson & Co.	24,500	0	0
Ripley	23,750	0	0
Hodson	22,870	0	0
Warburton	22,800	0	0
Smith	22,534	0	0
Ives	22,400	0	0
Arnold	22,060	0	0

SWANSEA.

For Alterations and Rebuilding to 7 Temple Street, Swansea, for Messrs. B. Evans & Co. Messrs J. P. JONES, ROWLANDS & MARGRAVE, Architects, 58 Wind Street, Swansea.

D. C. Jones, Gloucester	£599	0	0
Lloyd Bros., Swansea	581	0	0
H. Billings, Swansea	520	0	0
J. D. Williams, Knighton	510	0	0
W. Knight, Swansea	507	0	0
GUSTAVUS BROS., Swansea (accepted)	461	13	9

SWINDON.

For Erecting a New Wing at the Swindon Victoria Hospital. Mr. W. H. READ, M.S.A., Architect, Corn Exchange, Swindon.

Flewelling, Wootton Bassett	£909	0	0
G. Wiltshire, Swindon	882	0	0
C. Williams, Swindon	830	17	0
J. Williams, Swindon	797	0	0
T. BARRETT, Swindon (accepted)	700	0	0
W. Chambers, Swindon	699	10	0
T. Colborne, Swindon	699	2	6

TUNSTALL.

For Building Schools, High Street, Tunstall, for the Wolstanton School Board. Mr. A. R. WOOD, Architect, Tunstall.

YORKE & GOODWIN (accepted)	£6,690	0	0
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TREALAW.

For Building Sixty Houses at Trealaw, for the Miskin Building Club. Mr. F. GIBSON, Architect, Midland Bank Buildings, Pontypridd.

J. C. Richards, Pontypridd	£175	0	0
W. Evans & Sons, Penygraig	167	0	0
C. Jenkins & Sons, Porth	166	0	0
Jones & Davies, Trealaw	156	0	0
J. Griffiths, Trealaw	154	10	0
J. James, Penygraig	153	16	8
Rowland & Lloyd, Penygraig	153	0	0
WILLIAMS & JAMES, Pontypridd (accepted)	149	10	0

WEST PINCHBECK.

For Alterations and Additions to West Pinchbeck School and to St. Matthew's School, Pode Hole.

J. Peake, Spalding	£1,040	0	0
A. T. Blood, Bourne	842	0	0
C. STEADMAN, Woodhall, near Horncastle (accepted)	215	7	0

WILMINGTON.

For New Classroom at Boys' School, Wilmington, near Dartford. Mr. G. H. TAIT, Architect.

G. Goodhead, Bexley	£573	0	0
J. Ellingham, Bexley Heath	463	0	0
J. G. Naylor & Son, Rochester	384	0	0
T. Martin, Dartford	375	0	0

WOODFORD.

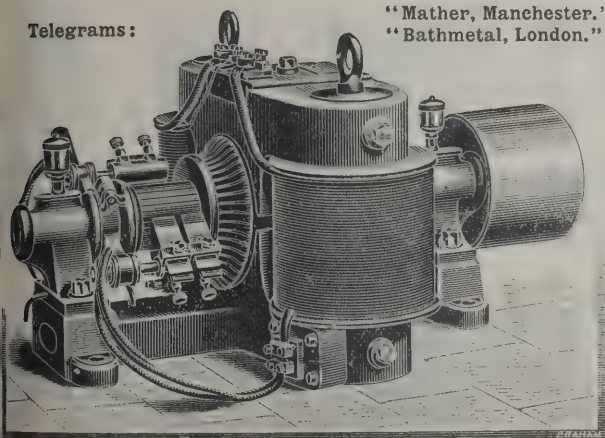
For Alterations and Additions to the Railway Tavern Public-house, for Mr. A. Bywater. Mr. EDWARD MONSON, jun., F.R.I.B.A., Architect, Acton Vale. Quantities supplied.

Dorey & Co., Brentford	£1,120	0	0
Atherton & Latta, Poplar	1,030	0	0
T. Nye, Ealing	1,006	0	0
Coulsell Bros., Bethnal Green	993	0	0
Welsh & Son, Canning Town	965	0	0

THE Brighton Board of Guardians have decided that a brass tablet be fixed in the new parochial offices commemorating their erection, with the names of the members of the present Board of Guardians engraved on it, an asterisk being placed against the names of the building committee.

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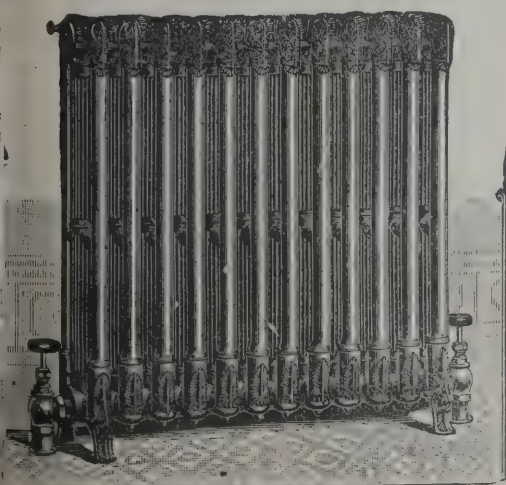
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BATTERSEA POLYTECHNIC.—UPPER HALL.

TRADE NOTES.

THE Western Schools, North Shields, for the Tynemouth School Board, are being warmed and ventilated throughout by means of Shorland's patent Manchester stoves and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester; the patent Manchester stoves previously supplied to these schools having proved very satisfactory.

A VERY large clock has just been erected at St. Thomas's Church, Stockport, as a memorial to the late Mr. Alderman William Smith. It has four illuminated dials, and strikes the hours and chimes the Cambridge quarters. The whole of the work has been carried out by John Smith & Sons, Midland Clock Works, Derby.

AT the meeting of the Gainsborough Local Board the tender of Sir H. Bacon to make up Stanley Street for 442*l.* was accepted. It was agreed that a portion of the market-yard should be used for overflow markets, half the takings to be paid as rent. Land for a new reservoir was also to be purchased for 500*l.*

THE committee appointed by the Lancashire Asylums Board to consider the estimates submitted for the new asylum at Winwick have recommended the acceptance of the design of Messrs. Henry Crisp & Oatley. The revised estimate is 247,446*l.*, the original estimate being 300,000*l.*

WE are pleased to note that Messrs. Clark, Bunnett & Co., Limited, have just erected a new hydraulic passenger lift for Mr. A. Simner at Grosvenor Mansions, Belgravia. The whole of the work was so satisfactorily carried out that this gentleman invited all the men who had been engaged upon fixing the work and the foremen of the various departments, numbering eighteen, and about forty friends, to a most sumptuous banquet at the Holborn Restaurant.

A NEW clock, striking the hours on the large bell, and showing the time on one large external dial facing the market-place, has been erected in the ancient parish church, All Saints, Kirby Moorside, by Messrs. W. Potts & Sons, clock manufacturers, Leeds, and Newcastle-on-Tyne, from instructions received from the committee, Mr. J. Frank acting as chairman, and Mr. Richard Jennings, jun., acting as secretary. The Right Hon. the Earl of Feversham, Duncombe Park, headed the subscriptions by a handsome donation. The clock is made from the designs and plans of the Right Hon. Lord Grimthorpe. Messrs. Potts are also making the large clocks for Newcastle Cathedral and Stanhope Parish Church, Wear-dale, county of Durham, and Rufforth Church, Yorkshire, the Sheffield new city hall, and the large clock for the tower of the Leeds new post office.

AT a special meeting of the Stockport Town Council held on Wednesday, four tenders were submitted for the carrying out of contract No. 3 of the extensive scheme of sewerage now in progress. The amounts varied from 20,360*l.* to 26,421*l.* The tender for the first-named sum, from Messrs. T. & W. Meadows, Heaton Norris, was accepted.

VARIETIES.

UPPER BAVARIA, including especially the country about Ebersberg and Schrobenhausen, has suffered, the Berlin correspondent of the *Standard* says, very severely from the terrible tornado of wind and rain which visited those districts on Saturday afternoon. The village of Forstinning was almost entirely destroyed by a whirlwind, eighty, or more than half of the hundred and fifty houses being blown down. In two other villages also many of the houses were destroyed. In another place the church steeple was levelled with the ground. Whole groups of trees were mown down like grass, and the harvest throughout the district has been practically annihilated. During an apparently harmless thunderstorm, a whirlwind of terrific violence suddenly arose, demolishing houses and breaking down or tearing up trees a metre to a metre and a half in diameter. In some places the streets are covered a metre deep with stones. The burial grounds are totally devastated. Large tracts of forest are levelled to the ground. While the storm raged trees were blown from five to six hundred metres through the air. The region affected is about fifteen English miles long and nearly two broad.

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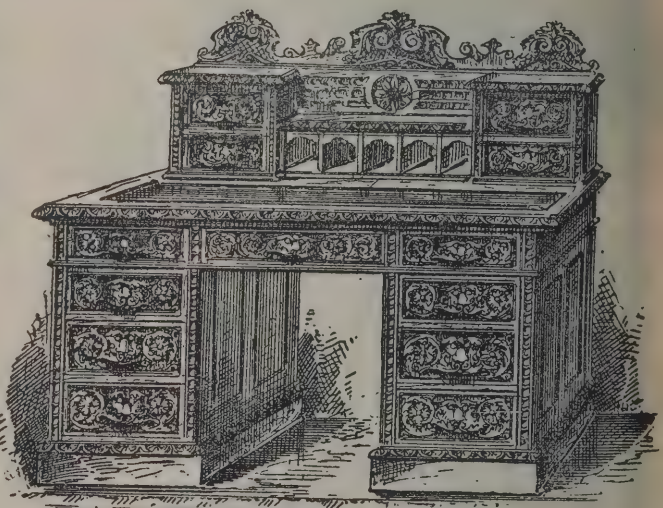
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440.—English Carved Oak Writing Table, Leather Top, on Casters, £15 10s.

Without Drawer and Pigeon-holes on Top, £10 10s.

DAMAGE to the amount of 10,000*l.* has been caused by a fire which occurred in a mill at Golcar, near Huddersfield, owned by Messrs. John Haigh & Sons, manufacturers.

THE Paddington Vestry have earnestly protested against the proposal of the School Board (accommodation committee) to erect a Board-school in South Paddington, at a cost which will probably reach 30,000*l.*, and entail an annual expenditure of 1,800*l.*, while there is already school accommodation in excess of the requirements of the population.

MR. H. GILBERT WHYATT, A.M.Inst.C.E., M.San.Inst., deputy borough engineer, Salford, has received an invitation to deliver a course of twenty evening lectures on sanitary engineering at Owens College during the coming winter. The lectures form a portion of the whole course in connection with the certificate of proficiency in hygiene and sanitary knowledge issued by the Victoria University to inspectors of nuisances.

THE laying of the line of mains, with service reservoir, required to enable the Darton Local Board to use water obtained from the well belonging to the Penistone Local Board, is now completed. The distance from the well to the reservoir is between nine and ten miles, and the pressure on the mains equals 425 feet head. The works are now being used. The contractors have now been settled with. The two contracts for iron pipes and general work amounted to 3,000*l.* 17*s.* 6*d.* and 2,150*l.* 15*s.* respectively, or a total of 5,150*l.* 12*s.* 6*d.* The actual cost of the works, after adding extras and making deductions, has been 2,707*l.* 15*s.* 1*d.* and 2,226*l.* 13*s.* 6*d.*, or a total of 4,934*l.* 8*s.* 7*d.* The works have therefore been carried out for 217*l.* 3*s.* 11*d.* less than the total contract amounts, and considerably below the engineer's estimate. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham.

THE Tooting Lodge Estate adjoining Tooting Bec Common has been acquired by the Metropolitan Asylums Board for the erection of an infirmary for 1,320 imbeciles of the metropolis.

At Spalding information has been received that boring operations at Deeping St. Nicholas, some five miles distant, which have been in progress for the past three months, have been successful, and that a splendid supply of water, about 40,000 gallons per day, is the result. The work has been carried out by the South Lincolnshire Fen Water Company, the contractor being Mr. Sykes, of Bankside, London. The bore extends to a depth of 285 feet, water being tapped in the limestone.

THE Holywell Local Board, being about to provide a water supply for the town, caused an analysis to be made of water from Llynhelig and St. Winifred's Well. The water of Llynhelig was pronounced unfit, but that of the well was highly commended, the analyst stating that for organic purity it was the finest sample he had ever met with.

THE Hanley Town Council have received a letter from the Local Government Board sanctioning a loan of 4,000*l.* for the electric wiring and fitting of the various municipal buildings.

THE *Nairnshire Telegraph* says that Hugh Leslie Mackenzie, aged thirteen, son of Mr. David Mackenzie, architect, Nairn, has won by competitive examination a foundation scholarship at Fettes College, Edinburgh, of the annual value of 130*l.*, including education and scholarship.

THE new casual wards for St. Saviour's Union, Southwark, erected at a cost of 9,000*l.*, but 200*l.* under the estimate—of which Messrs. Henry Jarvis & Son are the architects—are now completed and ready for occupation. A deputation of members from the St. Pancras guardians, who have viewed them, have intimated that they will advise their Board to copy.

THE Marylebone Vestry have voted their Baths Commissioners 42,000*l.* to reconstruct and enlarge the present bath and washhouse buildings in Lisson Grove.

CONTINENTAL PASSENGER TRAFFIC.

THE success of the Great Eastern Railway Company in their continental department was further proved during the week, when the fourth vessel built by Earle's Shipbuilding Company for the service was successfully launched at Hull, the christening ceremony being performed by Lady Frederick Seager Hunt. The vessel, named the *Vienna*, is a steel twin-screw steamer 302 feet long, 36 feet beam and 16 feet depth of hold. She with her sister vessels, the *Amsterdam* and *Berlin* (which were placed on the Hook of Holland route in May last) are the three largest vessels running a daily service between England and the Continent. The *Vienna* is fitted with two entirely separate sets of triple compound engines, designed to develop 5,000 horse-power, giving a speed of 18 knots an hour. Her fittings will be of the most luxurious description, including the electric light and all the most recent improvements. Sleeping accommodation will be provided for over 200 first-class passengers.



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4. The Draining Mill.	" 11. Byland Abbey.	" 18. The Interior of Norwich Cathedral.
5. On the Greta.	" 12. Norwich, from the Cromer Road.	" 19. Mountain Pass in the Tyrol.
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METROPOLITAN ASYLUMS BOARD.

MESSRS. A. & C. HARSTON, 15 Leadenhall Street, were, without competition, on the recommendation of the committee, appointed architects for the imbecile infirmary, to accommodate 1,320 patients, which it is proposed to erect on the Tooting Lodge estate, adjoining Tooting Bec Common. It was also agreed to adopt the plans prepared by Messrs. Pennington & Son, architects, for the erection of five two-storeyed pavilions for fever and diphtheria patients, and one block for isolation cases at the North-Western Hospital. These six pavilions, which will accommodate 226 patients at a cost of 43,500*l.*, will take the place of the existing temporary wards erected nearly twenty-five years ago, and now in a very dilapidated condition. The construction of the fifth or lowest ward will be deferred pending the settlement of the plans for the proposed ambulance station adjoining the hospital.

FOLDING PARTITIONS.

WE have previously called our readers' attention to the excellent folding partitions manufactured by Messrs. Peace & Norquoy, of Port Street, Manchester. These partitions were actually designed to meet the greatly increasing demand for a reliable and simple system of dividing one room from another by means of a moveable partition. It may be mentioned that the design of moveable partitions is not so easy as it would be thought at the first blush. The ideas and requirements of Government inspectors and insurance companies have to be met to a nicety, and Messrs. Peace & Norquoy have been successful in suiting not only the requirements of these officials and companies, but they have succeeded in meeting the convenience of those who have actually to use them, and it is considered that this important invention supersedes all other methods for dividing and subdividing rooms. By it a large hall can be divided, or the partition, by an easy gliding motion, folded back against the wall in two minutes without leaving any obstruction on the floor. These partitions have been approved and specified by architects in the erection of new schools and adopted by various school boards.

Messrs. Peace & Norquoy have been fixing six of their patent improved folding partitions in Coleman Street Ward Schools, London, under the superintendence of Mr. Martin L. Saunders, architect, London; they have also been adopted in Grove House School, Chatsworth Road, Croydon, for Messrs.

Berney & Sons, architects, Croydon. It is just about twelve months since these partitions were first introduced, and at that time Messrs. Peace & Norquoy fixed them in five schools for the West Hartlepool School Board, and after a year's trial we are informed that they received an order for four more partitions from the same Board. There can be no question that architects are finding out that these partitions are without doubt the most simple and reliable method of dividing and subdividing rooms by means of a moveable partition, as they are being used all over England.

Some while ago we noticed in our columns a report by the Rev. T. W. Sharpe, C.B., chief inspector of schools in the Metropolitan Division, in which he complained of the ill-planned rooms which could not be used for teaching without considerable structural alterations. He also complained of a want of a central hall for drilling, &c. Now these are cases which the improved folding partition meets, as a large hall can be divided into classrooms, and for drill, or assembling of the scholars, can be thrown open in a few minutes, leaving the whole space clear.

THE DERBYSHIRE INFIRMARY.

THE new Derbyshire Royal Infirmary, the foundation-stone of which was laid by the Queen on May 21, 1891, was opened by the Duke of Devonshire, accompanied by the Duchess. Their Graces were presented with a golden key, by which they effected their entrance, after which they proceeded to a spacious tent erected in the grounds, where various speeches were delivered. The Duke of Devonshire congratulated his hearers on the successful progress of the work of founding a new infirmary, and said the appeal for subscriptions had been nobly responded to, something like 76,000*l.* having been raised. He announced that Mr. G. H. Strutt, sen., had offered to defray the cost of another ward, which would amount to about 12,000*l.*, on condition that it should bear the name of a deceased relative, this donation being in addition to 5,000*l.* previously subscribed.

The whole of the stonework, including the moulded Hopton Wood stone staircases and the marble work in connection with the lavatories, &c., was executed by Messrs. J. Hodson & Son, of Castle Meadow Road, Nottingham, a special plant being put down on the site to deal with it. The firm have been entrusted with the order for the whole of the stonework for the new County Council buildings at Derby.

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This Patent Partition is constructed of Blocks or Slabs of Plaster material, formed with a series of longitudinal Tubes of Fireproof Material to deaden sound, each block being keyed to the adjoining one by light Iron Clamps, the whole being afterwards plastered on either side, and forming a rigid soundproof and fireproof construction.

When finished, the weight is 64 lbs. to the square yard, against 280 lbs. to the yard in 4 brickwork partition walls. The thickness from face to face is only 3 inches, thus saving enormously in weight and space.

There is no contraction or expansion as in wood partitions. The system is so simple that the partition can be erected by any intelligent labourer, with one assistant, in half the time of ordinary brickwork. The price is very little more than ordinary brickwork.

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147 STRAND, LONDON, W.C.

EARL'S COURT EXHIBITION.

WE have received from the Tubular Lock Syndicate, Limited, 38 Middlesex Street, Aldgate, a sample of their 6 inches by 1 inch patent tubular reversible mortice lock. On examination it is seen that it is fixed by three operations of a centre-bit, one for the lock and two for the face plate, saving about two-thirds of the time spent in fixing the ordinary mortice lock and saves the tenons. Their exhibition lock at Earl's Court is 6 feet by 1 foot, a working model 4-lever lock; it weighs 3 cwt. The handles each weigh 1 cwt. as erected on a wrought-iron stand 8 feet high; it is very effective. This lock had the highest award at Chicago, 1893; also gold medal, Edinburgh, 1890; Paris, 1889; gold medal, prize medal, Melbourne, 1888; Society of Architects' Exhibition, London, 1887; prize medal, Builders' Exhibition, 1886. The firm make all kinds of locks and latches in the tubular form for all purposes; locks made *en suite* with master keys. Specified by some well-known architects. The last notable buildings fitted are Mr. W. Astor's new block on the Embankment. The tubular lock can be used with one handle, two handles, or as a night latch, the key doing the work of the handle. The action of turning the key throws the latch forward, locking it and disconnecting it from the handle until it is turned back by the key, the handle then draws the latch. Any architect who would like to see samples has only to apply to Mr. W. Harvey Stringer, general manager.

The tubular locks are so constructed that the wear is equally distributed over all the working parts, thus ensuring the longest life possible for the locks. The special advantages claimed over other locks are as follows:—The tubular locks are 25 per cent. cheaper than ordinary mortice locks; the cost of fixing is very much less than other locks; the doors are not weakened, as the cutting away of the tenons is not required, this weakening of the doors being unavoidable with all other mortice locks; the tubular locks being reversible can be used for either right or left-hand doors; the key does the work of the handles, so that each lock can be used as a lock or latch, or both, with the key alone; the tubular locks are the only form of locks that admit of the handles being made absolutely fast to the door by means of long screws; the tubular locks are secure, reliable, and excel in simplicity of fixing, in appearance and in durability when fixed, in addition to fulfilling every function of the ordinary two-bolt lock; any number can be made to differ with master key to pass.

VENTILATION AND FLUSHING OF SEWERS.

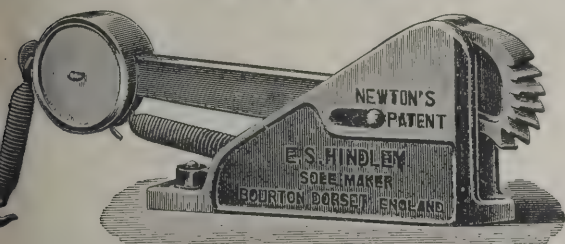
DR. CLARK, the medical officer of health to the Lowestoft Urban Sanitary Authority, has just submitted to that authority an able and lengthy report on the ventilation and flushing of sewers in relation to health. The following are extracts taken from the first part of the report.

After saying he has obtained such information from the medical officers of health of other towns as will he trusts enable the sanitary authority to decide upon some definite policy in regard to the ventilation of the sewers of this borough, he proceeds:—I am informed by your surveyor that there are approximately some twenty-one miles of public sewers within the borough, and these sewers are ventilated by means of a few shafts (9 inches by 6 inches and 6 inches by 4 inches respectively), while there are also 256 manholes and lampholes, of which 81 are closed and 175 open.

It has been laid down as an axiom by Sir Douglas Galton, Sir Robert Rawlinson and others, that public sewers should be ventilated at intervals of not less than 100 yards, so that there should be at least eighteen ventilators to the mile, while the average in this borough is only about ten to the mile. In some towns, however, reference to which is made at the end of this report, the sewers are, I understand, practically unventilated, and I cannot say that the mortality returns of these towns indicate that any serious result has accrued hitherto from this apparent neglect of a duty which the Public Health Act, 1875, imposes upon all sanitary authorities. For some months past I have devoted much care and thought to the consideration of this subject, and I am fain to confess that the stern reality of facts and figures has convinced me that the open manhole, as it exists in this borough, is a standing menace to the health of the inhabitants, and may even be in some cases the actual cause of a disease which was unhappily too prevalent here during the past winter—I mean diphtheria.

A most interesting report has just been issued by Mr. James Mansergh, C.E., a well-known sanitary engineer, upon the ventilation of the sewers at Beckenham, and although it would be unwise to compare such a residential district as Beckenham, where practically the whole of the sewers are of modern construction and well laid, and which has an average of only five persons per acre, with a borough such as our own, where there is an average of considerably over ten persons per acre, yet Mr. Mansergh's report brings out very clearly several most interesting points in connection with sewer ventilation. In the first place the report proves that the multiplication of venti-

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lators does not abolish the nuisance arising from surface gratings, for although there is a ventilator at every 82 yards throughout the whole of the Beckenham district, and this, it will be observed, is considerably in excess of the requirements laid down by engineers, yet great annoyance is experienced from the surface ventilators, in spite of the fact that the sewers were proved to be in good condition, self-cleansing and adequately flushed. To quote Mr. Mansergh's own words:—"It cannot therefore be said that the annoyance experienced from the surface gratings arises from a deficient number of ventilators;" and again, "I have no doubt that the flushing and ventilation are sufficient, using the latter term without regard to the offence caused by it." I take it that this is a most important conclusion, since it considerably discounts the argument that if a surface grating is offensive, it is necessarily so as the result of some temporary and removable defect in the flow of the sewage, which should be dealt with by flushing. To again quote this report, Mr. Mansergh says, "The broad result of this part of the investigation is that I have not been able to discover any defects in the sewers which account for the complaints of foul smells." It would appear therefore that sewage, even in modern sewers, will generate evil-smelling gases, and these should therefore be given vent at a considerable elevation in preference to on a level with the roadway.

Another point brought out by this report is that all ventilators, whether at the road surface or as shafts, act both as inlets and as outlets, according to the varying climatic conditions. This fact, which I have frequently asserted, was proved by means of anemometers, and it may therefore be considered as scientifically proved that surface gratings, even in conjunction with tall shafts, act at times as outlets for the sewer gases. The case, therefore, for or against surface ventilators depends upon the strictly medical question as to whether the emanations from moist sewage are or are not dangerous or injurious to health. Personally I have no hesitation whatever in saying that, in my opinion, exposure to the emanations from sewage has a most depressing and injurious effect upon the vitality of the human organism, and apart entirely from the question of the causation of such diseases as enteric fever or diphtheria, which are due to specific germs, that these emanations produce a deterioration of vital activity which seriously predisposes to actual disease. The advocates of surface-ventilators state that their object is to approximate the condition of the sewers as far as possible to that of open sewers; but if it be proved that the emanations from an open sewer, or,

what is similar, from any deposit of night-soil, moistened with liquid sewage, is injurious to health, then surely such an attraction is the least desirable one that any town can offer, whether to visitors or to its more permanent residents.

If the interior of one of those highly glazed earthenware pipes used to form the first syphon of the modern wash-down water-closet be examined after the closet has been in use for some few months, it will be found to be lined with a thin layer of brownish sewage matter which has become adherent to the pipe as the soil was washed through it by the flush of water from the cistern, and it is only necessary to compare the interior of these pipes with the comparatively rough lining of the ordinary glazed sewer pipe to realise how much more of the soil must be retained by these latter. It must also be remembered that for almost two-thirds of every twenty-four hours little or no water passes through the sewers, except in times of heavy rain, and it is easy to imagine how such smells arise as those which emanate from surface gratings, for as this film becomes uncovered by water, it rapidly decomposes, thus presenting much the same condition as the periodically exposed foul foreshore of a sewage-laden river. In times of storm sand and grit are washed into the sewers with the rain and scour the interior of the pipes, removing this decomposing crust for a brief time, and hence it is that after heavy rains these surface ventilators cease for a few days to be offensive. The smells whether from defective house-drains or from surface gratings are to be looked upon simply as warnings, and if such warnings are persistently disregarded, sooner or later ill will come of it.

The result aimed at by the use of the sewer ventilators, which are placed purposely at different elevations, is to freely dilute any noxious vapours that may be generated in them "by causing unceasing motion and interchange betwixt the outer air and the inner sewer," and had we only to deal with the evil-smelling and poisonous gases generated by the putrefaction of the sewer contents, there can be no question that the creation of constant currents of fresh air through the sewers would, in conjunction with copious flushing, be the correct and only remedy. The less movement of the air of sewers we create the less likelihood will there be of any disease-germs being carried into the outer atmosphere; and one of the greatest faults of the modern system of sewer ventilation is this persistent creation of draughts throughout the length of our sewers. We must aim at comparative stillness of the sewer air and be content to provide small outlets here and there, at high elevations, which shall act solely as safety-valves, giving exit to the sewer gas

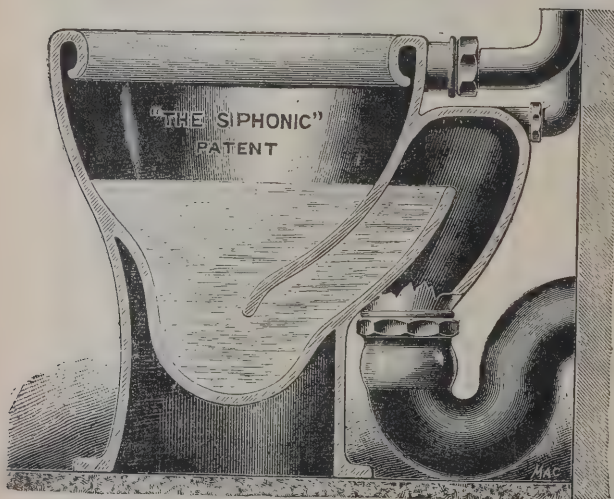
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when the internal pressure is greater than that of the atmosphere, and *vice versa*, admitting air to the sewers when the internal pressure becomes negative. The result of this will probably be that the sewer gas will be more concentrated and therefore more poisonous, resembling, in fact, the gas at the bottom of a deep well, but as it is contained in the sewer and has no tendency to leave the sewer, so long as the internal and the external pressures are equalised by these "safety valves" no harm will accrue, provided that when sewer-men wish to enter the sewer they do first flush that portion which they wish to enter, opening at least two adjacent manholes while they flush. Surely it were better to give the sewer-men a little more trouble before entering a sewer, less trouble, in fact, than they would have to take before descending a well, than to persistently mingle with the air we breathe sewer gases which may and often do carry with them the germs of disease. I know it will be argued that under such circumstances the concentrated sewer gases will be sucked into houses from faulty drains by the aspiration of the fires, &c., but if the by-laws relative to the use of interceptors and all the other restrictions imposed upon builders, whenever drains pass under the houses, are obeyed no such danger could arise; and I can moreover point with confidence to the mortality statistics of those towns which do not ventilate their sewers, as a powerful argument against this theory.

I may add also that the experience of the recent outbreak of diphtheria in this borough, which is practically dependent entirely upon the storm-water for the flushing of the sewers, has demonstrated to me the fact that fresh cases occur almost invariably after two or three days of fine dry weather, the germs presumably drying on the sides of the sewers and being carried by the draughts through the sewers into the atmosphere, and that the occurrence of rainy weather is marked by a temporary cessation of the cases, in spite of the fact that the entrance of the storm-water into the sewers forces out some of the gases into the streets and possibly even into some of the houses.

Dr. Sidney Davies, medical officer of health for Plumstead, has pointed out a striking comparison between the incidence of diphtheria upon the two sanitary districts of Woolwich and Plumstead. It appears that these two districts are contiguous, Plumstead being in reality merely an extension of Woolwich; the former has a population of 55,000 and the latter of 41,000. They are on the same soil, have the same water supply and practically the same milk supply, while the sewage of both districts is discharged into the Southern London Outfall Sewer.

Woolwich has, however, a large proportion of old brick sewers with insufficient fall, while Plumstead has pipe sewers, and is built on the side of a steep hill. The bulk of the houses in each are four or five-roomed with water-closets outside. Woolwich has a good many slums, and its sanitary arrangements are certainly not all that could be desired, while Plumstead has no slums, and its sanitary arrangements are more in keeping with modern requirements. These two districts are under different sanitary authorities, and consequently while Woolwich has no grid ventilators and very little sewer ventilation of any kind, Plumstead has grid ventilators in every street, and the sewers are also ventilated by shafts. Such being the conditions of the two districts, Dr. Davies proceeds to point out that during the past four years, Plumstead with its better sanitary arrangements (bar the grid ventilators) has had three times as many deaths and four times as many cases of diphtheria as Woolwich. Scarlet fever and typhoid fever appear to be equally prevalent in the two parishes, while diarrhoea, which is due not so much to sewer gases and their constituents as to sewage-contaminated soil, is, as would be expected, more prevalent in the Woolwich district where the old brick sewers still exist. Dr. Davies shows that the increase of diphtheria in Plumstead is contemporaneous with the introduction of the grid ventilators, while in that part of the district in which exist shafts as well as the grid ventilators, the number of cases is less than where no shafts exist.

The remedy suggested by many for the purification of sewers and the abolition of the nuisance arising from surface gratings is more copious and more systematic flushing with water, and there can be no question that in addition to the cleansing effects of a sudden rush of water along a closed conduit, that water has immense capabilities of absorption of the sewer gases, and where practicable this is undoubtedly an integral part of the duty of every sanitary authority, although to judge from the report of Mr. Mansergh, it cannot be relied upon to abolish the nuisance of surface ventilators. I cannot, however, disregard the fact that this flushing is most essential in hot dry weather, and it is just at such times that many towns are put to great straits to secure a sufficiency of water for drinking and domestic purposes, and when we see great cities compelled to cut off their water supply for more than half of every twenty-four hours, as several did during the drought of last year, it seems hopeless to rely solely upon flushing for the harmlessness of our sewers, since it is obvious that when most needed the system almost invariably breaks down.



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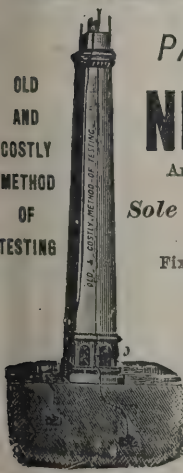
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There is less excuse in this respect for such towns as are contiguous to the sea, and I have very little doubt that in years to come these towns will value their potable water far too highly to pour it into their closets and sewers, and that a separate service of sea water, which can be had for the pumping, will be utilised for all such purposes.

VENTILATION AND WARMTH.

AN interesting article on the above subject appears in the current number of the *Lancet*, which deals with the subject from an impartial point of view. The writer says:—Everyone must admit that our present systems of heating are far from satisfactory, and that many of the existing methods of ventilation are crude and clumsy if not often dangerous, and yet there are but few indications of steps being taken to effect any real improvement. Progress, indeed, in warming and ventilation, especially in this country, is practically barred by prejudice and the fixity of sentiment. As far as the heating of large buildings is concerned, however, this sort of objection may be waived, since it is in the home chiefly that the Englishman cherishes the open system of firing with its cheery glow, which in his mind in the dark, dreary evenings of winter is associated with and is symbolic of comfort, hospitality and welcome. We have already shown how the question of sentiment may be set at rest by the adoption of appliances which are satisfactory also from the scientific, sanitary and economical point of view.

It is evident that if draughts could be properly controlled, and could conveniently and economically be converted into warm, unvitiated currents of air, we should possess an admirable means of heating and ventilating our dwellings, and many an invalid and delicate one would be spared the dread of the approach of winter. Such is practically the end in view of a system of heating and ventilating which has quite recently been brought to our notice by Mr. John Grundy, of 30 Duncan Terrace, City Road, London, and Tyldesley, near Manchester, who, though he emphasises the advantages to be gained by the use of a central heating apparatus (which is also smoke-consuming), has further given his attention to ordinary grates so constructed as to consume smoke, thus obviating loss and waste of heat and economising fuel. The Grundy system of heating buildings, which aims also at supplying fresh warm air in the rooms of dwellings, is, with its improvements, embodied in the apparatus about to be described. A working model of

this apparatus was exhibited recently at the Agricultural Hall. The heating chamber is conveniently located in the basement of the building, and very little bricklayer's work is required, it is stated, to complete its setting. The air enters from the outside by a screened window into the fresh-air chamber, where any dust carried in with the air can settle down, and is then admitted by a sliding door or throttle-valve into the fresh-air passage, and thence to the heating chamber. The fresh-air passages can be entered by an attendant through the access-door for the purpose of cleaning out whatever may have been carried in from the outside, and the access to the heating chamber proper by the door provided to clean the apparatus itself and the heating chamber, which should be done at the beginning of each winter. The pure warm air passes along the ceiling of the heating chamber and enters into the vertical or horizontal flues leading to the rooms to be heated. Each room has a separate flue, with a warm-air inlet about 6 feet above the floor. The vitiated air is removed by a separate flue leading above the roof and having exhaust valves, one a little above the floor for winter ventilation, and another immediately below the ceiling for summer ventilation. Although it is possible to regulate the total heat produced in each heating chamber by the quantity of fresh air admitted, it is yet impossible to warm all the rooms equally and ventilate them properly as well, for some rooms being less exposed naturally attain the desired temperature sooner than others. In some rooms the temperature may rise rapidly on account of gas flames or of a large number of people being assembled, and it is therefore of importance to give each room warm or cold air just as may be required to attain this. The fresh air channels begin below the ceiling of the heating chamber and are connected with the fresh air passage. In each fresh air passage there is a mixing valve regulated from without, by which pure cold and pure warm air can be mixed in any proportion. When the heating begins these mixing valves are closed, but as soon as in any room the temperature threatens to rise above the degree desired the mixing valve is opened so as to admit sufficient cold air to counterbalance such an excess and the exact degree desired can thus be obtained and maintained. By means of a throttle-valve placed in the warm air flue a room may be completely cut off from all heating and ventilation. When desired the in-coming fresh cold air, prior to passing through the heating chamber, can be filtered in a very simple and perfectly automatic manner.

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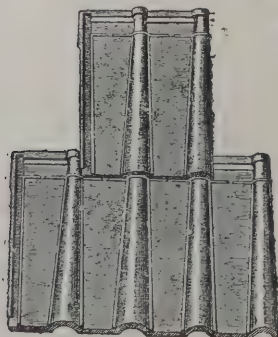
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the carrying out of the work has to be adapted to the special conditions and requirements of each case. The system appears to us to present many important features in regard to the healthy warming and ventilation of dwelling-houses. Thus, according to our observations the air so warmed is not deteriorated by over-heating (in contact, for instance, with hot metallic surfaces), its inspiration produces no oppressive feeling, and it does not become "devitalised" as is the case with so many forms of heating appliances. Whilst, however, we see no reason to doubt the important hygienic advantages which the adoption of such a system would confer, yet we cannot speak from experience on such points as the labour involved in its installation, the expense of outlay and maintenance, or as to how far its application to modern requirements would be really practicable. The application of the system to cathedrals, public halls and dwellings has, we understand, given general satisfaction—a result which is quite in accord with our own observations of its working powers. We need hardly add, however, that we cordially approve of a system which not only aims at the healthy heating of buildings but, at the same time, at providing, suitably tempered, a constant influx of pure fresh air. When properly installed there is no reason to doubt that such is the desirable end the system referred to attains.

EXPLOSIONS IN DOMESTIC BOILERS.

A DEPUTATION representing the Manchester Steam Users Association presented a memorial to the President of the Board of Trade (Mr. Bryce) asking that an independent investigation, such as that held under the Boiler Explosions Acts, 1882 and 1890, in the event of every steam boiler explosion, and also in the event of every heating boiler explosion, should be held in the event of every domestic boiler explosion, so that the true cause of such disasters and the best means of preventing them may be ascertained and published in every case. The deputation was introduced by Sir J. Fergusson, M.P., and there were also present Sir H. Roscoe, M.P., Mr. Holland, M.P., Mr. Weir, M.P., Mr. Adam Dugdale, president of the association, and Mr. Lavington E. Fletcher, chief engineer. The memorial set forth two tabular statements; one showing that owing to the frost in January last as many as 22 domestic boiler explosions occurred, by which one man, six women and three children were killed, as well as four men, 19 women, and six children injured; the second showed that during the frost in

January 1881 as many as 32 domestic boiler explosions occurred, by which three men, three women and three children were killed, as well as two men, 22 women and one child injured. The fact that the Association has recorded as many as fifty-four domestic boiler explosions as having occurred during two short frosts, killing nineteen persons and injuring fifty-four others, while doubtless there were many other explosions, showed the importance of the subject. The cause of domestic boiler explosions was extremely simple, but had been much mystified and much misunderstood. It was very generally supposed that during a frost the boiler ran dry and became red hot, and that on the occurrence of the thaw the water found its way again into the boiler, when so rapid a generation of steam took place and so irresistible a pressure resulted that the boiler was shivered into pieces as with a charge of gunpowder. This view of the case was unfounded. As long since as the year 1867 the M.S.U.A. instituted a series of experiments. Three domestic boilers, two of them of copper and one of cast-iron, were made red hot and then subjected to a sudden admission of cold water, the water being injected in one case through a pipe having a bore of half an inch connected to the water company's main, and in two other cases through a pipe having a bore of 1 inch connected to an overhead tank. In no case, however, did any explosion result. The boilers remained perfectly still and entirely unaffected. In one experiment a safety valve was placed on the boiler, but enough steam was not generated to make it blow, while the feed-pipe was found to get hot for some 15 feet from the boiler, as if the steam were beating back and forbidding further entry of the water. All the attempts to explode the boilers by the injection of cold water failed, though every endeavour was made to succeed, and everything that glowing red-hot plates and cold water could do was done. Further, in the year 1882 the Association instituted a second series of experiments of a somewhat similar character, but on a larger scale. The furnaces of a Lancashire mill boiler 7 feet in diameter and 27 feet in length were made red-hot and then subjected to a shower-bath of cold water, this treatment being repeated again and again. No explosion, however, resulted, nor was there any sudden generation of steam or rise of pressure. Thus this second series of experiments corroborated the results obtained by the previous series, and confirmed the view that no sudden and irresistible generation of steam took place, and that no gunpowder action was set up on showering cold water on red-hot plates. Domestic boiler explosions were

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due simply to a gradual accumulation of pressure in consequence of the outlets being choked. The choking in some cases arose from the accumulation of ice, in others of incrustation, while in others again, where the circulating pipes were fitted with stop-taps, the choking arose from the shutting of those taps. Choking the outlets bottled up the water and steam, so that the pressure went on accumulating until it exceeded the resisting-power of the boiler and an explosion ensued. The remedy for domestic boiler explosions was to apply a small safety valve. The memorialists, however, did not recommend that the adoption of these safety valves should be rendered compulsory. What they recommended was that an independent investigation, such as that held under the Boiler Explosions Acts, 1882 and 1890, in the event of every steam boiler explosion, and also in the event of every heating boiler explosion, should be held in the case of every domestic boiler explosion, so that the cause of such disasters and the best means of preventing them might be ascertained and published in every case. The memorialists did not recommend the compulsory inspection of working domestic boilers, to which objection might be raised by some householders, but simply an investigation after an explosion had occurred, so as to ascertain the cause of the disaster. This would show the householder how to protect himself in future and at the same time disseminate information for the benefit of the general public. It was pointed out that the sufferers from domestic boiler explosions were chiefly women and children living in "jerry-built" and badly-appointed houses.

In reply to the deputation Mr. Bryce said this was a very important question. It involved the lives and personal safety of a large number of people; above all, a class who were perhaps least able to protect themselves—he meant domestic servants. They had no control over the mechanism of the boilers in the kitchens and places where they had to work. Their complaints might go unheeded by the employer, and therefore they were in a special manner entitled to any protection the State might give them. This was also an interesting question as raising large questions of policy. They might have such a theoriser as Mr. Herbert Spencer dwelling on the large steps in the direction of still further State interference involved in the assumption by the State of the duty of inquiry into what happened in a private house. Coming to the practical matter, however, he understood the object of the Association was a purely philanthropic one. They did not propose the State regulation of these boilers, but they considered an investigation

of the accidents arising from them was sufficient to effect their two objects—first, the calling of public attention to the dangers which every basement of a house contained in its boiler, and secondly, to the cause of the explosions. There were two ways of attaining their object—one, as suggested, by an investigation, and the other by making the use of the safety valve compulsory, which latter, as he understood, they did not advise. It would at first sight appear to be the more obviously effective course to require the compulsory adoption of the safety valve if they were satisfied that that would be an efficient remedy than to press the indirect remedy of an investigation.

Mr. Fletcher said he should be glad to see the adoption of the safety valve made compulsory, but there would be much opposition to the proposal. It would also necessitate an extensive system of inspection.

Mr. Bryce, referring to the other proposal of the deputation, said he thought they underrated the opposition that would be excited. He did not say there were not strong arguments in its favour, but the feeling that a man's house was his castle was very strong. As an illustration, he might mention that the only condition on which the Government was allowed to pass the Notices of Accident Bill was the exemption from its provisions of employments in which domestic servants were concerned. Had the Bill passed without this exemption the way of the Association would have been easier, because they could then have applied to him to bring domestic service in the schedule of employments contained in the Bill, and their object would have been attained. That could not be done now. If they liked to try the matter they had better get someone in the House of Lords, where the Bill was pending, to move the question there and have a debate upon it.

Sir H. Roscoe thought the suggestion was a good one.

Mr. Bryce repeated that he did not think the proposal would pass with so little opposition as the deputation appeared to think. It would be only fair, before expressing a decided opinion on behalf of the Board of Trade, that an opportunity should be given to those who held an opposite view to be heard on the subject. It would be well, too, that the deputation should endeavour to obtain more complete statistics on the subject, because if they could show the explosions were increasing rather than diminishing in number they would strengthen their case. He could assure the deputation, however, that the matter would continue to receive his earnest consideration.

The interview then terminated.

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CENTRAL FOUNDATION SCHOOLS OF LONDON.

The new wing of Cowper Street Schools, opened by Sir Henry Scott, has been built on what was formerly an open yard, forming an entrance to the playground. The Governors having the necessity of having properly equipped laboratories for the teaching of chemistry and physical science, advantage was taken of this space at the west end of the existing school for the erection of the new additions. The new building is of three storeys with one room on each floor, entered from the end of the school corridors. The ground floor is for the greater portion left open for light and access to basement and playground, and the main front wall of the building over is carried on columns and arches executed in Portland stone. On this floor is a room suitable to be used as an office. On the first and second floors are placed the physical and chemical laboratories respectively. These are lofty rooms of about 33 feet high, amply lit by large windows on two sides, the main front windows facing due north. The chemical laboratory on the second floor has additional light through the open roof from skylights. In erecting the new building the architects had to contend with a source of trouble from the adjoining premises the shape of vibration, caused by heavy grinding machinery. This was overcome in a large measure by completely isolating the new building on the west side where it adjoins the factory, and by using thick layers of felt in the walls under the floors at various levels. It will be seen in viewing the laboratories as now finished that they have been fitted and equipped in a very complete manner. All the fittings have been made from drawings made by the architects, with the advice of Mr. Wormald and the chemistry master, and have been approved of by the Science and Art Department, and are executed in pitch-pine wood with teak tops throughout. The chemical laboratory is fitted to teach thirty-six boys, and each boy is supplied at his place at the tables with gas and water and a special evaporation niche for small experiments. In addition to these, for the general use of the boys, sink cupboards and combustion hood for larger experiments are provided. In the floor of this laboratory are a complete system of drains and pipes, taken from all the tables for waste and exhaust purposes, and all are accessible and under control. The fittings in the physical laboratory are of a similar substantial character to meet the requirements of the teaching. These rooms are heated by low-pressure hot water. Ventilation is provided by means of fresh air inlets behind the heating radiators, with extracts

from the ceilings of each room to the main extract turret in the roof. The building externally presents a simple but effective front to Cowper Street, and is in Suffolk brick and Mansfield stone, with arcade on ground floor of Portland stone. The building and its fittings has been erected from the designs of Messrs. Thomas & Howard Chatfield Clarke, of Bishopsgate Street Within, by Mr. B. E. Nightingale, of Lambeth, in a satisfactory manner, the cost for building and fittings approaching 3,500*l.* The London County Council provided a grant towards the cost of the fittings.

NATIONAL REGISTRATION OF PLUMBERS.

LIST OF REGISTERED PLUMBERS.

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BEESON, S. E., Church Street, Rickmansworth.
CRABBE, W. J., 21 Iveley Road, Clapham, S.W.
HEATH, J., 13 Worland Road, Stratford.

Provincial Masters.

BAKER, E., Corporation Road, Middlesbrough.
BAKER, T. N., Corporation Road, Middlesbrough.
BREARCLIFFE, T., Low Street, Horsforth, Leeds.
GOODALL, F., Green Bower, Marsden, near Huddersfield.
JAGGER, W. H., Elizabeth Street, Elland, Yorks.
SALTHOUSE, W., 21 Church Street, Preston.

Provincial Journeymen.

BOWMAN, A. T., 10 Selbourne Place, Roxburgh Road, Leeds.
DUTHIE, P., 224 High Street, Perth.
FORDHAM, F., 6 Berners Street, Wakefield.
GOLDIE, D., 1 Thomson Street, Dundee.
GRANT, T., 28 Green Street, Cardiff.
HARRISON, T., 227 Station Road, Bamber Bridge, near Preston.
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HENDERSON, A., 31 Charles Street, Dundee.
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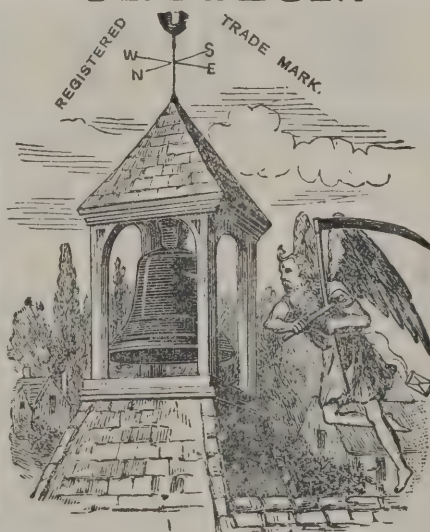
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Eiffel Tower, Paris
Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS-HUDDESFIELD, 1883, LONDON, 1885.
SILVER MEDAL-PARIS, 1889.

LANGSTAFF, G. R., 27 Albert Terrace, Skirbeck, Boston, Lincs.
 MARSHALL, C., 2 Wilkinson Street, Burmantofts, Leeds.
 STORY, J., 25 Oatland Place, Leeds.
 STORY, J., 27A Chapeltown Road, Leeds.
 WEBSTER, J., Fox Street, Carnoustie, N.B.
 YOUNG, A., 15 Blackness Street, Dundee.

MR. ALDERMAN WHITE, J.P., chairman of the Norwich Technical Education Committee, presided at a public meeting held at the Technical School, Norwich, for the purpose of inaugurating the District Council for Norfolk and Suffolk to act in conjunction with the Worshipful Company of Plumbers, London, in carrying out the national registration of duly qualified plumbers. Among those present were Dr. Cooper Pattin (medical officer of health), Dr. Barton, Councillor Boardman, F.R.I.B.A., Councillor King, Mr. H. J. Green, A.R.I.B.A., Mr. J. Brooks (chief sanitary inspector), Councillor Breese (vice-president of the sanitary committee), and Mr. F. R. Widdows. There was also a large attendance of master and operative plumbers, as well as sanitary authorities and others interested in the question of public health and plumbers' work.

Mr. W. H. Bishop, past master of the Worshipful Company of Plumbers, attended and delivered an address on the principles and objects of registration.

Mr. Alderman White said that there could be no doubt that valuable lives had been sacrificed through bad plumbing, and all citizens would appreciate a movement which went in the direction of good health. He had always felt that the plumbing class was one of the most important and successful sections of the work carried on at the Norwich Technical School, and he was pleased to say that great success had crowned the efforts of the instructor, and that 75 per cent. of the students had passed the examination recently held by the City and Guilds of London Institute.

The following were elected to form the District Council:—

Master Plumbers.—Messrs. T. C. R. King, G. A. King, W. Bird, J. A. Norman, G. Versey, F. W. Rogers, A. Stearn, E. W. Johnson, W. Priest and J. Gooch.

Operative Plumbers.—Messrs. J. Murrell, R. Simpson, W. J. Cladburn, T. Sayer, A. N. Paul, C. Riches, W. J. Taylor, T. E. Sacker, J. W. Curson, and W. Wright.

The Public.—Dr. W. H. Cooper Pattin (medical officer of health), Drs. C. Williams and S. H. Burton, Alderman Ladell

(chairman, sanitary committee, Norwich Town Council), Councillor Breese, Alderman Dakin, Councillor Boardman, Mr. S. Cozens-Hardy, Mr. W. J. Allen, and Mr. F. W. Harmer.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

12848. Thomas Jones and John Charles Jones, for "Improvements in the construction of window-sashes and in sash window-fasteners."

12860. Henry Brooks, for "Improvements in pipes."

12905. Cecil Warburton Knox, for "Improvements in roofing tiles."

12930. Simon Fletcher, James Fletcher and John Duncan Fletcher, for "Improvements connected with windows."

13065. James Alfred Glazier, for "Improvements in or connected with the frames of sash windows."

13074. Siegfried Radleur, for "An improved automatic disinfecting apparatus for water-closets."

13116. John Gordon, for "Method of making glazed bricks, tiles and the like."

13127. Cesare Righini, for "Improvements in or relating to apparatus for flushing water-closets."

13181. George Brindley, James McEwen and Samuel Thompson, for "Improvements in and relating to syphon cisterns and waste-water preventers."

To INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

It is proposed to build a new fish market for Leeds, and the scheme will be considered at the next meeting of the County Council.

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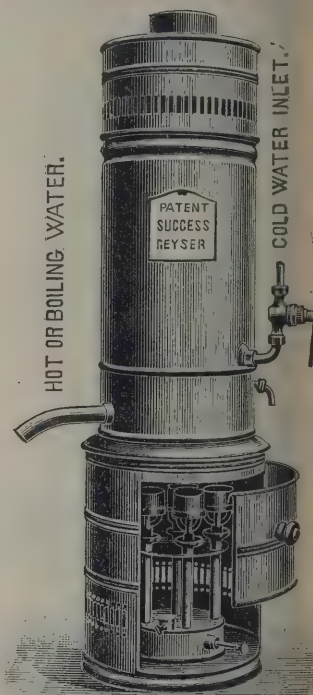
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

* * As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

* * Owing to an accident the publication of the Index to Vol. LI. has been unavoidably delayed. It will be published in our issue of August 3.

CONTRACTS OPEN.

ABERCARN.—Aug. 7.—For Building Two Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.

ABERDARE.—Aug. 7.—For Building Two Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.

ABERDULAIS.—July 31.—For Building Vestry. Mr. Wm. Rees, 14 Tonna Terrace, Aberdulais.

ALNWICK.—July 28.—For Building St. James's Presbyterian Church. Mr. W. Lister Newcombe, Architect, 89 Pilgrim Street, Newcastle-on-Tyne.

ANNFIELD PLAIN.—Aug. 6.—For Building Two Houses. Mr. G. R. Appleby, West Kyd, Annfield Plain, Durham.

ASHFORD.—July 27.—For External Iron Staircases. Mr. C. D. Hume, Clerk to the Managers of the West London School District, Ashford, near Staines.

ASHFORD.—July 27.—For Supplying and Fixing Hydrants, Supplying Hose, &c., at District School. Mr. C. W. Hume, Ashford, Middlesex.

ASHTON-UNDER-LYNE.—For Adding Storey and other Works to large Warehouse and Building Shop and Dwelling-house. Mr. T. D. Lindley, Architect, Ashton-under-Lyne.

AYLESBURY.—July 28.—For Building Public Baths. Mr. George Fell, Clerk, 2 Rickford's Hill, Aylesbury.

BARRY DOCKS.—For Building Business Premises for Mr. W. Bryant, Spirit Merchant. Mr. E. Axten, C.E., Barry Docks.

BASFORD.—Aug. 13.—For Building Two Cottages at Outfall Works, Greasley. Mr. Herbert Walker, Engineer, Newcastle Chambers, Nottingham.

BATH.—July 27.—For Vapour Baths in connection with the King's Baths Establishment. Mr. A. Amor, Octagon Chambers, Milsom Street, Bath.

BECKENHAM.—July 30.—For the Supply of a New 10-ton Steam-roller and Purchase of Old One. Mr. J. A. Angell, C.E., Local Board Offices.

BEDMINSTER.—July 30.—For Building Board School. Mr. Edward Gabriel, Lucas Hall Chambers, Baldwin Street, Bristol.

BELFAST.—July 30.—For Building Chimney, Claredon Graving Docks Yard. Mr. G. F. L. Giles, Harbour Engineer, Belfast.

BELFAST.—July 31.—For Building Constabulary Barracks. Mr. P. J. Tuohy, Secretary, Office of Public Works, Dublin.

BIRCLE.—For Building Offices, Storerooms, &c., at Bleach Works. Mr. C. H. Openshaw, Architect, Derby Chambers, Bury.

BIRKENHEAD.—July 31.—For Building Workshops at Workhouse, Tranmere. Mr. J. C. Ogle, Architect, 34A Hamilton Square, Birkenhead.

BODMIN ROAD.—Aug. 7.—For Building House and Three Cottages at Railway Station. Mr. G. K. Mills, Secretary, Paddington Station.

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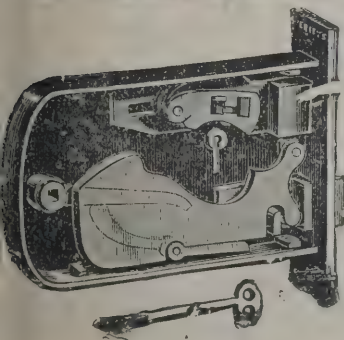
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CATALOGUES FREE BY POST.



- BOOTLE.—July 30.—For Alterations to Town Hall. The Borough Surveyor.
- BOSSINGTON.—July 28.—For Building Chapel. Rev. J. Johns, Porlock.
- BRADFORD.—July 28.—For Building Wool Warehouse. Mr. F. Beanland, Ivegate Chambers, Bradford.
- BRIGHOUSE.—July 30.—For Building Bank Premises. Mr. C. S. Nelson, Architect, 10 Park Row, Leeds.
- CAMBERWELL.—July 27.—For the Construction of a 24-inch Pipe Sewer. Mr. O. S. Brown, Surveyor, Vestry Hall.
- CAMBORNE.—Aug. 7.—For Railway Station Buildings, &c. Mr. G. K. Mills, Secretary, Paddington Station, W.
- CARDIFF.—Aug. 7.—For Building Railway Stations. Mr. G. K. Mills, Secretary, Paddington Station, W.
- CARDIFF.—August 8.—For Reconstruction of Baths, Guildford Crescent. Mr. W. Harpur, Borough Engineer.
- CARLISLE.—July 30.—For Building Eight Cottages. Mr. W. Pogson, Architect, Devonshire Chambers, Carlisle.
- CHELSEA.—July 31.—For Supply and Delivery of Yellow Deal, Kauri and Yarra Wood-paving Blocks. Mr. T. W. E. Higgins, Surveyor, Town Hall.
- CHESTER.—July 28.—For Building River Wall, Roodee. Mr. H. Enfield Taylor, Engineer, 15 Newgate Street, Chester.
- CHRISTCHURCH.—Aug. 25.—For Adding Block to Men's Quarters at the Workhouse. Mr. E. H. Burton, Architect, Bournemouth.
- CHRISTCHURCH.—Aug. 25.—For Building Cottage Homes and Schools. Mr. A. Druitt, Clerk to the Board of Guardians. Mr. E. H. Burton, Architect, Bournemouth.
- CLECKHEATON.—For Building Engine House to Netherfield Mill. Messrs. J. Young & Co., Architects, 62 Market Square, Bedford.
- CO. DOWN.—Aug. 12.—For Building Two Dwelling-houses, Newcastle. Mr. Henry Hobart, Architect, Dromore, Co. Down.
- CO. GALWAY.—Aug. 6.—For Rebuilding Lisbeg House, Eyrecourt. Mr. J. Smith, Engineer, Ballinasloe.
- COWLEY.—Aug. 1.—For Building Water Storage Tower at Poor Law Schools. Mr. W. H. Castle, Surveyor, Grove Street, Oxford.
- CROOK.—Aug. 2.—For Additions, &c, to Board Schools. Mr. H. T. Gradon, Architect, Durham.
- CWMBACH.—Aug. 7.—For Building Three Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.
- DARLINGTON.—Aug. 7.—For Building Permanent-way Workshops. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.
- DARRINGTON.—July 31.—For Alterations, &c., to School. Messrs. Rawlence & Squarey, Rolleston Street, Salisbury.
- DEVIZES.—July 31.—For Periodical Painting and Works in Connection therewith. Lieut.-Colonel J. du T. Boyle, Commanding R.E., Weymouth Sub-District.
- DRIGG.—July 27.—For Improvements to Farmhouse and Buildings. Mr. William Hodgkin, Drigg, Cumberland.
- DUNDEE.—Aug. 7.—For Building Public Library and Baths at Loches. Mr. J. Murray Robertson, Architect, 33 Albert Square, Dundee.
- EAST BARNET.—July 27.—For Building Four Pairs of Cottages. Mr. W. Jackson, 1 St. Wilfrid's Road, New Barnet.
- EMSWORTH.—July 27.—For Alterations to National Schools. Mr. H. A. Dixon, Architect, Emsworth, Hants.
- EXETER.—Aug. 10.—For Galleries at Victoria Hall for Church Congress. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.
- FARNHAM.—For Building Board School and Teacher's House. Mr. Paxton H. Watson, Architect, West Street, Farnham, and 19 Craven Street, London, W.C.
- FLEET.—Aug. 1.—For Alterations to Schools. Mr. Vining, 11 Hendford, Yeovil.
- FULHAM.—For the Supply of about 7 Acres of Turf, Manager, Hurlingham Club, Fulham.
- GRANTHAM.—Aug. 7.—For Supply of Galvanised Iron Hospital. Mr. J. Evans, Borough Surveyor.
- GREAT YARMOUTH.—July 31.—For Repairs, Painting, &c., and Installation of Electric Light at School of Art. Mr. J. W. Cockrill, Borough Surveyor.
- HALIFAX.—Aug. 2.—For Building Five Shops and Houses. Mr. Medley Hall, Architect, 29 Northgate, Halifax.
- HAMBLEDON.—July 28.—For Additions to Board School. Mr. J. A. Best, Clerk, High Street, Hambledon.
- HARDINGSTONE.—July 30.—For Drainage of Far Cotton, near Northampton. Mr. John Ingham, 7 George Row, Northampton.

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LEE.—Aug. 2.—For Erection of Nineteen Shops. Messrs. F. & W. Stocker, 90 Queen Street, E.C.

LEWISHAM.—July 31.—For Kerbing, Tar-paving, Metalling and Channelling Work. Surveyor, Board of Works Offices, Catford.

LIVERPOOL.—Aug. 7.—For Alterations to Railway Offices, 11 James Street. Mr. G. K. Mills, Secretary, Paddington Station, W.

LLANBRADACH.—July 30.—For Building Schoolroom. Rev. D. M. Jones, 147 Wood Street, Treforest.

LLWYDCOEED.—Aug. 3.—For Building Church. Mr. G. E. Halliday, Architect, 14 High Street, Cardiff.

LYMINGTON.—July 28.—For Carrying-out Works in Connection with New System of Drainage. Mr. T. C. Miles, Observer Chambers, Bournemouth.

MASBOROUGH.—Aug. 2.—For Building Three Houses. Mr. J. Axleby, Architect, Wilton Lane, Masborough.

MERTHYR TYDFIL.—Aug. 1.—For Building Board School, &c. Mr. E. H. Lingen Barker, Architect, 146 St. Owen Street, Hereford.

MERTHYR TYDFIL.—Aug. 7.—For the Erection of Public Offices and County Courts. Mr. E. A. Johnson, M.S.A., Abergavenny.

MONMOUTH.—Aug. 4.—For Fittings and Furniture for Post Office. The Borough Surveyor, Priory Street, Monmouth.

MOTTRAM.—Aug. 4.—For Store and Mixing House, Precipitating Tanks, Filters, Channels, &c., and Pipe Sewers. Messrs. Foster, Son & Bardsley, Engineers, 23 John Dalton Street, Manchester.

NELSON.—July 30.—For Construction of Two Storage Reservoirs and Other Works. Messrs. John Newton & Son, Carlton Buildings, Cooper Street, Manchester.

NEW BASFORD.—Methodist Chapel and School. Mr. H. Harper, Architect, Tavistock Chambers, Market Place, Nottingham.

NEWBURY.—Aug. 2.—For Additions to Boys' British School. Mr. Walter Henry Bell, Architect, The Market Place, Newbury.

NORTH-EASTERN RAILWAY.—Aug. 8.—For Building Goods Warehouses at Amble and Broomhill, and Station-master's House. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

OXFORD.—July 28.—For Building Corn Exchange, Fire Brigade Station, &c. Mr. H. W. Moore, Architect, 6 Beaumont Street, Oxford.

PEMBROKE.—July 30.—For Additions to Schools. Mr. John E. P. Ladd, Architect, Main Street, Pembroke.

PENTYRCH.—July 30.—For Additions to Master's House. Mr. J. J. Evans, Architect, Sunnyside, Penarth.

PRESTWICH.—Aug. 10.—For Building Two Blocks at Asylum. Messrs. H. Littler & Son, Architects, 4 Chapel Walks, Manchester.

PURSTON.—Aug. 3.—For Building 'Infants' School. Mr. W. H. Fearnley, Architect, Station Lane, Featherstone.

RAMSBOTTOM.—Aug. 8.—For Building Technical School. Mr. Arthur W. Smith, Surveyor, Callendar Street, Ramsbottom.

READING.—July 31.—For Additions to Board School. Mr. S. Slingsby Stallwood, Architect, Market Place, Reading.

ROATH.—For Alterations to Congregational Church. Messrs. T. Waring & Son, Architects, Charles Street, Cardiff.

ROCHESTER.—Aug. 1.—For Building Six Cottages. Mr. W. Banks, Guildhall, Rochester.

ROCHESTER.—Aug. 1.—For Making-up Certain Streets in the City. Mr. Wm. Banks, City Surveyor, Guildhall, Rochester.

RUSHDEN.—For Building Two Shops. Mr. H. Adnitt, Harboro Road, Rushden.

SEDFIELD.—July 31.—For Additions to Workhouse. Mr. H. T. Gradon, Architect, Market Place, Durham.

SEVENOAKS.—Aug. 4.—For Building Board School and Master's House. Mr. Thomas Potter, Architect, 49 London Road, Sevenoaks.

SIDDAL.—Aug. 8.—For Building Wing to Board School. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

SLOUGH.—Aug. 16.—For Supply of about 325 Tons of 12-inch Cast-iron Pipes, Bends, &c., delivered free to the Slough Goods Station on the Great Western Railway, or to the Stoke Road Wharf of the Grand Junction Canal. Mr. John Baker, A.M.I.C.E., Mackenzie Street, Slough.

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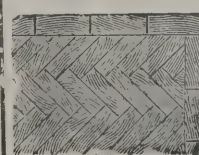
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SOUTHAMPTON.—July 27.—For Two Underground Conveniences, Blue Brick Paving, Channelling Works, &c. Mr. W. B. G. Bennett, Borough Surveyor, Southampton.

SOUTH ELMSALL.—For Building Villa. Mr. W. E. Richardson, Architect, Imperial Buildings, Bond Street, Leeds.

SOUTHOWRAM.—Aug. 7.—For Building Mission Room. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

SPITTAL.—July 30.—For Completion of Parish Church Tower. Mr. M. Temple Wilson, Architect, 29 Narrowgate, Alnwick.

STANNINGLEY.—July 28.—For Bank Premises. Mr. H. Hodgson, Architect, 27 Kirkgate, Bradford.

SUTTON-IN-ASHFIELD.—July 28.—For Building School and Classrooms. Rev. J. H. Saxton, Victoria Street, Sutton.

THRYBERGH.—July 28.—For Rebuilding Church Tower and Spire. Mr. C. Hodgson Fowler, Architect, The College, Durham.

TILEHURST.—Aug. 3.—For Additions to Board School. Mr. F. W. Albury, 154 Friargate, Reading.

TONDU.—Aug. 7.—For Building House. Mr. G. K. Mills, Secretary, Paddington, W.

TOOTING.—July 31.—For Repairing Chimney-stacks at Fairfield House. Messrs. Lansdell & Harrison, 12 Compton Terrace, N.

TREDEGAR.—July 28.—For Caretaker's House and Board Room. Mr. C. Dauncey, Clerk, Castle Street, Tredegar.

TREHARRIS.—Aug. 17.—For Additions to Board School. Mr. John Williams, Architect, Morgantown, Merthyr Tydfil.

TREORKY.—Aug. 1.—For Building Grocer's Premises. Mr. J. Rees, Architect, Hillside, Pentre, Rhondda.

TUNBRIDGE WELLS.—July 27.—For Erection and Completion of Electric Light Station and Chimney Shaft. Mr. Arthur Ardion, F.R.I.B.A., 39 Victoria Street, S.W.

UPTON PARK.—For the Erection of Three Houses. Mr. S. Rees, 15 Rochester Road, N.W.

WEST VALE.—Aug. 7.—For Rebuilding Victoria Mills. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

WETHERBY.—For Building Church Schools. Mr. A. A. Gibson, Architect, 29 James Street, Harrogate.

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For Building Infants' School, for the Awsworth School Board. Mr. SAMUEL RICHARDS, Architect, Market Place, Ilkeston. Quantities by the Architect.

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W. E. Shaw, Ilkeston	2,300	0	0
J. & S. Shaw, Kimberley	2,216	0	0
J. Wheatley, Nottingham	2,115	0	0
Stubbs & Warner, Nottingham	2,112	1	0
G. E. Hardisty, Nottingham	2,100	0	0
T. Cuthbert, Hyson Green	2,059	0	0
B. Keeling, Nottingham	2,050	0	0
W. Donnelly, Kimberley	1,977	5	0
G. Youngman, Long Eaton	1,970	0	0

BECKENHAM.

For Making-up Marlow Road, for the Beckenham Local Board. Mr. J. A. ANGELL, Surveyor.

Mayo & Co., Brixton	£3,285	2	0
Fry Bros., Greenwich	3,220	19	4
A. F. Manuelle, Leadenhall Street	3,092	8	11
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Surveyor's estimate	2,840	0	0

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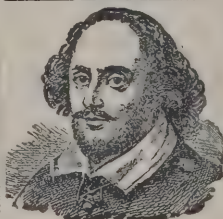
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R. Aitkenhead & Sons, Greenock	2,582	12	6
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Raworth & Allen, Harrogate, joiner	340	0	0
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Parker & Sharp, York	20,968	2	5
J. Neave, London	20,247	0	0
Graham & Son, Huddersfield	20,152	12	6
J. Moffatt, Manchester	19,829	19	0
J. Dickson, St. Albans	19,517	18	10
G. Osenton, Westerham	19,421	14	0
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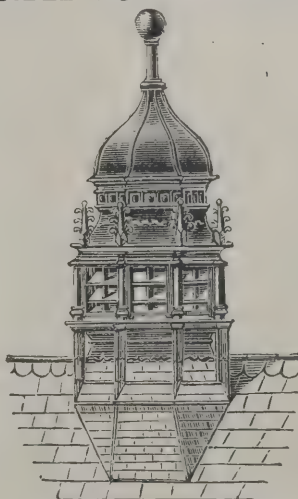
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For Erection of a New Classroom in Board School.

Thornton, Hailsham	£415	0	0
Buckhurst, Eastbourne	345	0	0
P. Harmer, Hailsham	340	0	0
Rich, Hailsham	325	0	0
C. HARMER, Hailsham (accepted)	303	10	0

LONDON.

For Rebuilding the London Apprentice Public-house, Old Street, St. Luke's, E.C. Mr. E. H. ABBOTT, Architect, 6 Warwick Court, High Holborn, W.C. Quantities by Mr. A. JOHNSON, Surveyor, 50 Imperial Buildings, Ludgate Circus, E.C.

J. O. RICHARDSON, Albert Works, Peckham (accepted) £6,382 0 0

For Erection of Buildings for the Brook Hospital, for the Metropolitan Asylums Board.

Section 1.—Scarlet Fever Pavilions A, B, C and D.

Higgs & Hill, South Lambeth	£40,400	0	0
G. E. Wallis & Sons, Maidstone	40,000	0	0
Leslie & Co., Kensington	39,965	0	0
J. Shillitoe & Son, Bury St. Edmunds	37,860	0	0
Kirk & Randall, Woolwich	37,650	0	0
W. Johnson & Co., Limited, Wandsworth	37,589	0	0
W. J. Adcock, Dover	36,050	0	0
C. Wall, Chelsea	32,652	0	0

Section 2.—Scarlet Fever Pavilions E, F, G and H.

Higgs & Hill	£41,000	0	0
G. E. Wallis & Sons	40,666	0	0
Leslie & Co.	40,614	0	0
Kirk & Randall	38,275	0	0
W. Johnson & Co., Limited	38,079	0	0
J. Shillitoe & Sons	38,000	0	0
W. J. Adcock	36,490	0	0
C. Wall	33,316	0	0

Section 3.—Isolation Wards and Workshops.

Leslie & Co.	£13,325	0	0
J. Shillitoe & Sons	12,900	0	0
C. Wall	12,713	0	0
W. Johnson & Co., Limited	12,370	0	0
H. Wall & Co.	12,347	0	0
Kirk & Randall	12,325	0	0

LONDON—continued.

Section 4.—Diphtheria Pavilions, &c.

Hall, Beddall & Co., Pitfield Wharf, S.E.	£39,997	0	0
G. E. Wallis & Sons	38,185	0	0
Leslie & Co.	37,597	0	0
J. Shillitoe & Sons	35,400	0	0
Kirk & Randall	35,346	0	0
W. Johnson & Co., Limited	34,688	0	0
C. Wall	30,347	0	0

Section 5.—Nurses' Home.

Leslie & Co.	£24,680	0	0
G. E. Wallis & Sons	24,590	0	0
H. Lovatt, Wolverhampton	24,370	0	0
Higgs & Hill	23,500	0	0
Kirk & Randall	23,168	0	0
W. Johnson & Co., Limited	23,095	0	0
G. Godson & Son, Kilburn	22,950	0	0
J. Shillitoe & Son	22,000	0	0
C. Wall	19,138	0	0

Section 6.—Portion of Administrative Block, Water Tower, Medical Superintendent's House, &c.

Leslie & Co.	£28,521	0	0
W. Johnson & Co., Limited	26,318	0	0
J. Shillitoe & Son	26,000	0	0
Kirk & Randall	25,951	0	0
C. Wall	23,095	0	0

Section 7.—Portion of Administrative Block, Laundry, Boiler-house, Steward's House, &c.

Leslie & Co.	£23,515	0	0
Kirk & Randall	21,601	0	0
W. Johnson & Co., Limited	20,963	0	0
C. Wall	20,898	0	0
H. Wall & Co.	20,400	0	0
G. Godson & Sons	20,109	0	0
J. Shillitoe & Son	19,750	0	0

For Construction of Roads and Sewers, for Mr. R. P. Tebb, Townley Park Estate, East Dulwich. Mr. F. A. POWELL, Surveyor, 344 Kennington Road.

MAYO & CO., Brixton Road (accepted) £1,240 0 0

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LONDON—continued.

For Erecting New Offices for all Departments of the Bolingbroke Road School, Old Battersea, and Providing a New System of Drainage.

H. King & Sons	£1,926	0	0
G. Foxley	1,760	0	0
J. Garrett & Son	1,714	0	0
L. Whitehead & Co.	1,670	0	0
E. Triggs	1,581	0	0
W. Hammond	1,572	10	0

For Refitting all the Offices in Connection with the Raywood Street School, Battersea, and Providing New System of Drainage.

Dent & Hellyer	£1,220	0	0
J. Smith & Sons	1,163	0	0
S. Polden	1,161	0	0
Holliday & Greenwood	1,117	0	0
L. Whitehead & Co.	1,110	0	0
W. Hammond	1,103	0	0
Holloway Bros.	1,084	0	0

For Providing New Offices for all Departments of the Lant Street School, Borough, and Providing a New System of Drainage.

W. Hammond	£1,500	0	0
T. L. Green	1,493	0	0
Garrett & Son	1,439	0	0
J. Marsland	1,395	0	0
G. Newton	1,316	0	0

For Enlargement of Board School, Lavender Hill, Provision of Laundry Centre and Schoolkeeper's House.

G. E. Wallis & Sons	£9,553	0	0
J. Shillitoe & Son	9,110	0	0
Holliday & Greenwood	8,649	0	0
Lathey Bros.	8,454	0	0
Holloway Bros.	8,474	0	0
J. & M. Patrick	8,463	0	0
J. Longley & Co.	8,343	0	0
S. & W. Pattinson	8,300	0	0
H. Lovatt	8,152	0	0
Stimpson & Co.	7,950	0	0

A. Extra if Brickwork in Cement.

LONDON—continued.

For Provision of a Cookery Centre, George Street School, Camberwell Road.

J. Garrett & Son	£1,352	0	0
A. Black & Son	1,313	0	0
J. & C. Bowyer	1,162	0	0
W. V. Goad	1,161	0	0
W. & H. Castle	1,051	10	0

For School for Special Instruction on the Hugh Myddelton Site, Clerkenwell, for the School Board.

W. M. Dabbs	£3,339	0	0
J. Grover & Son	3,320	0	0
Killby & Gayford	3,286	0	0
Staines & Son	3,226	0	0
W. Gregar & Son	3,207	0	0
C. Cox	3,112	0	0
J. & M. Patrick	3,106	0	0
E. Lawrance & Sons	3,090	0	0
N. Lidstone	2,974	0	0

For Provision of Cookery and Laundry Centres, Melvin Road, Penge.

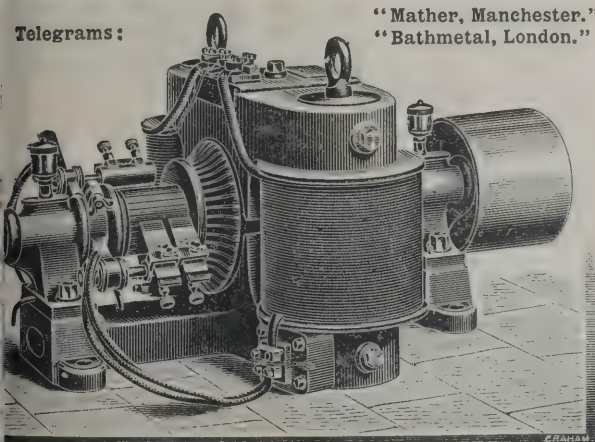
A. Black & Son	£1,952	0	0
J. Garrett & Son	1,802	0	0
G. H. Martin & Co.	1,775	0	0
M. Calnan & Co.	1,755	0	0
J. & C. Bowyer	1,744	0	0
H. Leney	1,693	0	0

For Enlargement of Board School, Colls Road, Peckham. Mr. T. J. BAILEY, Architect.

W. Downs	£6,791	0	0
Lathey Bros.	6,670	0	0
J. Longley & Co.	6,593	0	0
J. Marsland	6,548	0	0
F. & H. F. Higgs	6,541	0	0
Henry Lovatt	6,429	10	10
J. Smith & Sons	6,332	0	0
Holliday & Greenwood	6,193	0	0

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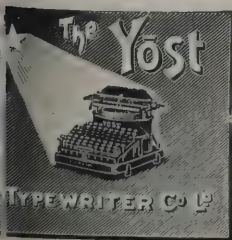
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LONDON—continued.

For Rebuilding the Offices in connection with all Departments of the Scrutton Street School, Shoreditch, and Providing New System of Drainage.

T. H. Jackson	£1,450	0	0
S. Polden	1,390	0	0
Dent & Hellyer	1,230	0	0
Lawrance & Sons	1,195	0	0
Knight & Son	1,195	0	0

For Providing and Fixing a Complete System of Low-pressure Hot-water Apparatus for Warming the Hughes Fields School, Deptford.

Fraser & Fraser	£536	0	0
C. P. Kinnell & Co.	530	0	0
Z. D. Berry & Sons	518	0	0
W. H. Wharton	490	0	0
W. G. Cannon	488	12	0
Maguire & Son	467	8	0
Wenham & Waters, Limited	450	0	0
J. C. & J. S. Ellis	419	10	0

For Refitting Boys and Girls' Offices, Alton Street School, Bromley, with Stoneware Troughs and Automatic Flushing Tanks, for Enlarging and Refitting the Infants' Offices, and Providing New System of Drainage.

Knight & Son	£1,119	0	0
G. Parker	980	0	0
J. T. Robey	947	0	0
G. Newton	877	10	0
Johnson & Co.	850	0	0
W. & H. Castle	816	0	0

For Enlargement of Lillie Road School, Fulham.

R. A. Yerbury & Sons.	£5,489	0	0
W. King & Son	4,887	0	0
Foster & Dicksee	4,708	0	0
E. Lawrance & Sons	4,610	0	0
J. & M. Patrick	4,539	0	0
J. Smith & Sons	4,537	0	0
Stimpson & Co.	4,430	0	0

A. Extra if Brickwork in Cement.

LONDON—continued.

For Provision of a Cookery Centre, Park Walk School, King's Road, Chelsea.

W. King & Son	£868	0	0
G. & F. Kent	822	0	0
F. T. Chinchin	758	15	9
F. Gough & Co.	760	0	0

A. Extra if Brickwork in Cement.

For Supplying and Refitting Tubes to the Heater in "B" Block of their Infirmary, St. John's Hill, New Wandsworth, for the Guardians.

J. Phillips & Co.	£85	0	0
Davis's Gas Stove Company	85	0	0
Parsons & Harris	76	0	0
H. S. Lee	74	5	0
C. Bevan	73	0	0
R. S. Ronald	73	0	0
Z. D. BERRY & SON (accepted)	72	0	0

For Repairing, Painting, Whitewashing, &c., the Interior, and Painting the Exterior and Ironwork, and other Works, at the Workhouse, Parish Street, and the Infirmary and Casual Wards, Rotherhithe, for the Guardians of the St. Olave's Union. Messrs. NEWMAN & NEWMAN, Architects, 31 Tooley Street, London Bridge.

Proctor, Woolwich	£2,330	0	0
Pritchard & Renwick, Tooley Street	2,200	0	0
Mills, Westcombe Park	2,179	0	0
Vegor, Poplar	1,908	0	0
BULLERS, Bermondsey (accepted)	1,840	0	0

For Rebuilding the Royal George Tavern, New Street, Kennington Park Road, S.E., for Mr. C. Dick. Messrs. F. J. EEDLE & MEYERS, Architects, 8 Railway Approach, London Bridge, S.E. Quantities by Mr. H. DOW WHITE, 52 Finsbury Pavement, E.C.

Gould & Brand	£3,148	0	0
C. Ansell	3,091	0	0
J. Marsland	3,085	0	0
Dearing & Son	3,080	0	0
Whitehead & Co.	3,070	0	0
J. Tyerman	3,050	0	0
Burman & Sons	3,045	0	0
Avis & Co.	2,980	0	0
Rider & Sons	2,975	0	0
Spencer & Co.	2,915	0	0
YOUNG & LONSDALE (accepted)	2,887	0	0



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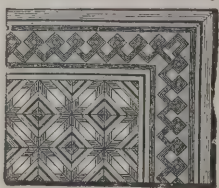
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Turpin's Patent.
5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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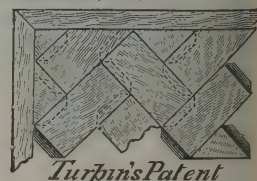
MARBLE

MOSAIC

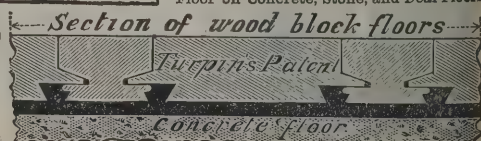
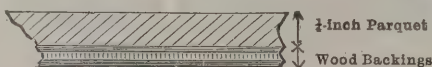
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NANTWICH.

For Building Mortuary, Additional Tramp Wards and Alterations to Closets, for the Guardians. Mr. J. A. DAVENPORT, Surveyor, 152 Hospital Street, Nantwich.

N. H. Hulse, Winsford	£333	0	0
S. Manley, Aston Menbury	312	5	0
J. Matthews, Nantwich	298	0	0
J. T. Gresty, Willaston	272	10	0
J. HARDING, Nantwich (accepted)	247	10	0

NEWRY.

For Building Intermediate School Buildings and Master's Residence, Newry.

D. Neary	£2,298	0	0
A. WHELAN (accepted)	2,128	0	0

PETERBOROUGH.

For Building Offices, corner of Queen Street, Peterborough, for Messrs. Rippon & Co. Mr. JAMES RUDDLE, Architect, Boroughbury, Peterborough.

Furnis, Peterborough	£369	0	0
Bridgfoot, Peterborough	355	0	0
Sibley, Peterborough	350	0	0
Machin, Peterborough	342	0	0
Wenlock, Peterborough	336	14	0
Gray, Peterborough	329	0	0
Guttridge, Peterborough	323	0	0
NICHOLS, Peterborough (accepted)	303	0	0

For Alterations, Repairs and Drainage of the Gaol Building, Peterborough. Mr. JAMES RUDDLE, Architect, Boroughbury, Peterborough.

Swain, Peterborough	£288	0	0
Guttridge, Peterborough	273	0	0
Machin, Peterborough	263	0	0
WENLOCK, Peterborough (accepted)	244	0	0

PLYMOUTH.

For Footpaths in Beaumont Park. M. JAMES PATON, Borough Engineer, Plymouth.

Tozer & Son	£548	18	10
T. Shaddock	391	0	0
C. L. DUKE (accepted)	329	15	0

REIGATE.

For Pipe Sewers and 933 Lineal Yards of 9-inch Internal Diameter, together with Junctions, Manholes, Ventilators, Cast-iron Rising Main Pipe, Construction of Brick-built Sump and Engine-house. Mr. FRED. DIXON CLARK, Engineer.

H. Roberts, Sandwich	£2,505	10	6
G. S. Faulkner, Reigate	2,292	10	0
J. Neave, Forest Hill	2,242	0	0
W. Cunliffe, Kingston-on-Thames	1,996	1	10
W. Coker, Malling, Rochester	1,932	0	0
J. Jackson, Plaistow	1,775	0	0
Engineer's estimate	2,044	8	0

* Recommended for acceptance.

SHEPPERTON.

For Building Dwelling-house at Littleton, Shepperton, for Mr. George Bravington. Mr. CHARLES WELCH, Architect, London Street, Chertsey.

F. B. Pitcher, London	£1,512	7	0
H. Dee, Walton-on-Thames	1,467	0	0
Gray, Egham	1,257	0	0
R. J. Hunt, Chertsey	1,250	0	0
J. Martin, Addlestone	1,247	0	0
B. Ingram & Co., Hersham	1,245	10	0
H. G. Nesmyth, Chertsey	1,245	0	0
T. KNIGHT & SON, Chertsey (accepted)	1,224	0	0

STOCKPORT.

For Sewage Outfall Works, Stockport. Mr. A. M. FOWLER, Engineer.

Contract No. 3.

Kellett, Manchester	£26,421	16	11
Byrom, Woolford, Bury	25,041	6	10
B. Morton, Manchester	22,365	0	0
T. & W. Meadows, Heaton Norris	20,360	0	0
Engineer's estimate	21,000	0	0

WEST ARDSLEY.

For Building Four Houses, &c., at West Ardsley, for Mr. C. Messenger. Mr. T. A. BUTTERY, Architect, Queen Street, Morley.

Accepted Tenders.

J. T. Bullock, East Ardsley, mason	£497	10	6
Lyles & Smith, Dewsbury, joiner	171	10	0
E. Wilson, Morley, plasterer	52	10	0
Sharp & Harper, Leeds, slater	39	25	0
W. H. Jackson, Morley, plumber	15	10	0

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GAS
KITCHENERS.

GAS OR COKE
GRILLERS.

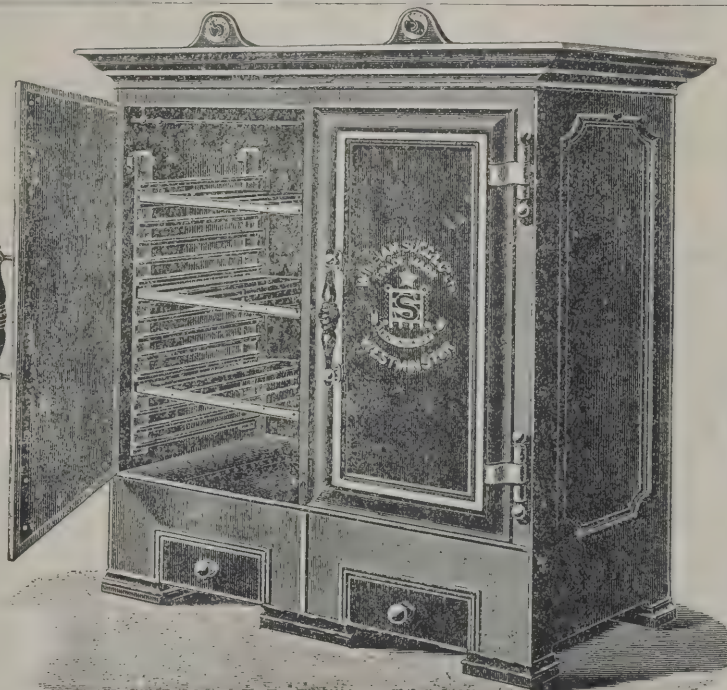
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PASTRY OVENS.

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COMBINED WITH ECONOMY IN FUEL.

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ALL KINDS OF IMPROVED APPLIANCES FOR COOKING BY
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WILLIAM SUGG & CO.

Vincent Works, Westminster, S.W.: 1 and 2 Grand Hotel Buildings, Charing Cross, W.C.;
1a Ludgate Hill, E.C.; 33 Bold Street, Liverpool, &c.

TORQUAY.

For Building Dwelling-house and Offices adjoining Kent's Road, Torquay. Mr. E. RICHARDS, Architect, Manor Office, Torquay.

J. Smerdon, Torquay	£1,394	0	0
G. K. Smale, Torquay	1,370	0	0
R. F. Yeo, Torquay	1,324	0	0
Vanstone & Mumford, Torquay	1,295	0	0
J. M. McKellar, Torquay	1,245	0	0
W. A. Goss, Torquay	1,212	0	0
S. Pack, Torquay	1,179	10	0
S. Blatchford, Torquay	1,131	16	0
J. Chubb, Torquay	1,090	0	0
C. Cocks, Ilsham	948	0	0
S. J. Trethewey, Torquay	943	0	0
W. BRENTON, Torquay (accepted)	876	10	0

WITHINGTON.

For 1,850 Yards of Wrought-iron Fencing, for the Local Board. Mr. A. H. MOUNTAIN, Surveyor.

G. Chiles, Burgess Hill	£632	6	1
W. T. Burbidge, Leicester	627	0	0
E. Foreshaw & Son, Warrington	613	4	0
W. L. Sharpe, Grimsby	596	0	5
Taylor & Ryder, Manchester (late)	566	3	0
Princess Metal Works, Manchester	562	4	9
Bruce & Still, Liverpool	559	4	7
Johnson Bros., London	551	2	4
Rowland Bros., Bletchley	542	14	0
G. B. Smith & Co., Glasgow	531	1	0
Hydes & Higfull, Sheffield	531	5	5
Staffordshire Bolt Company, Darlaston	531	4	11
Blakeley & Pickering, Ravensthorpe	527	5	0
H. Luke, Manchester	505	5	8
F. Morton & Co., Garston	503	11	5
Hill & Smith, Brierley Hill	496	15	3
W. Hayward & Sons, Wolverhampton	496	3	9
T. W. Palmer & Co., London	484	11	4
J. Mountford & Co., Manchester	470	9	6
W. H. Wharton, Chesterfield	469	9	0
Bayliss, Jones & Bayliss, Wolverhampton	452	1	6
Wilkes, Limited, Darlaston	439	7	8
E. J. RAYBOULD & Co., Workington (accepted)	421	1	5

ILLUSTRATIONS.

MONUMENT TO LORD PRESIDENT INGLIS.—ST. GILES'S CATHEDRAL, EDINBURGH.

SHIREOAK, HEADINGLEY.

THE OLD GARDENS, HEADINGLEY.

BUILDING AND BUILDERS.

THE asylum committee of the West Sussex County Council announce that the Secretary of State has approved of the plans prepared by Sir A. W. Blomfield, A.R.A., for the asylum at Horsham, and that the preparation of quantities is being carried out with all possible expedition.

THE work in connection with the erection of the new church at Gretna has been commenced on an open elevated site of a quarter of an acre of ground at the corner of four roads between Gretna Green and Springfield, to accommodate over 200 persons. It is being erected from designs prepared by Mr. T. Taylor Scott, architect, Carlisle. The contractors selected for the various trades are:—Mr. James Rae, builder, Ecclefechan; Mr. A. Tweedie, joiner, Annan; Messrs. Millar & Son, plumbers, Annan; Mr. McCulloch, painter, glazier and decorator, Annan; Mr. C. J. Nanson, slater, Carlisle; and Mr. W. Norman, plasterer, Carlisle.

AT the meeting of the Feckenham School Board sketch plans were submitted by Mr. J. Johnson, architect, for the enlargement of Crabb Cross Schools.

CHRIST CHURCH, Rotherhithe, is to be restored and re-seated, under the superintendence of Messrs. Newman & Newman, F.R.I.B.A., of Tooley Street, London Bridge.

WE hear that Messrs. Newman & Newman, F.R.I.B.A., of Tooley Street, London Bridge, are the architects for the new Mendham Memorial Schools, to be built in Emmanuel Parish, Hastings, for the Rev. Sholto Newman.

THE Hertford and Ware Joint Hospital Board have instructed Messrs. Newman & Newman, F.R.I.B.A., of Tooley Street, London Bridge, to prepare plans for the Isolation Hospital to be built at Gallows Hill.

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TRADE NOTES.

THE Paisley Water Commissioners have accepted the offer of Mr. James Urquhart, Shawlands, for the construction of the new filters at High Craigenfeoch, amounting to 4,685*l.* 19*s.* 10*d.* The offer of Mr. R. B. Stewart, Beith, for the cutting of the pipe track, was also accepted at 1,423*l.* 9*s.* 7*d.*

THE new Board Schools, Lower Gornal, near Dudley, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

AN inquiry has been held at Buxton Town Hall respecting an application of the Local Board to borrow 5,000*l.* for the provision of a cemetery, and 1,900*l.* for extension of sewage precipitating tanks. The land for the cemetery consists of twelve acres on the Ashbourne Road, at a cost of 1,200*l.*

THE attention of architects and of all interested in School Board work is called by Messrs. Emley & Sons, Limited, Steam Marble Mills, Newcastle-upon-Tyne, to the growing demand for McMath's patent wash-hand troughs. These are specially in favour in Scotland, where they have been fully tested, and found to be the most efficient lavatories in the market. Among the schools in which they have been recently fixed the following may be mentioned:—Queen Mary Street School, Glasgow; Centre Street School, Glasgow; Thomson Street School, Glasgow; Dalmarnock Road School, Glasgow; Springfield School, Glasgow; Abbotsford School, Glasgow; Adelphi Street School, Glasgow; Galashiels School, Galashiels; Cambuslang School, Cambuslang; Beckford Street School, Hamilton; Row Board School, Helensburgh; Motherwell School, Motherwell; Wishaw School, Wishaw; Hetherston School, Maryhill; Tarbrex School, Cobbinshaw; Coatbridge School, Coatbridge; Dunniker School, Kirkcaldy; Boundary Lane School, London; school at Nottingham; school at Manchester; school at Swansea; Fairfield School, Govan; school at Irvine; school at Abroath; school at Paisley; school at Carlisle; school at Gateshead.

A NEW illuminated turret clock, showing the time upon four external dials and striking the hours, has just been completed at the Accomb new Board schools, near York, for the Accomb School Board, by Messrs. Wm. Potts & Sons, clock manufacturers, of Guildford Street, Leeds, and 22 Collingwood Street, Newcastle-on-Tyne, who are also making one for the Leeds School Board for Hunslet new school, and large clock and chimes for Hayfield Church, near Stockport, and South Kirkby Church, near Wakefield.

MESSRS. KELLEY & CO., artists in stained-glass, 5 Bunhill Row, E.C., desire us to state that although they were burnt right out, and had lost everything in the recent fire in Tabernacle Street, they have got new premises, resumed work, and re-executed the whole of the orders they had in hand, which were destroyed by the fire.

THE following most satisfactory testimonial was received by Mr. Charles D. Phillips, of Newport, Mon., from the clerk of works to Earl Nelson:—"Herewith please find order for 2,000 lock-jaw tiles and ridge. I purchased some from you for a very exposed roof in 1887, and I am pleased to say they have stood all weathers well and keep out both snow and rain, which the plain tiles I removed to place them did not. I am erecting a new building, when I intend using the enclosed order."

MESSRS. PERKEN, SON & RAYMENT, manufacturing opticians, 99 Hatton Garden, so well known for their "Optimus" lenses and appliances, have just now issued from the press the fifth edition of their "Beginner's Guide to Photography." Each edition has comprised 8,000 copies. This last is brought up to date, treating of the most modern apparatus as well as the most recent developers, papers, &c. The manual cannot be too highly recommended for beginners, and, in addition, it is a handy book of reference for formulae, &c., for the advanced practitioners of photography.

WE are pleased to notice the introduction of the Trinidad asphalt pavement into London by the Trinidad Lake Asphalt Paving Company, Limited, 2 Crosby Square, London. The company have already obtained a contract for the paving of Pelham Street in Kensington, which will give ample opportunity to the London paving authorities to judge of the merits of the pavement. The standard pavement of America, now exceeding 1,000 miles of roadway, is made with this material; it is durable and non-slippery. All the great asphalt paving companies of America use it. In Europe it is used in all pavements that are laid in mastic asphalt. It is largely used for cellars, warehouses, mills, maltkilns, breweries, silos, laundries, engine-houses, foundations for high-pressure engines to prevent vibration, stables, tennis-courts, rinks, &c. Flat roofs are rendered fireproof and waterproof by its use. Felt roofing manufacturers were amongst the earliest to utilise the material. Bitumen made from Trinidad Lake asphalt furnishes one of the finest cements known, and can be applied to almost any purpose, from the construction of sea walls to a solution for

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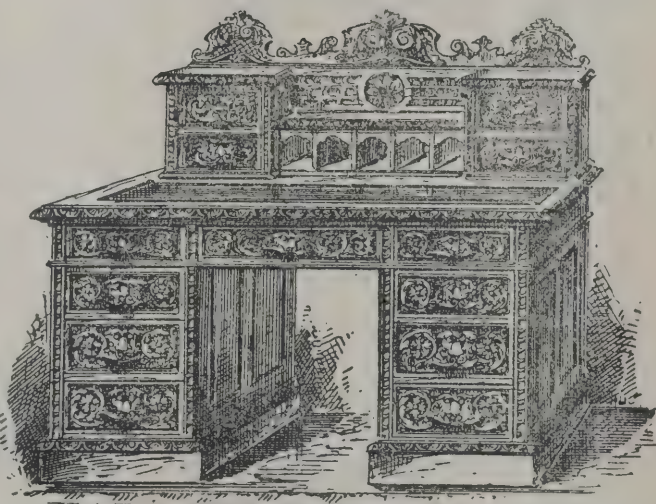
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parquetry. Several patented processes in which Trinidad bitumen largely enters are now extensively used, both for insulating electrical conductors and in constructing the conduits holding same. Bitumen concrete conduits may be said to be the standard system for electric light distribution in London. The damp-resisting properties of the material have rendered it valuable in the construction of bridges, tunnels, railway arches, reservoirs, waterworks, conduits of all sorts, coating for iron pipes, sewers, drains and various sanitary works. It is a deodorant, an antiseptic, a preservative, impervious to acids and elastic.

MESSRS. C. G. WOOD & CO., of 104 High Holborn, London, W.C., have just accepted an agency for London and district from Messrs. O'Connor & Co., Limited. O'Connor's patent hinges and O'Connor's patent pipe joints and ventilating radiators will be kept in stock.

VARIETIES.

AT yesterday's sitting of the Lords' committee on the Tower Bridge Bill, Mr. Baumann, on behalf of the owners of property affected by the betterment clause, moved the insertion of a clause compelling the arbitrator in fixing the betterment charge to allow for any "worsement" caused by the alteration in the value of any property belonging to the same owner, whether such property happened to be inside or outside the area alleged to be bettered by the improvement. This amendment was strongly opposed by the Council as regards property outside the area. The committee, however, decided to insert the amendment.

AT Beltinge, Kent, a subsidence of land has occurred, about an acre, including a public roadway, having sunk to a considerable depth. Other small landslips have occurred in this vicinity from time to time, but this is the most serious. So far the safety of dwelling-houses in the neighbourhood has not been affected.

THE Barnsley School Board have received sanction to borrow 3,841*l.* for works at the Keir Street School.

THE Darton Local Board recently commissioned Mr. W. H. Radford, Nottingham, and Messrs. Duncan & Pickard, Leeds, to prepare schemes of drainage and sewage disposal for the townships of Darton, Kexborough and Barugh. The Board have decided to adopt the scheme sent in by Messrs. Duncan & Pickard, who have been appointed the engineers to

carry out the works of drainage and disposal of sewage. The system of purification is that known as the "Carbonised Refuse System," combining therewith the disposal of towns' refuse (Jagger's patents).

THE *Birmingham Post* says:—Last week the Walsall borough surveyor (Mr. Middleton) received an offer of the surveyorship of Hornsey, near London, with a commencing salary of £500 a year, and there was a fear that his service would be lost to the town. It is stated, however, that the general purposes committee have made arrangements which will probably result in his remaining at Walsall.

AT the meeting of the insaniary property committee of the Liverpool Corporation, it was intimated that the Local Government Board had approved of the obtaining of a loan of 25,000*l.*, which is to be applied to the demolition of insanitary property in the city.

IN connection with the sewage works of Bolton, at a meeting of the committee the engineer, Mr. H. L. Hinnell, reported the result of an interview with Lord Derby's agent respecting the proposed purchase of land for the purpose of carrying out the filtration scheme. It was stated that terms had been arranged for the purchase of Rhodes Farm, Ringley, which covers an area of about 140 acres. The work will be commenced as early as possible after receiving the sanction of the Town Council, and it has been decided to apply to the Local Government Board for sanction to borrow 75,000*l.* for the purpose of the undertaking.

ON August 2 Messrs. Glasier & Son will sell by auction at the Mart, E.C., a valuable freehold property known as the Thorney House Estate, situate in Kensington main road, at the corner of Palace Gate, between the Albert Hall and Kensington Palace, and facing the Board Walk, Kensington Gardens, and comprising an area of nearly 40,000 square feet, and Thorney House, a beautiful detached mansion in Tudor style. The frontages are 446 feet in length, and the ground could be at once utilised for building purposes without disturbing the present house and its gardens. The property can be seen on Tuesdays, Thursdays and Saturdays between two and five o'clock.

IN connection with the annual meeting of the Wilts "Archæological Society at Marlborough, the president, Sir Henry Bruce Meux, has engaged workmen to make a cutting or cross section through the mound or vallum encircling Avebury, with the object of determining the period of its erection. The excavations will occupy about a month.

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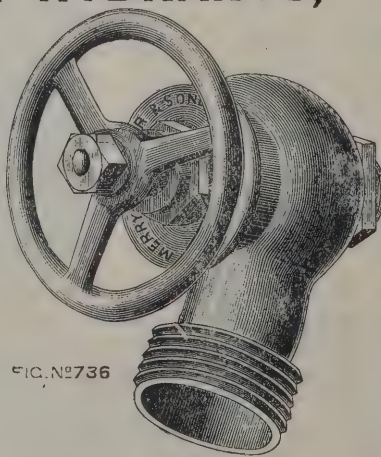


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GOLD MEDAL, Inventions Exhibition, 1886.

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THE Norwich Town Council have voted a gratuity of 200 guineas to Mr. Buchan on his retirement from the city surveyorship owing to ill-health. It transpired at the meeting also that Mr. Buchan had sent in his resignation without claiming his right for three months' salary.

AUGUST BANK HOLIDAY ON THE CONTINENT.

THE Hook of Holland route to the Continent offers exceptional facilities for visiting Holland and Germany. Passengers leaving London at 8.30 any evening, Sundays included, and Parkston Quay, Harwich, at 10.15 P.M. the same day, by one of the Great Eastern Railway Company's fine twin-screw steamers, are due at Amsterdam, the Hague and the chief Dutch towns early next morning. For the Antwerp Exhibition cheap weekly return tickets will be issued, and should the traffic require it, a second steamer will be run on Thursday, August 2, and Saturday, August 4. Passengers leaving Liverpool Street station at 8.30 P.M. every weekday are landed in Antwerp early the next morning close to the exhibition; and as the last four hours of the voyage are spent in steaming up the river Scheldt, they can breakfast comfortably on board. The steamers leave Antwerp at 6.45 P.M. every weekday, and *table d'hôte* is served on board during the passage down the Scheldt. The General Steam Navigation Company's steamers will leave Harwich at 10.30 P.M., August 1 and 4, and return from Hamburg August 5 and 7.

WOOD v. ASPHALTE.

At a meeting of the Commissioners of Sewers of the City of London, as reported in the *City Press*, it is stated that Mr. Burmester submitted a report from the streets committee on the question of repaving Upper Thames Street, and recommending that one portion of the said thoroughfare, viz. from London Bridge to Queen Street, should be paved by way of trial with Australian wood at an estimated cost of about 2,600*l.*, and that the question of repaving the remainder of the thoroughfare should be adjourned to try the effect of the experiment. Mr. Gordon moved as an amendment that the thoroughfare in question should be paved with asphalt at an estimated cost of 2,400*l.* Mr. Gordon said that wood was objectionable at that point in consequence of its absorbent

nature. Mr. Wallace having seconded the amendment, and concurred with the remarks made by the mover, the medical officer was called upon to give his opinion on the relative merits of wood and asphalt paving. Dr. Sedgwick Saunders said that, after 21 years' experience in the matter, he was still of the opinion that the only clean and useful pavement for the City streets, having regard to sanitation alone, was asphalt pavement. Wood, in his opinion, was about the worst pavement ever invented. As far as Thames Street was concerned, he had often reported on its condition, and he repeated that the only way to improve the sanitary condition of the street was to lay down a hard and jointless pavement. After a desultory discussion on the relative merits of wood and asphalt, in which Mr. Deputy Edmeston, Mr. McCarthy, Mr. Sayer, Mr. Cloudsley, Mr. Berridge and Mr. Deputy Bowring joined, Mr. Gordon's amendment was put to the meeting and carried.

THE LONDON COUNTY COUNCIL.

THE annual address of Sir John Hutton, the chairman of the London County Council, was delivered on Tuesday, July 25. In the course of it he said the building act committee has largely increased, and must necessarily increase with the extension of buildings in London. No less than 6,286 cases of dangerous buildings were dealt with last year. Regulations have been made whereby the height of hoardings used for advertising purposes around vacant land has been restricted to 12 feet. I wish, instead of the hoarding for advertising purposes round vacant land, owners would follow the practice of the Council, the Commissioners of Sewers and a few large owners of land, and erect a palisade fence and prohibit bill-sticking. The matter is of less moment when building operations are in progress. Then, at least occasionally, we have the pleasure of seeing an elegant and artistic building emerging into view when the ugliness of the street hoarding is removed. But to be obliged from one year's end to the other to have before one's eyes the vulgarity and untidiness of a street advertising hoarding is a thing too terrible to contemplate. The duties of the committee with regard to the formation of streets, the naming and numbering of houses, and the thousand-and-one responsibilities devolving upon them have been discharged with skill and despatch. Two hundred and forty-seven sky-signs have been taken down, and 169 licenses for sky-signs have been granted for the limited period defined by the Act.

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One ingenious evasion of the Act has been frustrated, so that those of us who desire to see London less ugly in the future regard this little measure as a useful aid to the realisation of our wishes.

The highway committee is proceeding to formulate a scheme for the electric lighting of the Thames Embankment. I am glad the Council prevented the permanent disfigurement of that noble thoroughfare by refusing to allow lamp standards to be erected in the centre of the road, and I hope that it will not hurry to adopt lamp standards to be erected on the kerb without good advice and mature consideration as to their design and suitability.

The list of improvements in the hands of the improvements committee, either completed or in progress, includes the four bridges at the Isle of Dogs; Evelyn Street to Creek Road, Deptford; St. George's Place, Knightsbridge; Fulham Palace Road and Queen Street, Hammersmith; Fortress Road, Kentish Town; and Sandy's Row, Bishopsgate, a northern approach to the Tower Bridge. With regard to the southern approach to the Tower Bridge, the insistence upon the application of the betterment principle has delayed this improvement. In the opinion of the Council it is especially a case in which betterment should be made to apply. The Council is quite consistent in its action in refusing to execute the improvement until the principle is admitted by Parliament. Three improvements are mentioned in the report as suggested by the committee, but not agreed to by the Council, and as they stand at an estimated net cost of 2,400,000l., we have not far to seek for a reason for the Council's disagreement. If the rates are to go up by leaps and bounds, and the ratepayer is willing to stand it, then improvements can be conducted upon the old lines to any extent the Council may determine. But are the ratepayers willing to pay all the cost of practically limitless improvements? I think not. Upon this matter they will so soon have an opportunity of speaking that the Council has, in my opinion, done well in restricting its improvements to comparatively small matters, seeing it is no fault of the Council that it has not obtained other sources of revenue.

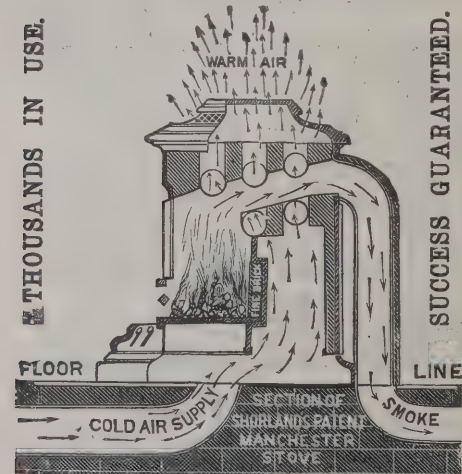
The water committee have not made much progress in the settlement of the water question. The report of the Royal Commission is of the most unsatisfactory and conflicting character, and the more one knows of the subject the more difficult does it appear to agree with the feelings of the Commission upon many important branches of the question. The appropriation of more water from the Thames, instead of

affording a permanent settlement of the London water question, only postpones the grappling with it a few years, when every difficulty with which the question is now surrounded must be enormously increased. The parliamentary committee is now proceeding to draught Bills, in conference with the water committee, dealing with the acquisition of the undertakings of the present water companies upon fair and reasonable terms, as a step to the equipment of the Council for the discharge of the responsible duty of being the water authority in London.

During the past year some 55,000l. worth of work has been executed and about 180,000l. worth is being proceeded with. The freehold of the central works in the Belvedere Road has been acquired, and new workshops are in course of erection, together with offices, stables, boiler-house and engine-house. It has been found necessary to obtain premises at Princes Street, Walworth, and at Norman Road, Greenwich. The committee are also in negotiation for the purchase of a portion of the land at the south-western corner of Battersea Bridge. Forty-five horses and cobs have been purchased, together with a large quantity of working plant. With regard to the quality of the work done, there are few persons who complain of it. With regard to the cost of such work, some people think that there is more to be said. But are we, as a public body, unwilling to put anything to the credit of quality? Or do we take this position, that while insisting upon quality we at the same time insist upon cheapness? Now, it seems to me that it is impossible to gain both ends, and my preference would be given for the good work—not, of course, with total disregard to cost, but with a due appreciation of the fact that cheapness and excellence are seldom compatible. The one danger and probably the only danger which the works committee has to fear—apart from captious criticism which it can safely refute—is that the workman may not be disposed to do as good work for the Council as for a contractor. Now, if that is so, it is little short of suicide on the part of the workman. I never have understood that the workman was so enamoured of the contractor as to wish to do fairly by him and him only, and I have yet to learn that the British workman will allow the grandest chance that labour has ever had in London to slip through his fingers. It is not improbable that out of 1,700 workmen there may be some who imagine themselves very clever in gaining a temporary advantage by the course I have suggested. Personally I have too much confidence in the workman to think that any such result will follow, and I believe that the works committee will not only justify its

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LAYING PIPES.

A CASE has been tried in the Brighton County Court which turned mainly on the question what is a reasonable price for laying drains. The plaintiff, Mr. Langbridge, of Croydon, sued Mr. E. Broadbridge for 25*l.* 7*s.*, work done and materials supplied. Defendant, while denying liability for the full amount, paid 18*l.* 12*s.* 6*d.* into court. Counsel said the work was done in February of last year, and consisted of the connection of six houses in Bolnore Road, Hayward's Heath, with the main sewer. The plaintiff's case was that 156 feet of 6-inch Stanford's patent pipes were laid and jointed, the average depth being 18 feet, and 3*s.* 3*d.* per foot was charged, while the defendant, in paying into court, had calculated 149 feet at 2*s.* 6*d.* a foot. The questions were, first, as to the liability of defendant, and secondly whether the plaintiff's measurements were correct, and whether a proper charge was made per foot.

The plaintiff, a contractor, said in February last year he was constructing a sewer at Hayward's Heath for the local sanitary authority. In consequence of a communication from Mr. Beach, the Local Board's surveyor, he did the work sued for. The soil at Hayward's Heath was a bad one to work in. For 12-inch pipes he was paid 4*s.* 8*d.* per foot by the Local Board, and making allowance for the different cost of pipe, this would work out at 3*s.* 11*d.* for the 6-inch pipe. Mr. Broadbridge declining to recognise his claim, witness asked him if he did not authorise Mr. Beach to have the work done. Defendant replied that he did not know; that the price was too much; that he had an offer to do the work at 1*s.* 6*d.* a foot, and that Mr. May, the Brighton surveyor, told him 2*s.* was plenty to pay per foot.

A brother of the plaintiff, who acted as foreman of the job, deposed to the measurement of the pipes.

Mr. Holman, contractor, Brighton, said he thought 4*s.* a foot would have been a fair price for the work.

Mr. Stone, contractor's agent, said he considered 3*s.* 9*d.* per foot would have been a fair price.

Mr. Nottle, builder, Croydon, said he generally got a little more for such work than the prices that had been mentioned.

Mr. Sawyer, a builder's foreman, described the plaintiff's charge as a low one.

Mr. Beach, surveyor to the Hayward's Heath Local Board, said he met defendant at Hayward's Heath while the main sewer was being laid, and recommended him to have the drains laid to his property while the work was in hand, as they could then be laid at a more reasonable price. Mr. Broadbridge then authorised him to instruct the contractor to do the work.

In cross-examination he said he thought that 2*s.* 6*d.* a foot would be a proper price. His measurement of the drains worked out at 149 feet. Part of this measurement was over the surface, but in that case he had made some allowance for the fall.

For the defence, Mr. Arthur Loader, architect and surveyor, Brighton, said, taking the facts as he had heard them, and considering that the main drain was open, he thought 2*s.* 6*d.* per foot ample.

Mr. Clayton Botham, surveyor, said he thought it might have been done for 2*s.* 3*d.*

Luther French, pipe-layer, said he could do the work for 2*s.* 3*d.* per foot.

Mr. Gold, drainer, thought 2*s.* 6*d.* a fair price.

The defendant was also called, and said he understood at the time that Mr. Beach was going to quote a price for the work before it was done.

His Honour found that the defendant was liable for the amount, but thought that there was an understanding that a low price was to be charged for the work. He considered that the amount paid into court was sufficient to meet the claim, and gave judgment for the defendant, with costs.

HACKNEY MARSH.

ON Saturday Sir John Hutton, chairman of the London County Council, dedicated Hackney Marsh to public use. The marsh is 337 acres in area. The Council have already decided to make a series of improvements which, it is hoped, will effectually prevent the flooding of the land which annually takes place during the wet seasons. Four new canals will be cut connecting the sharp bends of the old river, and suitable embankments will be erected. This will have the effect of converting a portion of the marsh into a large lake studded here and there with islands. These will be suitably planted,

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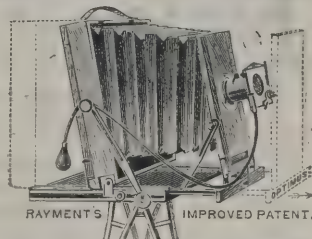
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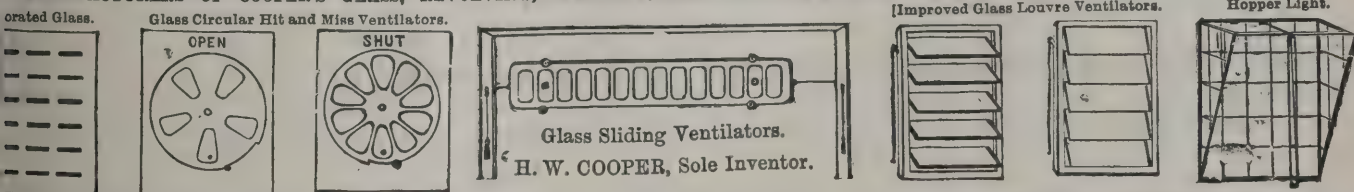
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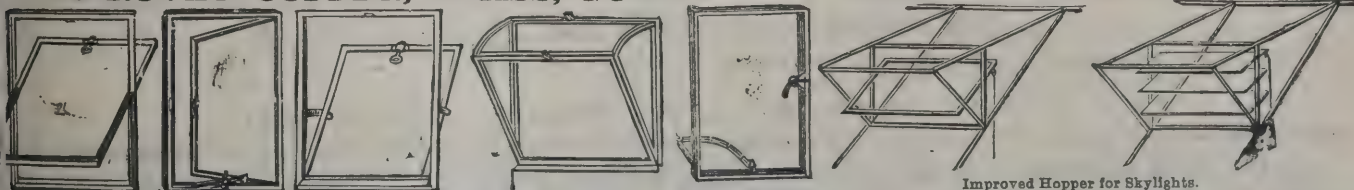


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and will, it is hoped, form one of the most attractive features of the river. It is stated, in a history of the marshes which has been prepared by Mr. John J. Sexby, that the first mention of the marsh in history was in the reign of Alfred the Great, when the Danish Vikings sailed up the Thames and ascended the Lea (then at high water often a mile wide) as far as Ware, in Hertfordshire. Here they built a fortified camp, and sacked the town and adjacent villages. Attempts made by the citizens of London to dislodge the foe proving ineffectual, the king ordered channels to be cut on Hackney Marshes by which the current of the river was diverted, and, the stream being thus rendered shallow, the Danish vessels were left aground miles away from the Thames. Traces of these channels are still to be found in the vicinity of the Temple Mills, and a Danish canoe found near the spot is preserved in the British Museum. Traces have also been found of a Roman highway across the marsh. The marsh is situated in the manor of Lowshold, one of the two divisions into which the Lordship of Hackney was divided. In 1290 Edward I. granted "free warren in this district" to the Bishops of London, but in the reign of Edward VI. Bishop Ridley surrendered the manor to the king, who presented it to his Chamberlain, Lord Wentworth. The land continued in the possession of the Wentworths until its confiscation in 1652. In 1697 it passed into the possession of the Tyssen family. Among the interesting buildings on the land are the Temple Mills at the south-eastern extremity of the marshes, which were originally erected and maintained by the Knights Templars. After the dissolution of that order they became the property of the Knights of St. John of Jerusalem. Near by is the White Hart, an ancient hostelry, said to have been erected in 1513, which still stands open for refreshment, and here a toll-bar—one of the very few survivals of the kind—levies a charge of 2d. on every horse. Another interesting building is the White House public-house, situated in an isolated position in the middle of the marshes.

The Earl of Meath, chairman of the Metropolitan Public Gardens Association, explained the initial steps which had been made to secure the marsh. In September, 1890, the Board of Agriculture issued a draft scheme for the regulation of the marshes, and signified to the Association its intention to hold an inquiry, which was opened at the Hackney Town Hall on December 1, 1890. The London County Council, through its counsel, objected to the scheme unless the outlay involved in the purchase of all beneficial interests was first ascertained and

the sum inserted in the scheme. The London County Council agreed to offer 50,000*l.*, 10,000*l.* of which was subscribed by the Hackney Board of Works, for their purchase. This offer was declined by the vendors, who afterwards said they would accept 75,000*l.* The Council agreed to increase its contribution to 50,000*l.* plus 15,000*l.* subscribed by the Hackney Board of Works. Of the remaining 10,000*l.*, 5,000*l.* was subscribed by Lord Amherst of Hackney. The whole transaction was embodied in the London Open Spaces Act, 1893, which, as it vested the marshes in the Council, did away with the necessity of the scheme proposed and supported by the Association. The Association hoped that the Council would, in time, look beyond the Hackney Marshes, and not rest content until the whole line of marshes from Tottenham to London had been acquired as one vast playing field.

Sir John Hutton said that he congratulated the people of Hackney upon the splendid acquisition which he was about to dedicate to their use for ever. Lammas rights had existed on the marsh, but by agreement between the lord of the manor and the several owners the marsh could at any time have been converted into freehold building land. The action of the London County Council, however, had made every resident of London a tenant for life of the Hackney Marsh. The Council had yet to carry out extensive drainage works in order to give greater facilities for football and other games in the winter months. They would also provide safe bathing pools, plant trees, provide seats and fence in the unprotected portions of the marsh. The Council could not send the people into the country, but it would do its best to bring the country to the people.

DEFECTIVE SCHOOLS.

THE first quarterly return has just been issued, as a Parliamentary paper, of public elementary schools (1) which have been warned by the Education Department under article 86 of the Code, including schools from which the grant has been withheld under that article; (2) which have been warned by the Education Department that the annual grant will in future be withheld unless defects in the school premises are remedied; (3) the annual grants to which have been suspended for three months or more from the date of the receipt by the Education Department of the inspector's report, on account of defects in school premises. Article 86 of the Code states that the school must be efficient, and that the grant will not be withheld under

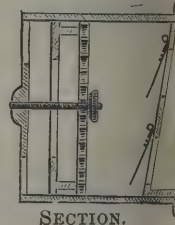
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article unless the inspector at his annual visit reports the school or class inefficient, and unless the Department gives a formal warning to the managers that the grant may be withheld at the next annual inspection if the inspector again reports the school or class to be inefficient. Under the first head there are 5 cases; but the grant was actually withheld in only five. The schools under the second head number 28, and in the majority of the cases the reason given for the warning is "premises unsatisfactory." They are situated in London (3), Berkshire (2), Cheshire (4), Devonshire (1), Herefordshire (1), Kent (1), Lancashire (2), Lincolnshire (1), Middlesex (1), Northamptonshire (1), Oxfordshire (1), Staffordshire (1), Surrey (5), Sussex (2), Worcestershire (1) and Yorkshire (1). Of the 28 there are eight National schools, four Church of England, three Methodist, four Wesleyan, two Roman Catholic, two Board and one general school. The remaining four are not classed. Under the third head there are three schools:—St. James's Roman Catholic School (Reading), Armathwaite (Cumberland) Church of England School and Heskin (Lancashire) Penrith's Grammar School.

THE SOUTH AFRICAN ASSOCIATION OF ARCHITECTS AND ENGINEERS.

The second annual meeting of the South African Association was held on June 27 in Johannesburg. Mr. A. H. Reid, the President, in his address stated that the membership had increased from forty-three to fifty-six, and that the finances were satisfactory. Application had been made for a charter of incorporation, but the Volksraad refused to grant one. Concerning buildings the President said:—It affords me great satisfaction to report that a most marked improvement in the class and quality of buildings erected in Johannesburg has taken place during the past year. The residential buildings recently completed are, as a whole, far superior to those met with in the neighbouring colonies, as regards comfort, sanitation, stability, architecture and furniture. The business premises are even more marked in their improvement, and the town may well be proud of such structures as Henwood's Buildings, the Aegis Buildings, the Gold Fields of South Africa Block, Green's Chambers and many others. The coming year, I know, close upon some equally creditable works, probably superior in style and finish to those of which we are now

proud, but which, on account of the pressure brought to bear upon us by clients, in the matter of time, are not the result of that placid thought which leisure and freedom from worry can alone provide. I am indebted to the courtesy of the town engineer for the following statistics of new buildings and reconstructed works that have passed through his office during 1893 and to date, viz.:—Dwelling-houses 798, business premises 24, shops 96, public halls 5, stores 81, schools 1, stables 71, workshops 11, churches 3, magazines 4, additions and alterations 116, making a total of 1,210 works, or 100 per month. For this year up to the 20th inst. plans for 368 new buildings and 113 alterations have passed through the department, or a total of 481 works. It is marvellous to me and creditable to his department, undermanned as it is, to get through the inspection of so many works without accident or complaint.

In view of the rapid increase of the town, I would suggest that the Council place their services at the disposal of the sanitary board, with the object of producing new and improved building by-laws. The existing ones are practically unworkable, and many new ones are absolutely necessary now. For instance, provisions for the escape of inmates and salvage of goods in case of fire should be made imperative in the immense piles that are now being erected. Access to roofs of all buildings over two storeys high should be provided with hand-rails for safe passage of the inmates of the upper floors in case they are cut off from escape by the staircases. A limit to the height of buildings in streets of varying widths should also be fixed. Regulations bearing upon party walls are most necessary, as the present absurd system of erecting two independent side-walls to each building, and wasting two or three feet of frontage in doing so, cannot, in the face of the value of land and frontage continue. I have just successfully carried through the first party-wall contract entered into in Johannesburg, which I reckon saved my client 300l. and 2 feet in the width of his frontage, and his neighbour the same.

The disfigurement of streets by huge advertisement hoardings has been started and should be suppressed, and the matter of sky signs also requires regulation, and some steps should be taken to curtail the network of overhead telegraph, telephone and lighting wires that are now spoiling the appearance of our streets. Having the honour of being a member of the sanitary board, I shall have much pleasure in introducing any proposed reforms to the attention of that body.

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suitable law courts, hospital, market and police and gaol accommodation, and will shortly have a new post and telegraph offices, but we still dream of a town hall, public offices, fire-brigade station, public bath and wash-houses, slaughter-houses, library, churches, schools, a proper water-supply, drainage system, garbage destructor, town lighting, and last but not least a town clock.

The building trade has been supplied with all labour it required for the past year, and the class of labour is much improved. There have been no strikes or disturbances in the constructive trades, but there have been many serious failures on the part of the masters, involving merchants and employers in heavy losses, and causing both engineers and architects serious annoyance. I attribute most of these failures to a lack of business capacity and capital, combined with incompetence in the matter of estimating. I consider it most necessary that a master builders or contractors' association be formed here for the purpose of keeping the trade together, establishing a business-like routine in the conduct of contracts and in estimating for them, and of providing a competent practical body to whom the professions would look for advice and assistance in case of need. I suggested the formation of such a society years ago, and it was started, but soon died an unnatural death.

The following officers were elected:—President, Mr. C. Aburrow; vice-presidents, Messrs. A. S. Boucher and S. Farrar; members of Council, Messrs. G. R. Andrews, A. H. Reid, J. H. Johns, T. Reunert, J. H. Davies, E. P. Rathbone, J. H. Hammond and E. D. Drummond.

CITY CHAMBERS, EDINBURGH.

SINCE the attempt made in the time of Lord Provost Sir Thomas Clark to provide suitable municipal buildings for Edinburgh nothing very great has been done in the matter, though since that date, says the *Scotsman*, a good deal of accommodation has been added to the City Chambers by the purchase of property on the east side of the Royal Exchange. Property in and about the Exchange has also been picked up as it came into the market, and now the Corporation is the possessor of considerable portions of the tenements on the west side of the Exchange, which would be needed were any considerable extension resolved upon. Some time ago, in view of the fact that with the continued increase of the city's business

there is growing a want of accommodation for committees, that there is great necessity for a new Burgh Court and D of Guild Court, a remit was made to the Lord Provost's committee to consider the whole question of the accommodation for municipal purposes. The matter for some reason drifted into the very capable hands of Dean of Guild Miller, who put himself to an immense amount of trouble in regard to and who in the course of his inquiries into the history of municipal buildings on this and adjoining sites in the High Street has unearthed a great deal of interesting information which in pamphlet form will likely soon see the light in conjunction with Mr. Morham, city architect, he has also prepared a series of elevations and plans showing a tentative way their views as to what might be done with the present buildings, were an extension and reconstruction of them resolved upon. A striking elevation has been made of the back of the lofty tenement, and how it might be made more decorative so as to give it a better appearance when seen from Princes Street. To this end it is proposed to build out a wing on its higher side to the line of Cockburn Street, and also about the point of the present square tower carried a storey above the roof and finished with a mansard roof. The decorative treatment applied to the proposed new wing and the tower is similar in style to that on the front of the building facing the Exchange. It is proposed to annex the large tenement on the west side of the Exchange formerly occupied by the Writers to the Signet and the Heriot office, and the upper storeys of which will not hold on together much longer. Should it all be acquired it would be pulled down, on this site would be reconstructed a new council chamber extending from the Exchange to Warriston Close, and with outlook also to the north. Below it would be a new Burgh court-room, greatly needed. The new council-room is to be about two and a half times the size of the present chamber with a gallery for the public and a reporter's gallery. The council chambers would be converted into a Lord Provost's room, and other parts of the building would be remodelled. The whole scheme is estimated to cost about 50,000*l.*, but was explained by the Dean at the meeting that it could easily be carried out in instalments if that were thought necessary. The committee passed no opinion on the plans, but ordered their exhibition in the chambers during the next few months in order that the members of the Council may see them and make up their minds about them.

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ST. PATRICK'S CHURCH, EDINBURGH.

ANS are shortly to be presented in Edinburgh Dean of Court for extensive alterations on St. Patrick's Roman Catholic Church, Cowgate. The building, then used as a presbyterian place of worship, was acquired by Bishop Gillis in 1755, since which time it has retained its old form. Its sombre exterior, however, has been relieved by frequent decoration and slight internal improvements. Now it is proposed to remove the gallery except a portion on the south side under the tower, to be used as an organ-loft. To make up for the loss of sleeping accommodation thus brought about, the lobbies and staircases will be removed, the present chancel used merely as a "Lady" altar, and the large area so set free furnished with seats. Accommodation is to be found for the principal altar and for side chapels on the north side, the porch on the west will be converted into a baptistery, and a covered way is to connect the presbytery with the church. The architects are Messrs. Buchanan & Bennet, George Street.

BUILDING IN SECLUDED AVENUES.

At the 19th inst. Mr. James Miller appeared at the North London Police-court, before Mr. Bros, on three summonses—for erecting a building in Miller's Avenue—a *cul de sac* in Arcola Street—which was of a greater height than the width of the street; (2) for laying out Miller's Avenue as a new street for foot traffic, which was not in accordance with the regulations of the Building Acts; and (3) for keeping such new street open without the consent of the London County Council. Mr. Bros, giving judgment, said that the case had been several times before the Court and he had thoroughly considered all the facts and points of law involved. The defendant first laid out six houses (enclosed with gates) in 1888, and was summoned by the Metropolitan Board of Works for an offence under the Act of 1861, sections 7 and 8. On that occasion the defendant was represented by counsel, and on the case of the Metropolitan Board of Works *v.* Nathan the summons was dismissed. It was then held that the houses had not been laid out as a street within the meaning of the Act. In 1890 the defendant laid out the rest of the avenue, which was separated from a wall from the six houses already mentioned. Defendant was summoned under the same section and counsel for the County Council cited a new case, but as the magistrate held

that the facts were not the same he dismissed that case also. Some time this year the defendant blocked up the exit of the six houses to Stoke Newington Road and built a warehouse upon the approach. The wall was then removed and the six houses first built were thrown into the newer portion of the avenue, the exit to which was through iron gates in Arcola Street. This warehouse was higher than the width of the roadway of the *cul de sac*, and the Council objected to it, and served the defendant with a notice which set forth that if their requirements were not attended to within seven days a summons would be issued. The notice described the avenue as being a "new street." As a fact, this *cul de sac* had never been held to be a new street, and the defendant not unnaturally came to the conclusion that he could do as he liked with his own property. He nevertheless, as he said, to avoid litigation, complied with the notice, but on the day the Council served the notice giving the defendant seven days' grace they issued a summons against him. As the defendant at once complied, the magistrate thought that the summons should have been withdrawn; but the Council thought otherwise, and pressed for a decision. He therefore held that, as the *cul de sac* in question had not been held to be a new street, the summons with reference to the height of the building could not lie, and he dismissed it. The matter might very properly have been left there. But the Council had seen fit to take out the other two summonses, and again bring before the Court a matter which was decided six years ago. Their excuse was that the circumstances had altered. He had viewed the place again, and had come to the conclusion that the condition of things was technically the same now as when he first had the matter before him. He held that the matter was *res judicata*, and he dismissed the other summonses also. It was ultimately arranged that the magistrate should consider an application for a case on the first summons, and that, in the meantime, the other two summonses should stand over.

LEEDS TOWN HALL DECORATION.

UNTIL the last few days, says the *Leeds Mercury*, the work of decorating the Leeds Town Hall has gone on almost unseen. The interior has been filled with a forest of scaffolding, leaving little visible but an impenetrable network of poles, spars and planks, among which the workmen were only here and there to be seen, the roof being altogether obscured. For some days

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past the work of removing the scaffolding has been steadily proceeding, and although the lower portions of the hall are as yet unfinished, the general effect of Mr. Crace's work is now visible. Some description of it will be interesting. The main object of the decorative scheme, as originally explained to the town hall committee by Mr. Crace himself, has been to do justice to the features and proportions of the architecture; to use such colouring and contrasts as would to some extent combat the too frequent gloom of our atmosphere; and lastly, to so arrange the colours as to produce an effective result by artificial light as well as by day. A visitor to the hall will notice the great semicircular vault of the roof with light tones of cream white, broken by mouldings and ornaments in gold and gold colour, and pierced by the square sunk panels or "coffers" of blue as a background to the large rosettes which occupy them. The vault is divided in its length into five bays by broad borders of bronzed laurel-leaf enrichments confined by wide gilt bands, the division corresponding to the position of the double columns below. These columns are painted in imitation of red marble, a treatment adopted originally by the architect of the building when it was first completed. Had there then existed the facilities which now exist for procuring coloured marbles, no doubt Mr. Brodrick would have been glad of the real thing, for it was his expressed intention that they should appear as coloured marble. The red tone of these is the keynote of the decoration. It appears as a ground to the ornament of the frieze and again in the arched linings of the windows, whilst it also marks out the semicircular ends of the hall as the ground colour of the inscriptions. There is no doubt that it does much to cheer and warm the interior, and affords a valuable contrast to the light tones of the roof and the buff panels of the walls. The capitals of the columns are bronzed and richly gilt, and the door dressings, the front of the new gallery, and some other features are similarly treated. Whilst the gallery inevitably shortens the hall, it must be admitted that the architect has dealt with it so as skilfully to minimise that drawback, and a handsome ceiling is now fixed beneath it. This, of course, is in complete shadow, and is therefore decorated entirely in soft shades of white. The vestibule is now in Mr. Crace's hands. Here the scaffold shuts out all but fragmentary peeps, which show that the treatment is not unlike that in the hall, but with deeper colouring. A visitor to the hall will hardly realise its great size. The mere erection of the scaffolding and its removal is no small matter. Upwards of 500 poles were

employed, besides boards, ropes, &c. This work has been well performed by a local firm, Messrs. Mountain & Son. The superficial area of surfaces to be painted or gilt is startling. The wide gilt bands which border the arches, dividing the main roof into bays, are each more than 4 inches wide, and their total length is about half a mile. They are gilt "solid." There is half a mile of one 3-inch moulding surrounding the panels of the roof, whilst the run of painted margins in the roof amounts to a mile and a half. The work is expected to be completed in about a month.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

13233. John Edward Morton, for "An improved fastening for gates and doors."
 13292. Thomas William Twyford, for "Improvements in water-closets."
 13302. Hugh Miller, for "Improvements in smoke-cowls and ventilators."
 13394. Mary Lavinia Puzey, for "Improvements in windows."
 13418. Herbert Butler Jones, for "Improvements in combined sash and casement windows."
 13420. Karl Haupt, for "Improved fastening device for doors, cupboards and the like."
 13447. Alfred John Ball and John de Courcy Hickton, for "Improvements in fasteners for window-sashes and the like."
 13461. John Shanks, for "Improvements in water-closets."
 13491. Charles Barr, for "An improved lock especially applicable as a sash-fastener."
 13625. George William Pollard, for "Improvements in window-sash fasteners."

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"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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CONTRACTS OPEN.

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ABERDARE.—Aug. 7.—For Building Two Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.

ALDEBURGH.—Aug. 10.—For Converting Portland House into Police Station. Mr. H. Miller, County Surveyor, 16 Museum Street, Ipswich.

ALNWICK.—Aug. 8.—For Additions to 25 Bondgate Without. Mr. M. Temple Wilson, Architect, 69 Narrowgate, Alnwick.

ANNFIELD PLAIN.—Aug. 6.—For Building Two Houses. Mr. G. R. Appleby, West Kyd, Annfield Plain, Durham.

ASHINGTON.—For Building Miners' Hall. Messrs. Boulds & Hardy, Architects, Bridge Street, Morpeth.

BASFORD.—Aug. 13.—For Building Two Cottages at Outfall Works, Greasley. Mr. Herbert Walker, Engineer, Newcastle Chambers, Nottingham.

BODMIN ROAD.—Aug. 7.—For Building House and Three Cottages at Railway Station. Mr. G. K. Mills, Secretary, Paddington Station.

BURNLEY.—Aug. 6.—For Building Textile Workers' Institution. Mr. S. Keighley, Architect, Nicholas Street, Burnley.

BURY.—Aug. 20.—For Construction of Brick Sewers. Mr. J. Cartwright, Borough Engineer.

CAMBORNE.—Aug. 7.—For Railway Station Buildings, &c. Mr. G. K. Mills, Secretary, Paddington Station, W.

CARDIFF.—Aug. 7.—For Building Railway Stations. Mr. G. K. Mills, Secretary, Paddington Station, W.

CARDIFF.—August 8.—For Reconstruction of Baths, Guildford Crescent. Mr. W. Harpur, Borough Engineer.

CHRISTCHURCH.—Aug. 25.—For Adding Block to Men's Quarters at the Workhouse. Mr. E. H. Burton, Architect, Bournemouth.

CHRISTCHURCH.—Aug. 25.—For Building Cottage Homes and Schools. Mr. A. Druitt, Clerk to the Board of Guardians. Mr. E. H. Burton, Architect, Bournemouth.

CO. DOWN.—Aug. 12.—For Building Two Dwelling-houses, Newcastle. Mr. Henry Hobart, Architect, Dromore, Co. Down.

CO. GALWAY.—Aug. 6.—For Rebuilding Lisbeg House, Eyrecourt. Mr. J. Smith, Engineer, Ballinasloe.

COVENTRY.—Aug. 3.—For Building Methodist Chapel and Schools. Mr. John Wills, Architect, Victoria Chambers, Derby.

CWMBACH.—Aug. 7.—For Building Three Cottages. Mr. G. K. Mills, Secretary, Paddington Station, W.

CWMGELLY.—Aug. 13.—For Building Mortuary Church. The Borough Surveyor, Swansea.

DARLINGTON.—Aug. 7.—For Building Permanent-way Workshops. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

DUNDEE.—Aug. 7.—For Building Public Library and Baths at Loches. Mr. J. Murray Robertson, Architect, 33 Albert Square, Dundee.

EARLS BARTON.—Aug. 10.—For Building Shoe Factory. Messrs. Mosley & Anderson, Architects, Goodyear Chambers, Northampton.

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FALKIRK.—Aug. 7.—For Steam Laundry. Mr. H. F. Kerr, Architect, 36 Hanover Street, Edinburgh.

FULHAM.—Aug. 9.—For Alterations and Additions to Workhouse. Mr. A. Saxon Snell, F.R.I.B.A., 22 Southampton Buildings, W.C.

GRANTHAM.—Aug. 7.—For Supply of Galvanised Iron Hospital. Mr. J. Evans, Borough Surveyor.

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HOLLOWAY.—Aug. 13.—For Boundary Walls and Oak Fences at Disinfecting Station. Mr. J. Patten Barber, Vestry Hall.

ISLINGTON.—Aug. 13.—For Erection of Boundary Walls at Disinfecting Station. Mr. J. Patten Barber, Vestry Hall, Upper Street.

KILLMARSH.—Aug. 13.—For Building Twenty-one Cottages. Mr. John Allsopp, Architect, Worksop.

KINGSTHORPE.—Aug. 6.—For the Main Drainage of the Village. Mr. John Ingman, 7 George Row, Northampton.

LIVERPOOL.—Aug. 7.—For Alterations to Railway Offices, 11 James Street. Mr. G. K. Mills, Secretary, Paddington Station, W.

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NORTH-EASTERN RAILWAY.—Aug. 8.—For Building Goods Warehouses at Amble and Broomhill, and Station-master's House. Mr. Wm. Bell, Architect, Central Station, Newcastle-on-Tyne.

POWBURN.—Aug. 11.—For Additions to Plough Inn. Mr. George Reavell, jun., Architect, Alnwick.

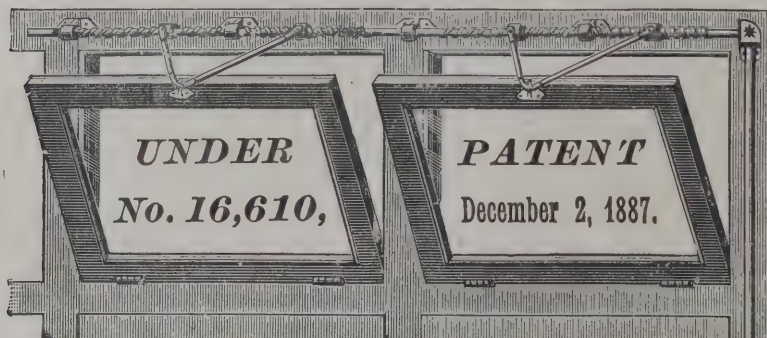
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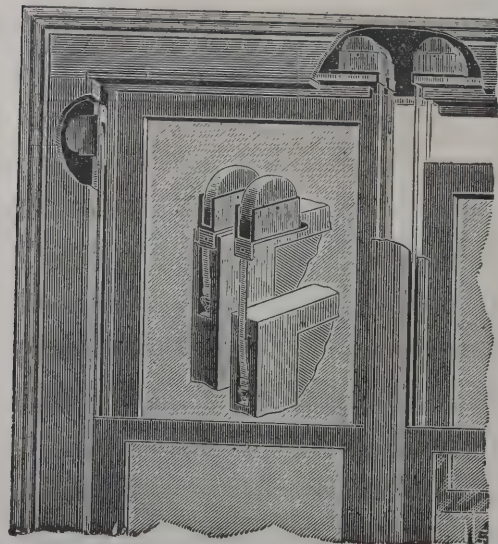
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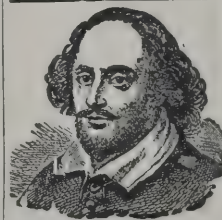
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Laing, Wharton & Down	£12,100	0	0
W. Mackie	8,880	0	0
T. Scott Anderson, Sheffield	5,660	0	0
Brush Electrical Engineering Co.	5,437	0	0
C. A. Parsons & Co., Newcastle	5,471	0	0
Johnson & Phillips	5,200	0	0
Paterson & Cooper, Dalston	5,000	0	0
J. G. Statter & Co., Limited	4,629	0	0
Greenwood & Batley, Limited, Leeds	4,565	0	0
Crompton & Co., Limited	4,444	0	0
Electric Construction Co., Limited	4,410	0	0

Supply of Boilers, &c.

Spurr, Inman & Co., Wakefield	3,375	0	0
Maudslay, Sons & Field, Limited	2,765	0	0
Babcock & Wilcox, Limited	2,554	0	0
Yates & Thom, Blackburn	2,436	0	0
J. Watt & Co.	2,450	0	0
Standard Ironworks, Colchester	1,403	0	0
Davey, Paxman & Co. (informal)	—	—	—

For Repairs to Stonework in the Ladies' Wing, &c., of the above Asylum, to be Executed in Tabary's Patent Metallic Cement. Mr. W. F. POTTER, Architect, Hatcham. A. DREYFUS & CO., Jewin Street (accepted).

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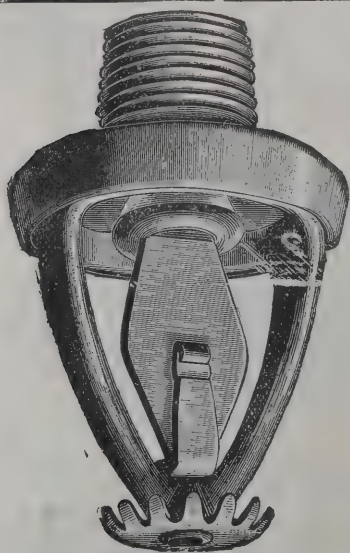
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LONDON—continued.

For Erection of Factory, Stables and Houses in Ravenscroft Street, E, for Mr. John Putney. Mr. W. A. FINCH, Architect, 76 Finsbury Pavement, E.C.

Bush & Sons	£8,080	0	0
Chessum & Sons	7,999	0	0
S. W. Hawkings	7,577	0	0
W. Gladding	7,559	0	0
JARVIS & SONS, Hackney Road (accepted)	7,475	0	0
Cousell Bros.	7,432	0	0

For Repairs to be Done at the Licensed Victuallers' Asylum, Asylum Road, Old Kent Road, S.E. Mr. Rowland Hirst, chairman; Mr. Alfred Wordsworth, chairman of repairs committee; Mr. A. L. Annett, secretary. Mr. W. F. POTTER, Architect, Hatcham.

E. Brown, Blackfriars	£409	16	6
H. H. Hollingsworth, Peckham	298	0	0
S. Hayworth & Sons, Kingsland	267	10	0
W. J. Walker, Poplar	243	0	0
F. DAWES, Peckham Rye (accepted)	229	0	0

MAIDSTONE.

For Heating Apparatus at St. Augustine's Sessions House, for the Kent Standing Joint Committee.

W. Tice, Canterbury	£333	0	0
N. Cruttenden, Maidstone	328	12	0
Pryor & Co., Maidstone	328	0	0
DRURY & BIGGLESTONE, Canterbury (accepted)	312	2	0
Surveyor's estimate	300	0	0

MONTGOMERY.

For Building Calvinistic Methodist Sunday School, for the Committee. Mr. FRANK H. SHAYLER, Architect, Welshpool and Oswestry. Quantities by Architect.

A. Watkins, Welshpool	£498	0	0
E. Davies, Welshpool	478	0	0
Jones & Son, Shrewsbury	436	7	0
Evans & Jones, Montgomery	432	12	1
W. W. N. Southern, Shrewsbury	429	1	3

NORTHFLEET.

For Additions to Wash-houses and Magistrates' Lavatory, Northfleet Police Station.

R. Fisher, Northfleet	£197	0	0
A. N. Pryor & Co.	184	0	0
W. H. RAYFIELD, Northfleet (accepted)	175	0	0

NORTHAMPTON.

For Additions and Improvements to No. 9 Lady's Lane, Northampton, for Mr. H. Harris. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Goodyear Chambers, Northampton. Quantities by Architects.

R. Hickman, Northampton	£400	0	0
J. Dunkley, Northampton	327	0	0
J. Garrett, Northampton	319	10	0
W. Beardsmore, Northampton	308	10	0
E. D. Sharman, Northampton	306	0	0
W. Gregory & Son, Northampton	295	0	0
T. Islip, Northampton	293	0	0
WILFORD & JUDKIN, Northampton (accepted)	277	0	0

NUNEATON.

For Building Police Court, Nuneaton.

WILLIAMS (accepted)	£5,980	0	0
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PONTYPRIDD.

For Building Business Premises and Offices, High Street, Pontypridd, for the Pontypridd Masonic Hall Company, Limited. Mr. T. R. PHILLIPS, Architect, Old Bank Chambers, Pontypridd.

J. REES, Ynysybwll (accepted)	£1,640	0	0
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RUSHDEN.

For Erection of Boot and Shoe Factory, Rectory Road, Rushden, Northampton, for Messrs. E. Claridge & Sons. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Goodyear Chambers, Northampton. Quantities by Architects.

G. Branson & Son, Northampton	£3,528	0	0
T. Swindall, Rushden	3,499	0	0
G. E. Fathers, Bedford	3,400	0	0
R. Cosford, Northampton	3,400	0	0
E. Brown & Son, Wellingborough	3,380	0	0
C. Bays & Son, Rushden	3,355	10	0
R. Marriott, jun., Rushden	3,330	0	0
H. Sparrow, Rushden	3,300	0	0
T. Wilmoth, jun., Rushden	3,299	0	0
G. Fisher, Northampton	3,270	10	0
F. Johnson & Son, Earls Barton	3,270	0	0
G. Henson, Wellingborough	3,250	0	0
T. & C. Berrill, Irchester	3,209	0	0
H. Martin, Northampton	2,939	0	0

* Accepted after modifications.

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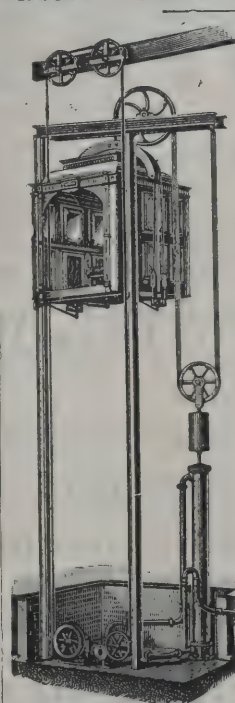
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READING.

For Buildings, Ventilating and other Works at Borough Police Station. Mr. ARTHUR E. COLLINS, Borough Surveyor.		
W. Hawkins	£199	0 0
M. E. Fitt	187	0 0
G. H. Tucker	185	0 0
T. Pilgrim (<i>recommended for acceptance</i>)	159	0 0

ROCHESTER.

For Factory at Eastgate, Rochester, for Mr. Walter Dove. Mr. WALTER BANKS, Architect, 5 Theobald Square, Rochester.		
M. C. Fenton, Strood	£787	10 0
C. E. Skinner, Chatham	778	0 0
West Bros., Rochester	685	0 0
W. Coker, Halling	635	9 6
G. West, Strood	625	0 0

SIDMOUTH.

For Path at West End of the Esplanade.		
E. Radford	£43	5 6
J. G. Northcote	40	0 0
Z. Darke	39	0 0
J. J. Courtenay	32	12 6

SOUTH SHIELDS.

For Proposed New Board Schools, Stanhope Road, South Shields, for 1,772 Scholars, for the South Shields School Board. Messrs. DAVIDSON & BENDLE, Architects, Newcastle and South Shields. Quantities by Architects.		
W. J. Robertson, South Shields	£17,557	0 0
T. L. Miller, Tynemouth	16,897	0 0
S. Sherrif, South Shields	16,590	0 0
T. Hunter, Washington	16,402	0 0
A. Pringle, Gateshead	16,357	0 0
J. C. Hope, Newcastle	16,352	0 0
Cowper & Henderson, Jarrow	16,256	0 0
W. Christie, South Shields	16,125	0 0
J. Young, South Shields	15,950	0 0
T. Kennedy, Jarrow	15,907	0 0
T. Lumsden, Jarrow	15,700	0 0
J. Elliot, North Shields	15,393	0 0
P. GOODWIN & SON, South Shields (<i>accepted</i>)	15,380	0 0

SHEERNESS.

For Grand Stand, Botany Road Ground, Sheerness, for the Sheppey United Football Club.		
E. F. Hughes, Sheerness	£232	0 0
J. R. Brett, Sheerness	189	0 0
F. Berry, Sheerness	177	10 0
J. Bligh, Eastchurch	173	9 0
L. Seager, Steam Saw Mills, Sittingbourne	168	0 0

SHOREHAM.

For Works at the Pumping Station, Old Shoreham. Mr. C. O. BLABER, Engineer.		
Rooke, Southwick	£1,195	0 0
Saunders & Son, Brighton	1,164	0 0
CURD, Shoreham (<i>accepted</i>)	1,023	0 0

ST. ANDREWS.

For Sewerage Works. Mr. HENRY BRUCE, Engineer.		
R. Chalmers, Colinsburgh	£1,872	19 6
W. Chalmers, Burntisland	1,839	0 0
J. & C. Hay, St. Andrews	1,789	3 3
L. & W. Macdonald, Inverkeithing	1,779	15 3
J. Martin, Dunfermline	1,749	16 5
A. White, Largs	1,673	16 5
D. McDonald & Son, Hawick	1,661	11 5
Mitchell & Co., Dundee	1,651	10 8
W. Anderson, Dundee	1,506	13 1
G. Mackay & Son, Broughty Ferry *	1,483	5 8
R. Gilmer, Strathmiglo *	1,366	1 7
J. & J. Stevens, Buckhaven *	1,261	0 0

* Amended tenders.

ST. BUDEAUX.

For Shed and Railings and Other Work at Schools, St. Budeaux. Mr. W. N. RICHARDS, 29 St. Aubyn Street, Devonport.		
A. Northcott, Devonport	£150	0 0
Paynter & Davy, Plymouth	85	0 0
G. Maddock, Stonehouse	78	10 0
Woods & Bickle, Devonport	65	10 0
Jeffrey & Young, St. Budeaux	57	4 0

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For 1,850 Yards of Wrought-iron Fencing, for the Local Board.

Mr. A. H. MOUNTAIN, Surveyor.			
G. Chiles, Burgess Hill	£632	6	1
W. T. Burbidge, Leicester	627	0	0
E. Foreshaw & Son, Warrington	613	4	0
W. L. Sharpe, Grimsby	596	0	5
Taylor & Ryder, Manchester (late)	566	3	0
Princess Metal Works, Manchester	562	4	9
Bruce & Still, Liverpool	559	4	7
Johnson Bros., London	551	2	4
Rowland Bros, Bletchley	542	14	0
G. B. Smith & Co., Glasgow	531	1	0
Hydes & Higfull, Sheffield	531	5	5
Staffordshire Bolt Company, Darlaston	531	4	11
Blakeley & Pickering, Ravensthorpe	527	5	0
H. Luke, Manchester	505	5	8
F. Morton & Co., Garston	503	11	5
Hill & Smith, Brierley Hill	496	15	3
W. Hayward & Sons, Wolverhampton	496	3	9
T. W. Palmer & Co., London	484	11	4
J. Mountford & Co., Manchester	470	9	6
W. H. Wharton, Chesterfield	469	9	0
Bayliss, Jones & Bayliss, Wolverhampton	452	1	6
Wilkes, Limited, Darlaston	439	7	8
E. J. RAYBOULD & CO., Workington (accepted)	421	1	5

WEST HAM.

For Erection of Corporation Stabling, Abbey Road, West Ham. Mr. LEWIS ANGELL, Borough Engineer.

G. Sharpe, Stratford.	£9,300	0	0
Coulsell Bros., Bethnal Green	8,287	0	0
White & Son, Bow	8,266	3	6
Stimpson & Co., Brompton Road	8,100	0	0
W. Watson, Ilford	7,900	0	0
Hearle & Farrow, St. George's	7,798	0	0
W. J. Maddison, Canning Town	7,790	0	0
S. J. Scott, London Wall	7,695	0	0
Gregar & Son, Stratford	7,437	0	0
Kirk & Randall, Woolwich	7,337	0	0
Scotney & Wooten, Plaistow	7,300	0	0
H. J. CARTER, Grays, Essex (accepted)	6,826	0	0

WEST HAM—continued.

For Supply of Furniture for Public Hall, Barking Road, Canning Town, for the West Ham Town Council. Mr. LEWIS ANGELL, Borough Engineer.

J. Rubery	£467	13	6
Ardley & Son	459	1	0
J. R. Roberts	428	19	11
H. J. & G. E. Duck	352	1	0
Oetzmann & Co.	345	1	8
Atkinson & Co.	336	3	3
Peppercorn Bros.	325	9	9
E. AMIES (accepted)	254	18	0

TRADE NOTES.

THE St. John's School, Bristol, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE parish church, Alvaston, Derbyshire, has just been enriched by the addition of a large chiming clock and peal of bells, the whole being the gift of Mr. W. Bradshaw. The clock is fitted up with all the latest improvements, and was made by Messrs. John Smith & Sons, Midland Clock Works, Derby. The bells were from the foundry of Messrs. Taylor & Co., Loughborough.

WE are informed by Mr. Arthur V. Rutty that, for the executrix of the late Mr. Geo. G. Rutty, he would begin the scarifying of the roads in the Royal parks for Her Majesty's Commissioners of Works with his latest improved patent macadam road scarifier on August 1. The total area to be scarified is from 120,000 to 130,000 superficial yards. The machine will be working continuously for the next six or seven weeks, commencing with Hyde Park.

THE directors of Perry & Co., Limited, steel pen makers, have resolved to pay on September 1 an interim dividend on the ordinary shares for the first six months of this year at the rate of 10 per cent. per annum, free of income-tax, being at the same rate as for the corresponding period last year. The half-yearly dividend on the preference shares will be paid as usual at the fixed rate of 5 per cent. per annum.

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At Glasgow, Sheriff-Principal Berry, on appeal, has confirmed the decision of Sheriff Mair against the Rawyards Coal Company, Limited, finding them liable to the trustees of the late Robert Aitken, spirit merchant, Rawyards, in 293*l.* 10*s.* and expenses, for damages to property known as the Old Toll Buildings through the mineral operations of the company, with additional expenses.

At the Govan Dean of Guild Court, Mr. J. G. Sharp, house factor, Glasgow, applied for authority to erect eleven tenements of dwelling-houses at the corner of Holm and Sharp Streets. The Clyde Trust objected to the lining on the ground that the fear was bound by his titles to make Holm Street 50 feet wide instead of 28 feet, as was proposed in the plans. The burgh surveyor also objected, contending that the 28 feet street in the plans was not wide enough. The case was continued for a fortnight.

At the Edinburgh Dean of Guild Court twelve warrants were granted, to Rev. Monsignor Grady to make additions to St. Patrick's Church, South Gray's Close; Archbishop Macdonald and others, for the making of a subway leading from the Roman Catholic Cathedral, Broughton Street, to the new presbytery, in connection with the extension of the cathedral; the North British Railway Company for the erection of a bridge at North Back of Canongate, in connection with the extension of the Waverley Station.

The tower of Norton Church, near Yeovil, has been destroyed by lightning, the damage done being estimated at 1,000*l.*

THE annual report of Mr. Hainsworth, inspector of buildings, which has been prepared for the building clauses committee, the *Leeds Mercury* says, shows that the 2,017 new buildings approved include nine villas, thirty semi-detached villas, 586 through houses, and 1,392 back-to-back houses. Among forty-five miscellaneous plans were two churches, four chapels, one addition to church, two additions to chapels, five mission-rooms, a synagogue, four schools (two with swimming-baths attached), seventeen additions to schools and other buildings of a public nature.

A SERIOUS fire has occurred in Liverpool in the Edward Street corn and rice mills of Mr. F. Dresser. The buildings, with valuable machinery and large stocks of grain, were totally destroyed, the damage amounting to about 20,000*l.*

At the meeting of the Birmingham City Council, the health committee were authorised to expend 38,000*l.* in extending the scarlet-fever hospital in Western Road, Spring Hill, and the proposal of the free libraries committee to erect a library for Balsall Heath, at a cost of 5,500*l.*, was sanctioned.

THE Liverpool Corporation surveyor is to receive 75*l.* per annum for periodical inspection of theatres and places of amusement licensed by the corporation. The salary of Mr. Shelmerdine is about 1,100*l.*, and he has a deputy who receives 500*l.*

ELECTRICAL.

At the meeting of the Mersey Docks and Harbour Board the warehouse committee recommended the establishment of a system of electric lighting at the Albert Dock warehouses, at an estimated cost of 2,050*l.*, and the docks and quays committee proposed to fit up sheds at Wallasey Dock, and to connect them with the Birkenhead foreign animals wharf, at a cost of about 4,450*l.*

THE electric tramway from Douglas to Laxey, Isle of Man, has been formally opened to public traffic.

YESTER HOUSE, the seat of the Marquis of Tweeddale, is being fitted throughout with the electric light, water power furnishing the energy necessary to drive the dynamo. The latter will be situated at the mains, about half a mile distant from the mansion, to which connection will be made by means of an underground cable. There will be a battery of accumulators for maintaining the lights when the dynamo is not running, and altogether some 300 incandescent lamps will be employed.

THE North Cliff at Bridlington Quay has just been lighted with electric light for the first time.

THE electric works at Hanley were opened on Thursday. The contract was taken by Mr. Cornelius Cornes for the erection of the requisite buildings at the generating station. The electric works are situate on land belonging to the Park estate, on the south side of Clifford Street. The main block has a frontage to Bethesda road of 85 feet. The main engine-room has a length of 68 feet, a width of 35 feet 6 inches, and a height at sides of 25 feet.

THE lighting arrangements of Leeds parish church will be fully completed by the 12th inst. The church will be partly lighted by electricity on Sunday.

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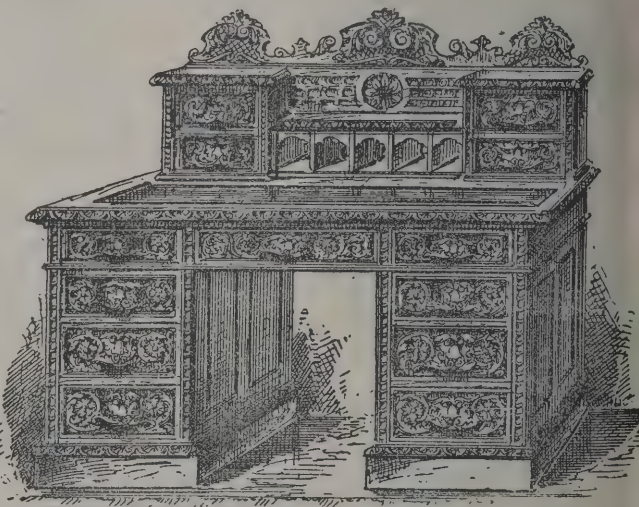
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VARIETIES.

MR. J. F. BENTLEY, of John Street, Adelphi, has been entrusted with the preparation of plans for the Roman Catholic Cathedral to be erected in Westminster. The building is to be in the style of the early basilicas, and adjacent will be a monastery for Benedictine monks.

THE foundation-stone of the Metropolitan Asylums Board's new fever hospital at Shooter's Green has been laid. It is estimated to cost 200,000*l.*, or 400*l.* per bed.

"DYNAMO Attendants and Their Dynamos" is a thoroughly useful and exhaustive treatise by Mr. Alfred H. Gibbings, A.I.E.E., just published by Mr. Sidney Reutell, 29 Ludgate Hill, E.C. The treatise runs to over fifty pages. The matter dealt with has already mainly appeared in the form of serial articles in our contemporary *Electricity*. As the information given by Mr. Gibbings has been much appreciated, he has been well advised to publish it in book form.

THE export of timber from Norway, which in 1891 amounted to 1,931,561 cubic metres, was reduced in 1893, according to official statistics, to 1,686,505 cubic metres.

MESSRS. TURNER are now showing in their Bond Street Gallery—a long, handsome, well-lighted apartment—some large and valuable works of art, consisting of articles of bedroom furniture wrought in porcelain, fancifully designed and elaborately executed in form and colour. It was Mr. Hales Turner's idea not only to produce washstands, dressing-tables, basins, ewers and trinket sets in porcelain, but also to assign to each article a genuinely artistic shape, and to decorate and adorn it after a definite and coherent plan, poetical and other stories being illustrated. The gallery has been sumptuously and gracefully decorated by Messrs. Oetzmann & Co., of Hampstead Road, each of the four porcelain suites being set off by an elegant scheme of plush and silk drapery, the same stuffs being lavishly used in the decoration of other portions of the room, and the ceiling being hidden by an arrangement of light-blue silk, so disposed as to create a sky-like effect.

THE Liverpool City Council have agreed to offer 17,650*l.* to the Government for the site of Kirkdale Gaol and buildings, the site to be used as an open space.

AT the meeting of the parks committee of the Edinburgh Town Council it was agreed to increase the estimates by about 50*l.* to provide for the enlargement and improvement of the skating-ponds at the Braids, and for the erection of a bowl-

house at the East Meadows in connection with the bowling-green there.

AT the meeting of the Carnarvon Town Council Mr. Lloyd Jones was elected borough surveyor.

AT a meeting of the Liverpool City Council the following recommendation of the insanitary property committee was adopted:—"That the Council place at the disposal of the insanitary property and artisans' dwellings committee the sum of 25,000*l.* for the purchase and demolition of insanitary property, and that the purchase of the following property be approved, viz.:—Ford Street—Nos. 30, 31, 32 and 33, Nos. 1 to 6 in No. 9 court, and Nos. 1 to 6 in No. 10 court."

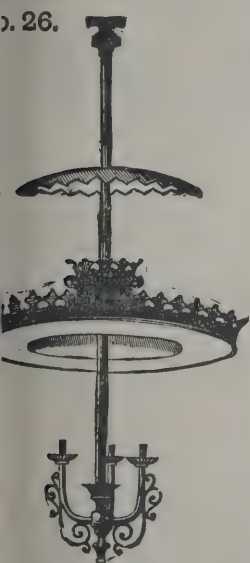
NOTES ON NOVELTIES.

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NEW SCHOOL, SALFORD.

THE Salford School Board having recently invited competitive designs from five firms of architects practising in Manchester and Salford for the erection of a new school, Marlborough Road, Hightown, have chosen for execution the scheme submitted by Messrs. Woodhouse & Willoughby, of 100 King Street, Manchester. Provision is made for 370 scholars, 450 infants on the ground-floor and 420 girls on the first-floor. A gymnasium and cookery-room are also provided. The school is on the central hall principle. The front elevation is intended to be faced with Ruabon stocks and terra-cotta. A mechanical system of heating and ventilating is contemplated operating from the basement by means of fans. The estimated cost is about 9,000*l.*

p. 26.



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DOOR IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE WILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1*s.* each. Free by post, carefully packed in patent roller, 2*s.* 3*d.* GILBERT WOOD & CO., 175 STRAND, LONDON, W.C.

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1866, and December 1872.

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Water-testing Apparatus for detecting impurities in Water, 10*s.* 6*d.* and 12*s.* each.

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BROOK HOSPITAL, SHOOTER'S HILL.

THE ceremony of laying foundation-stones is one that we always are disposed to assist in, for although we can take no responsibility in the rearing of the superstructure, we feel that officially we are called upon to see that this initiatory step is satisfactorily performed and that the solemn declaration "well and truly laid" is not omitted at the right moment.

Rarely in our experience has the public taken part in a more interesting stone-laying than that of Wednesday last, when at the invitation of the Metropolitan Asylums Board, we were present at the Shooter's Hill site, in company with a distinguished circle of public men from all parts of the United Kingdom.

The Board had very considerably invited the members of the British Institute of Public Health, whose congress in the Metropolis has been a feature of the week, and the president, Professor W. R. Smith, with a large contingent of his colleagues, were present.

No expense had been spared in providing an ample supply of carriages to convey the visitors from Blackheath Station to Shooter's Hill, and the whole arrangements for the reception and entertainment of the guests were simply perfect.

It hardly comes within the scope of our report to particularise the well-planned programme which was carried out with punctuality and precision, but we will just remark that Sir Edwin H. Galsworthy, the chairman, gave a most interesting *résumé* of the important work accomplished by his Board during the twenty-seven years it had been established.

The great increase of the population of London and the compulsory notification of disease, together with anxiety of the general public to avail themselves of hospital treatment, necessitated these large additional buildings. Though, in the first instance, the cost was considerable, the saving of the lives of bread-winners reduced the probabilities of pauperism, and thus the annual Poor Law expenditure was lessened. He was glad to be able to assert that the strong prejudice of the public against these hospitals in their neighbourhood was lessening, and in securing the present site there had been practically no local opposition.

Sir E. H. Galsworthy alluded with pleasantry to the proposal made by some of the busy members of the London County Council that they should absorb the Metropolitan Asylums Board, and whilst admiring their ambition for enlarged functions, he ventured to think that the twenty-seven years'

experience his Board had had was too valuable to be thrown away.

Following his speech and the chaplain's prayer (Rev. J. C. Leck), Lady Galsworthy, with special grace and unhesitating precision, laid the stone in proper form under the skilled and critical eye of the architect, Mr. T. H. Aldwinckle, F.R.I.B.A., of Westminster.

A further interesting address by Mr. A. C. Scovell, J.P., and complimentary speeches by Professor W. R. Smith and Mr. J. Brown closed the proceedings.

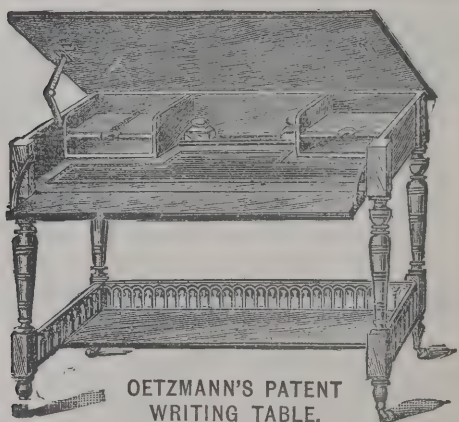
At a later part of the afternoon Sir Edwin H. Galsworthy alluded in most eulogistic terms to their architect, who had been unanimously appointed to plan and superintend the construction of the entire scheme.

His previous work for the Board, and especially in the erection of the Fountain Temporary Hospital, Lower Tooting, built and opened in nine weeks, had in the past indicated his special knowledge and mastery of the Board's requirements; and as Chairman he had no doubt that in this instance Mr. Aldwinckle would even excel past achievements.

The architect's response to this public recognition, though brief, indicated his appreciation of the Board's marked confidence in him, and the assurance was expressed of success in carrying out all the important desiderata, as far as the building could do so, to save life and effect speedy cures.

A subsequent examination of the plans showed that the hospital would occupy about 22 acres, leaving a further 10 acres uncovered with buildings—a wise precaution. Accommodation will be provided for 500 patients suffering from scarlet fever, enteric fever, or diphtheria. Not only will there be separate pavilions for each of these diseases, but the wisdom of having several isolation and separation wards for patients is fully provided for.

Much care has been taken to secure the comfort and maintain the good health of the officers, nurses and servants of the establishment (numbering probably 300), a point to which the Chairman feelingly alluded in his opening speech. The all important questions of drainage, comprising something like nine miles of drain pipes of various kinds, utilisation of rain-water from the roofs for laundry purposes, soil drainage, in no way connected with the rain-water drainage, and the simple yet well-ordered system of ventilating by means of vertical glazed-brick shafts with steam coils inserted to obtain upward draught, warming the whole of the wards, rooms, corridors, &c., appear to have received the most thoughtful care on the



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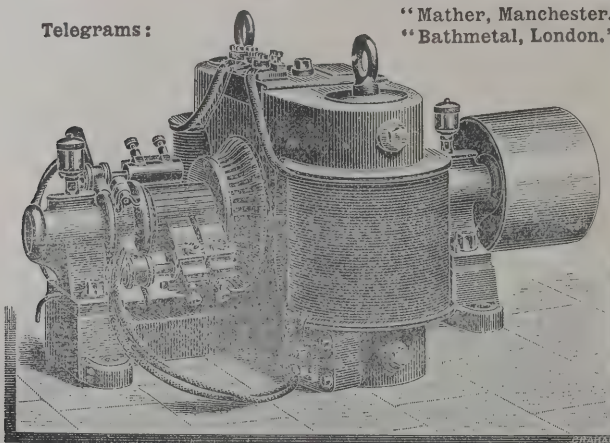
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part of the architect and the committee charged by the Board with the responsibility of the erection.

Due regard appears to have been paid to the non-absorbent character of the floors and walls of rooms where water will necessarily be used, glazed bricks and impervious tiling being provided for.

Teak, wax polished, has been selected as the most suitable wood for the floors of all infectious wards.

Notwithstanding that the utmost judicious economy will be observed, the cost of the hospital, including officers' residences, stations and stables for twenty ambulances and horses, boundary-walls, drains, roads, electric-lighting, &c, will amount to nearly 200,000/.

The elevation, though not without architectural merit, is free from elaboration, and has been treated more from a substantial and useful point of view than from that which is ornate.

The site being on high ground, preference has been given to the well-known hard red-facing bricks made in the Leicestershire district as offering the greatest possible resistance to the weather.

The fact of the land sloping towards the south will to a great extent facilitate drainage by gravitation. It is noteworthy that as the whole of the establishment will be divided into infected and non-infected areas (the latter embracing the entire administrative department and stores), visitors and others from the outside will neither enter nor come in contact with the infected section.

The contractor for the bulk of the work is Mr. Charles Wall, of Chelsea, who has few equals, perhaps, in constructions of this class. Messrs. Shillitoe & Sons and Messrs. H. Wall & Co., have also been selected to complete certain parts of the building.

ILLUSTRATIONS.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE DINING-ROOM.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE STAIRCASE.

LONGHOUSE FARM.

WATERHEAD BATHS, OLDHAM.

THE TOWER BRIDGE.

DURING the first fortnight the Tower Bridge has been opened 1,173,645 foot passengers and 61,257 vehicles passed over it. The bascules were raised 273 times, and 329 vessels passed through the opening. The number of pedestrians on the first three days and on the two Saturdays and Sundays was no doubt largely made up of sightseers, but this remark does not apply to the vehicular traffic. This is now about one-third of what was the total daily vehicular traffic on London Bridge before the Tower Bridge was opened, and is a much larger proportion of the heavy waggon and van traffic. The result is naturally a most perceptible relief to London Bridge. The average detention of the land traffic by the opening and shutting of the bascules is not great, being usually considerably less than a daily average of ten minutes for the double operation, except on the two Sundays, when the great crowds of 147,000 and 156,000 people no doubt tended to increase the time required for clearing the bridge.

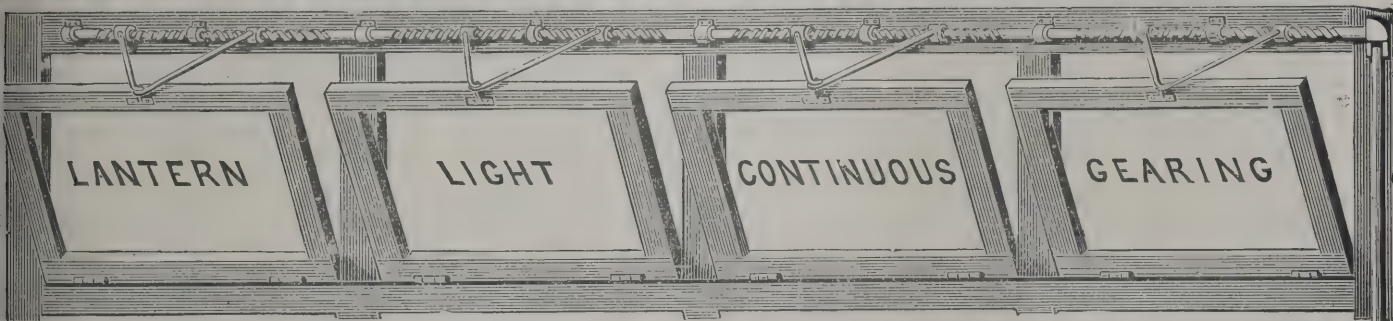
QUARRYING METHODS OF THE ANCIENTS.*

THE methods of obtaining stone for general building purposes by the ancients have become known to us by the explorations which have been made in the early Egyptian quarries, and in what may with propriety be called stone-mines. Of the latter, the workings at Tourah and Massourah, in the Mokattan range of hills, south of Cairo, from which the whole of the limestone used in the Pyramids was obtained, are good examples. These stone-mines were opened and worked in this way:—

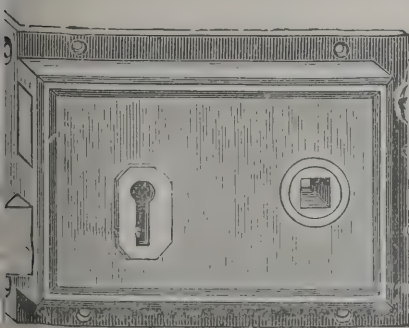
A gallery about 20 feet wide and high was run from the face of a cliff, in a carefully selected stratum of rock (in this case a fine-grained nummulitic limestone) deep into the heart of the mountain. In driving this gallery the workmen excavated a recess or "heading" at its top, high enough for them to work in, and of the full width of the gallery, and they carried this heading far enough forward to enable them to cut a groove vertically downward behind the first block of stone that was to be taken out. While this was being done, other workmen were cutting vertical grooves on each side of the gallery from

* By W. F. Durfee, M. Am. Soc. M. E., published in the *Engineering Magazine*, New York.

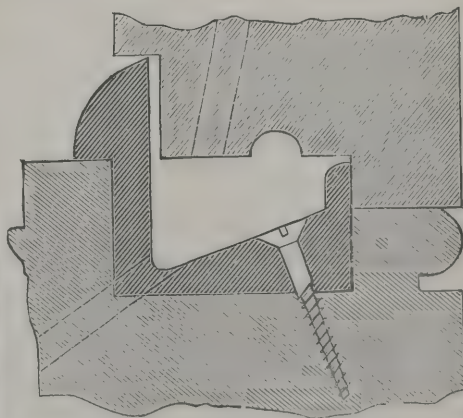
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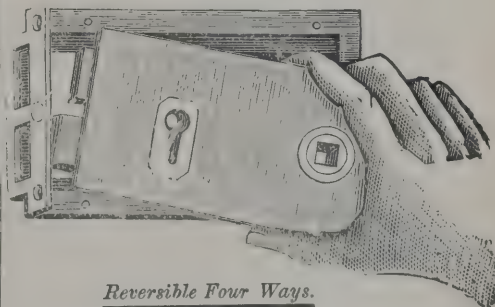


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the heading to the gallery floor. At the same time a groove was cut at the level of the floor connecting the two flanking grooves. The mass of stone bounded by the three grooves and the heading was then divided into such sized blocks as was desired, the upper block being first removed, and as soon as it was out of the way the heading was pushed forward. After the entrance gallery had advanced a sufficient distance from the face of the cliff, another gallery was opened at right angles to it and extended on either hand; and at the distance of 20 feet another gallery was driven parallel to the last, and still other galleries parallel with the first, until finally, by a rectangular system of intersecting galleries, a very large space in the interior of the mountain was converted into an enormous hall, the roof of which was supported by pillars 20 feet square, standing 20 feet apart.

The stone excavated was all removed through the entrance of the first gallery, which was often at a considerable height above the base of the cliff, a ramp having been constructed from the entrance of the workings down which the stone was dragged on sledges by men or oxen. The ancient quarrymen, in driving galleries, were accustomed to trim the roof to the required level, and on it was then drawn a centre line in red, and the sides of the gallery were then trimmed vertically in planes parallel to this centre line. The open quarries of Egypt are vast *intaglios*, cut deep in the living rock by a skill whose evidences in tool-marks and drill-holes, in the selection of good materials and the rejection of bad, remain after the lapse of more than three thousand years to excite our wonder that such achievements were possible without the aid of powder-drills or explosives.

Granite in large masses was always obtained by the Egyptians from open quarries, the most famous of which were at Syene (hence the word "syenite," designating a variety of granite composed of quartz, hornblende and feldspar) in Upper Egypt, near the first cataract of the Nile. The methods adopted for the horizontal quarrying of granite blocks of ordinary size was to cut a narrow groove 2 to 3 inches deep parallel with a vertical face of rock at such distance as the width of the desired stone required. In the bottom of this groove rectangular holes were made, about 2 inches long, 1 inch wide and 2 inches deep. These were usually placed about 4 inches apart. Dry wooden plugs were then driven tightly into these holes, and the spaces between them in the groove first mentioned filled with water, and the expansion of the plugs as they absorbed this water split the stone in the line of the holes. No more uniform and simple application of sufficient force for the purpose could possibly have been devised.

The Egyptian method of quarrying out an obelisk from a granite ledge is well illustrated by the enormous partially-finished monolith still remaining in the quarry at Syene. This obelisk would have been if completed (it is still attached to the floor of the quarry) larger than any now known. According to Wilkinson it measures 95 feet long and is 11 feet 1½ inch square at its base, and weighs 1,540,000 lbs., or 770 net tons. It was brought to its present condition by carefully excavating the rock on either side of it, dressing the sides and upper surface to their intended form, and running a groove along each side next to the floor of the quarry, preparatory to the introduction of wooden plugs for separating it from the bed-rock in the manner already stated. But these plugs have never been fashioned, and the vast mass has told the succeeding generations, for unknown thousands of years, of the technical methods of men who wrought long prior to the time when "Solomon's builders and Hiram's builders and stone-squarers" gave dimensions and beauty to the silently-assembled details of the grand temple of the wise king.

Hindustan abounds in examples of rock-cut or quarried temples and shrines. The "Kylas" temple Ellora is cut out of the solid granite rock with wonderful skill and elaboration of detail. The quadrangular pit in which this temple stands has on its sides and rear end (its front being open) rock-cut colonnades and cloisters, the columns of which support the perpendicular rock above. This temple is supposed to have been quarried out to commemorate the triumph of the Sivites over the Buddhist faith. Lanka Cave, Ellora, India, is another excellent example of Hindu quarrying. This rock-cut cave is in the immediate vicinity of the "Kylas," a portion of which can be seen at the right of the right-hand columnar pier. The Buddhist "Chaitya" Cave, or cave temple at Ajunta (circa 200 B.C.), is, according to Fergusson, "one of the most perfect, though far from being one of the most splendid, of the 'Chaitya' caves in India. In this instance every detail is cut in the solid rock, and there does not appear to have been a single wooden ornament on any part, so that we now see the cave nearly as it was left when first excavated." Similar work, though on a less elaborate plan, was executed at Petra, a rock-cut city of Arabia Petraea, about half-way between the south end of the Dead Sea and the head of the Gulf of Akabah. The rock-cut edifices in Petra are supposed to date about the second and third centuries of our era.

Of the methods employed from the earliest times in Hindustan for quarrying large masses of granite we are given an insight by the work done (entirely by native workmen) in the erection of an obelisk at Seringapatam in the early years of the present century. The stone quarried for this obelisk was 84 feet in length, but the completed shaft was somewhat shorter, a small piece having been accidentally broken off in handling the rough stone. It was 6 feet square at the base when finished, and was placed upon a plinth of a single block of granite 7 feet square and 9 feet high, in the top of which was formed a socket 6 feet square and 3 inches deep, to receive the base of the obelisk.

Colonel Wilkes says:—"Although I anxiously watched the progress of this interesting work, I as anxiously left it to be exclusively Indian, and the design of the obelisk was the only aid afforded by any European to the native workmen."

Colonel Wilkes gives the following description of one of the methods adopted in the quarrying of granite at the quarries of Seringapatam, and states that it was used in the case of the above-named obelisk:—"The spot being determined, a line is marked along the direction of the intended separation, and a groove about 2 inches wide and deep is cut with chisels, or, if the stratum be thin, holes of the same dimensions, at 1½ or 2 feet intervals, are cut along the line. In either case, all being ready, a workman with a small chisel is placed at each hole or interval, and with small iron mallets the line of men keep beating on the chisels, but not with violence, from left to right or from right to left. This operation, as they say, is sometimes continued for two or three days before the separation is effected."

Sir J. F. Herschell describes another method which is sometimes used at the same quarries, but which "does not produce so clean a fracture as the first beating. . . . The workman having found a portion of the rock sufficiently extensive, and situated near the edge of the part already quarried, lays bare the upper surface, and marks on it a line in the direction of the intended separation, along which a groove is cut with a chisel about a couple of inches in depth. Above this groove a narrow line of fire is then kindled and maintained till the rock below is thoroughly heated, immediately on which a line of men and women, each provided with a pot full of cold water, suddenly sweep off the ashes and pour the water into the heated groove, when the rock at once splits." This brings to mind the method attributed to Hannibal of splitting rocks during his passage of the Alps, and it has been suggested that his use of vinegar instead of water may have been found advantageous as applied to certain kinds of rocks.

(To be continued.)

THE IRON AND STEEL INSTITUTE.

THE autumn meeting of the Iron and Steel Institute of Great Britain will this year be held in Brussels, under the presidency of Mr. E. Windsor Richards. It is just twenty-one years since the members met in Belgium, the autumn meeting of 1873 having been held in Liège. The Brussels meeting will begin on Monday, August 20, and will end on Friday, August 24. It is expected that the meeting will be very numerously attended, about 500 members having already intimated their intention of being present. The arrangements for the meeting are being organised by an influential local reception committee, of which M. Gillon, president of the Society of Engineers of Liège, is chairman, in conjunction with the general secretary of the Institute, Mr. Bennett H. Brough. Upon the arrival of the members in Brussels on August 20 there will be an evening reception by the burgomaster at the Hôtel de Ville, to which ladies are invited. The morning of Tuesday will be devoted to the reading and discussion of papers in the hall of the Bourse, whilst the afternoon will be given up to a visit to the Antwerp International Exhibition. Further papers will be read and discussed on Wednesday morning, and in the afternoon places of interest in the city will be visited. On Thursday the members will leave Brussels by special train to visit the Mariemont collieries and the Couillet Steelworks at Charleroi, returning to Brussels in the evening. The last day of the meeting will be devoted to a visit to the works of the Cockerill Company at Seraing and the Angleur Steelworks at Liège, the members returning to Brussels in the evening. It is expected that there will be a reception of the members by the King of the Belgians; this, however, has not been definitely settled. There will be no lack of papers for reading and discussion, there being no fewer than ten set down in the list. Of these the first will be "On the Use of Caustic Lime in the Blast Furnace," by Sir Lowthian Bell, who was the president of the Iron and Steel Institute upon the occasion of the Liège visit. The history of crucible steel will be treated by Mr. R. A. Hadfield, whilst papers on other branches of metallurgy and metallurgical chemistry will be contributed by Messrs. T. W. Hogg, H. C. Jenkins, W. G. McMillan, John Parry and D. Selby-Bigge respectively. Two

papers of leading local interest will be contributed by Belgian engineers, namely, "On the Coal Mining Industry of Belgium," by M. Briart, president of the Society of Engineers of Hainaut, and "On the Iron and Steel Industries of Belgium," by M. A. Gillon, president of the Society of Engineers of Liège. A melancholy interest attaches to a paper which is down on the list, "On the Manufacture of Coke," by reason of its author, M. R. de Solderhoff, having died suddenly while reading a paper "On the Progress of Coking" at the meeting of the South Wales Institute of Engineers at Cardiff.

STREET IMPROVEMENTS IN LEEDS.

THE Leeds Corporation are about to carry out extensive street alterations. Some of the more important thoroughfares in the centre of the city, says the *Leeds Mercury*, such as North Street, Vicar Lane and Meadow Lane, are to be widened, and thereby adapted to the traffic requirements. Every citizen is conscious of the necessity for these improvements. Thoroughfares that sufficed twenty years ago are now much too narrow. When Boar Lane, some seven-and-twenty years ago, was made 25 yards wide, it was no doubt thought that it would accommodate the traffic for at least half a century, whereas it has been inconveniently crowded for a number of years. Briggate has been the same. The fact of the matter is that 25 yards is not sufficient for two lines of tramways, much other vehicular traffic, and tolerable footways. Such a width in the heart of the city is not equal to present requirements, to say nothing of the future; and, judging by its growth, which no depression of trade seems to check, Leeds is going to be a very much bigger place than it is now. With enterprises in hand like those referred to, it is important that this continuous expansion, and all that it means so far as street traffic is concerned, should be borne in mind. It would be a huge mistake to provide only for the present. Where property has to be acquired for the purpose, as in the case of the streets to be widened, there is, as a rule, very little difference between the cost of making a thoroughfare 20 yards and that of making it 25 yards wide. In both cases the front buildings must be acquired, and these are the most costly. From every point of view, the advantage to be derived from the additional width far transcends the extra cost.

These considerations ought especially to be allowed to weigh in dealing with Vicar Lane and North Street. When

the widening of these streets was first talked of it was thought that if they were made of a uniform width of 14 yards the requirements would be met. It is now felt that nothing less than 20 yards will suffice, and that, we believe, is the width sketched upon the plans. If it be practicable, such important thoroughfares as these ought not to be less than 25 yards wide, and the widening ought to commence at Duncan Street, at the junction with Briggate, and be continued along New Market Street, Vicar Lane and North Street. The plea may be based on more than one ground. Those who have given consideration to the extension and general improvement of our tramway system are agreed as to the desirableness of the cars from Meanwood, Chapelton and Roundhay coming into the city by one route and leaving it by another. This is requisite for the relief of the vehicular traffic in Briggate, which has at present to serve both for the incoming and outgoing cars, and which, as has been said, is too crowded. The greatest care is required by the drivers of the tram-cars, buses and other conveyances in going along that thoroughfare to avoid collisions. Frequently there is not more than 3 or 4 inches between the passing vehicles, whilst with a line of cabs down the centre and an almost continuous stream of vehicles on each side of it, people wishing to cross have to keep a very sharp look-out. Some day the enterprise of the city may be equal to the widening of Briggate; but that is not contemplated now, and it is necessary that the best should be made of present circumstances. It is clear that considerable relief would be afforded by providing a loop-line for the cars coming into the city from the suburbs named, and by reserving Briggate for them on the return journey. Vicar Lane, New Market Street and Duncan Street can be utilised for the purpose; but in order to make satisfactory provision the width of these streets should not be less than 25 yards. And such a width is desirable also because these thoroughfares form two of the principal approaches to the markets and must accommodate much other traffic. The same remark applies to North Street, where drivers of vehicles have also to be exceedingly careful, and where collisions are too frequently imminent.

These should be regarded as sufficient reasons for making North Street, Vicar Lane, New Market Street and Duncan Street 25 yards wide. But there is another. The greater width would naturally enhance the value of these streets for business purposes, to which they will almost exclusively be devoted. The owner of property in them would gain, and so too would the city, for the one would be able to command a



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higher rent, and the other an increased rateable value. The contiguity of the market as well as the tramway traffic would insure their being much frequented. Then need it be asserted that the appearance of the centre of the city would be greatly improved by making these main arteries wide? When a large amount of money is to be spent on such work, that should surely be kept in view. All these advantages are to be gained by pursuing an enlightened and spirited policy. What is to be achieved by adopting a plan less commensurate with present, not to say future, requirements? We should save the cost of taking a few additional yards of land backwards from the street, or rather we should have this land to sell after the widening was carried out. The sale of surplus lands in Leeds, following improvements by the Corporation, has not in all cases proved a very lucrative business for the vendors. It is true that the land would comprise the frontage, and in such thoroughfares it should fetch a good price. But in the other case there would, in most instances, still be a frontage to dispose of, and the street being five yards wider, and therefore affording greater advantages for business purposes, the rate obtained per yard should be proportionately higher. Looked at from whatever point of view the gain to the city, from what would soon be generally regarded as the more prudent policy, would far outweigh what would be saved by the other course. As to the feasibility of the larger scheme, it is understood that it could without serious difficulty be carried out. The notices to treat have been or are about to be served by the Corporation upon the owners of the property required, and there is yet ample time to consider this important question. In the interests of health, of commerce, and of the general prosperity of the city, it is essential that the main arteries should not be of less width than that we suggest.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-seventh annual meeting of this Institution took place on Thursday, July 26, at the offices, 35 Southampton Row, Bloomsbury. Mr. George Plucknett, J.P. (hon. treasurer) occupied the chair, supported by Messrs. Thomas Stirling, C. Russell, Robt. Perkins, and other friends of the charity.

Major Brutton (the secretary) read the annual report, which states that the committee consider the Institution is progressing, but they do not withhold the fact that it needs increased income, so as to provide for all those who, from

unavoidable causes, are of necessity obliged to seek its benefits. Thus, from want of sufficient income the committee are unable to recommend for election all who apply and are eligible, this being the more to be regretted as most of them are of an age which pleads for immediate relief. There are doubtless many builders in the Metropolis and its environs who are in easy circumstances, but who have never contributed to the funds of the charity; nevertheless, the committee hope such persons may be induced to subscribe, as contributions from them would secure provision for all fit applicants. There are now fifteen men and thirty-three women depending upon the Institution. The preponderance in the number of females is in consequence of the widows of pensioners having been made pensioners on the decease of their husbands, in accordance with the rules. During the past year five male and two female pensioners have died; one male and three female pensioners have been elected. The late Mr. Thomas Robinson, formerly a partner in the firm of Messrs. William Cubitt & Co., has bequeathed 1,000*l.* to the Institution, which, according to the rules affecting legacies, will be invested in consols, and added to the other funded property belonging to the charity. The committee also express their thanks to Mr. George Haward Trollope for the successful exertions he made in his presidential year to obtain a substantial sum for the Institution, this object having been accomplished by Mr. Trollope's influence and liberality. The committee had the gratification to intimate that Mr. Basil Pym Ellis, of the firm of Messrs. Lucas & Aird, had consented to be the President for the ensuing year, and that he would preside at the annual dinner to be held on November 18 next, in the hall of the Worshipful Company of Carpenters, London Wall.

Mr. Thomas Stirling moved the adoption of the report and balance-sheet.

Mr. Robert Perkins seconded the motion, which was agreed to unanimously.

The thanks of the meeting were given to Mr. G. H. Trollope for his support and services during the past year, and votes of thanks were also passed to the vice-presidents and trustees, and to Mr. Plucknett for his valuable services, he being again elected treasurer.

A vote of thanks was passed to the committee, and the retiring members re-elected, with the addition of Mr. Trollope. Thanks were also voted to the auditors, who were reappointed.

On the motion of Mr. Stirling, Mr. Basil Pym Ellis was appointed president for the ensuing year, and a vote of thanks to the Chairman closed the proceedings.

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MASTER BUILDERS OF GREAT BRITAIN.

THE National Association of Master Builders of Great Britain held its thirty-third half-yearly meeting in the Mayor's dining-room, Town Hall, Bolton, County Alderman John Bowen, J.P., Birmingham, president, in the chair, and representatives present from London, Liverpool, Birmingham, Manchester, Huddersfield, Northampton, Derby, Leicester, Bradford, Leeds, Bristol, Hull, Preston, Bolton, Wigan, Burslem, Hanley, Tunstall, Longton, Walsall and Southport.

The Mayor of Bolton, Alderman Nicholson, who was received with loud applause, delivered a short address to the representatives, expressing the pleasure it afforded him by being present at such an enthusiastic gathering; he also commented upon the splendid work executed by builders, of which their Town Hall, admired by everyone, was a specimen, and congratulated the Association upon having such a representative meeting.

The Mayor having retired, Mr. Bowen resumed the chair.

The Council reported having issued to the members the customary tabulated statements of hours worked, state of trade and supply of labour in the principal towns in the United Kingdom.

The report for the past half-year was read and discussed, and ordered to be printed and circulated.

The treasurer, Mr. C. W. Green, Liverpool, in submitting his statement of accounts for the past half-year, congratulated the Association upon its sound financial condition.

Mr. Stanley G. Bird, London, stated that the case of *Temperton v. Russell* and the Trades' Unions of Hull, which was entered for the House of Lords, was practically at an end; the deposit to cover costs on the part of the Trades Unions had not been forthcoming, consequently the further hearing of the case had been disallowed.

With regard to the London Streets and Buildings Bill, it had now been referred to the select committee of the House of Commons, but in a very different form to that originally introduced; in fact, there had been altogether ninety-two amendments, of which eighty had been accepted.

The Council reported that the form of contract now under consideration had not yet come to a satisfactory issue, but it is hoped that the Royal Institute of British Architects and the Institute of Builders, who have the matter in their hands, will do their utmost to bring the matter to a close as speedily as possible.

Mr. Robert Neill, jun., Manchester, also gave some valuable information on this subject.

Alderman Jessop, Huddersfield, gave a short description of the dispute with the masons, and expressed his opinion that the rule, now in force in many places, prohibiting worked stone being brought into the town, acts very prejudicially to all parties concerned, and expressed a hope that the members would do all in their power to get such an objectionable rule as this expunged.

Several other matters of special interest to the building trade were brought forward and discussed, and it was decided to hold the next meeting at Birmingham.

A hearty vote of thanks was accorded to the Mayor for his courtesy and kindness in granting the use of the room in the Town Hall for the meeting of the Association.

A vote of thanks was also accorded to County Alderman J. Bowen for his services as chairman.

During the afternoon several of the representatives were conducted over a spinning mill, and in the evening entertained at dinner by the Bolton Master Builders' Association.

DEATH OF A CONTRACTOR.

THE *Staffordshire Advertiser* records the death of Colonel Field, which took place recently at his residence at Shelton Priory, Shrewsbury. The deceased gentleman was a son of Mr. William Field, and was born in 1812 at Pipe Ridware, in the neighbourhood of Rugeley. He was brought up to the medical profession and practised at Rugeley, and was house-surgeon at the North Stafford Infirmary for several years. In the course of his attendance upon the men constructing the Trent Valley Railway he was brought into contact with the late Thomas Brassey, the famous railway contractor, and subsequently became his brother-in-law (Mr. Brassey and Mr. Field marrying two sisters), and was largely engaged with him in the construction of most important works. Mr. Field went to reside in Shrewsbury in 1851, subsequently taking up his abode in the house now occupied by the Bishop of Shrewsbury, and at once became connected with the railway enterprise of the neighbourhood, and was associated with Mr. Brassey in the construction of the Shrewsbury and Hereford, Shrewsbury and Crewe, Severn Valley, Wellington and Market Drayton, Leominster and Kington, Craven Arms and Knighton, Tenbury and Bewdley, and Wenlock and Craven Arms railways, besides

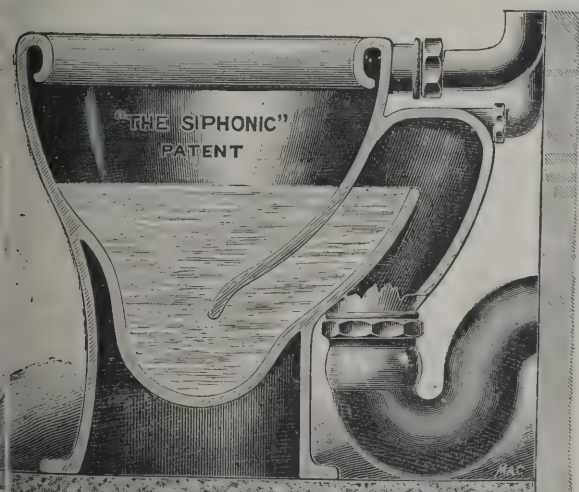
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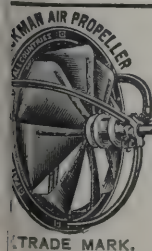
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others in the North Stafford district. He was one of the promoters of, and the contractor for, the Stafford and Uttoxeter railway, now amalgamated with the Great Northern system. It was at the large railway works at Coleham, in connection with the Shrewsbury and Hereford Railway, that the 1st Shropshire Artillery Volunteers was first formed, in which Mr. Field took the greatest interest, and of which he was colonel for many years, and upon which he spent large sums of money.

BRICK PAVEMENTS.

A PAPER on "Country Roads," which was prepared for the Engineers' Club, Cincinnati, by Mr. M. D. Burke, C.E., has been brought out in pamphlet form by Messrs. Robert Clarke & Co. The author, before recommending the adoption of brick pavements in Avondale, obtained samples of the various paving bricks manufactured in the United States, and submitted them, as well as other materials, to severe tests. The results he obtained are remarkable, and are worth the attention of municipal engineers and road surveyors in this country. The following extract on pavements in general will suggest the author's method of treating his subject:—

The office of a street pavement is to provide a wearing surface, which shall fulfil the following conditions:—

1. It must present a secure and pleasant footing for animals.
2. It must have sufficient smoothness to render travelling in carriages agreeable, and traction easy and as nearly noiseless as is practicable, for all descriptions of wheeled vehicles (excepting those provided with flanged wheels).
3. It must be of such form and material that liquids falling upon it will quickly flow from it into proper conduits, and must furnish no permanent lodgment for street filth of any kind.
4. It must be capable of sustaining without change of form any and all loads usually transported on public highways.
5. It must be reasonably durable, both as against the attrition of street traffic, and the destroying or dissolving action of the elements.
6. It must be economical; that is to say, sufficient comfortable use must be obtained from it to make it worth both the cost of construction and maintenance.
7. It must be capable of removal and replacement, or repair from failure at reasonable cost, and with materials

and appliances within the control of the street repairing department.

A study of these conditions at once reveals the reason why the "paving problem" is of such an intricate nature that it has so long remained unsolved, as well as a cause for so many unhappy failures in its attempted solution.

For the first and second conditions, the dirt road in good repair stands without a rival, but it meets no other requirement, hence its use is restricted to race tracks and country roads, which, like canals, are only navigable when the weather conditions are favourable.

For the second, third, and fourth conditions, the asphalt pavement on proper foundation appears to be better fitted than any other that has come into such general use; but many persons say that it does not properly meet the first requirement, criticise it severely as to the fifth and sixth, and affirm that it utterly fails to meet the seventh.

Stone block pavements meet the first requirement, but indifferently; utterly fail in the second and third, when properly constructed; are better adapted to comply with the conditions of the fourth, fifth, and seventh than almost any other description of city street, but when a high charge for transportation is to be added to the cost of preparing the material they fail to meet the sixth condition.

Wooden block pavements meet the first, second, fourth and seventh conditions fairly well, when made of suitable materials well combined; but, as they have been built in this country, have signally failed to meet the third condition, and have fulfilled the fifth and sixth but very indifferently.

The boulder or cobble-stone pavement has been with us so long, and has been treated so badly, that familiarity with it has bred a species of contempt that is hard to overcome. It has become popular to consider it an all-round failure, yet it meets the first and seventh conditions fairly well, and so far as the material is concerned, it stands unrivalled in the fifth. In many of our cities where horse cars have been operated for the past twenty or thirty years, and the street railway companies are required to maintain the pavements within their tracks, the boulder pavements are still retained between the rails, while the residue of the streets have been paved with other materials, because in that position they are said to meet all of the conditions named, excepting possibly the second and third, better than any other substance yet offered for the wearing surface of roadways. This saying, however, does not appear to be anything more than an expression of opinion, which

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cannot be sustained by any process of reasoning. The cobblestone can be given no definite bearing on any foundation; it cannot be held in position by any bond that can be given in construction. It does not present a suitable surface for vehicular travel, or that can by any process be kept free from filth; yet it does not wear out, is easily restored if loosened from its place, and it does answer very well for street car horses to travel upon.

Broken stone or macadam as commonly used, of mingled limestone and shale, meets none of the requirements. If, however, it is clean refractory material, properly prepared and combined by rolling, it fulfils all the conditions except the third (and even that reasonably well), providing the traffic is moderate, and the repairing is promptly and efficiently done. It may be set down as an established fact, however, that when a macadamised street is dug into for any purpose that it is never properly replaced.

No one of these conditions can be entirely ignored, yet it is obvious that no pavement yet devised fully meets all of them. Could the first be ignored, it would be an easy matter to cover street surfaces with iron or steel plates that would fully meet all the others, but plainly this cannot be done. The surroundings of the pavement and the extent and nature of the traffic to which it is to be subjected, must be considered in order to decide which of the conditions shall be allowed to determine its character. The first, that of furnishing a secure and reasonably comfortable footing for animals, can in no case be ignored, and in many instances must control all other considerations. Wherever the pavement is to be used as a thoroughfare for vehicular traffic at fair rates of speed, or when time, pleasure driving, or quietness become elements of importance, then the first and second conditions must be met, and other features may or may not be caused to yield to their requirements. But the preservation of life and health is the essential cause of business activity, hence the third condition, that of maintaining correct sanitary conditions, should never be neglected.

To those at all familiar with street construction it is obvious that the wearing surface, or pavement proper, cannot, and does not in itself, support the loads brought upon it, but that it more or less successfully resists the impact and abrasion incident to the traffic, and transmits the weight directly to the bed or foundation upon which this surface material has been placed. It follows therefore that the fourth condition can be met by any description of paving material which has sufficient hard-

ness to retain its form under the pressure of street traffic by merely placing it on a properly-prepared foundation; and further, that, unless the pavement shall be placed upon a bed capable of sustaining under all conditions the loads brought upon it, the surface will yield regardless of the material of which it is composed, and that this condition not being complied with, no essential feature of a good street surface will remain. Failure to meet this condition is the error most commonly committed in the building of pavements. In this latitude the winter frosts penetrate to a depth of from 1 foot to 3 feet, or, when not acted upon by frost, the subsoil drainage is seldom so thoroughly efficient as to prevent the changing of the ground from a firm unyielding soil to one of almost complete saturation, thus materially affecting its sustaining power. It therefore follows that no pavement which is to be subjected to a heavy traffic at all seasons of the year can be relied upon to retain the form originally given it, unless the foundation or bed upon which it is placed shall either be carried below the action of the frost, say 3 feet or more, or be so constructed as to distribute the weights of passing loads over sufficient areas to enable a comparatively weak subsoil to sustain them. The deep foundation is the ancient, and undoubtedly the most durable method, having apparently been the ordinary practice with the Romans, but the distributing coating is far more economical, and hence has become the established modern practice.

Two methods are in vogue. First, to drain the sub-roadway as efficiently as is practicable, grade it to the proper form, compact its surface by rolling, and cover it with a layer of mingled broken stone and gravel, which is made smooth and firm by flooding and rolling with a steam roller, the layer of metal being from 6 to 12 inches in thickness, according to the requirements of the locality or the specifications. On this layer or "foundation" is spread the bed of sand in or upon which the pavement is set. Sometimes broken stone alone, and again gravel only, is used for the bottom course. This style of "foundation" is used very extensively for all descriptions of pavements excepting asphalt. With brick pavements the practice of placing a layer of bricks flatwise on the bed of sand, covering them with a thin coating of sand and paving on it the wearing surface on edge is quite common, and produces what is called the "two course" pavement. Still another method consists in covering the layer of sand with tarred boards, upon which the sand cushion and brick on edge are paved herring-bone style, producing the



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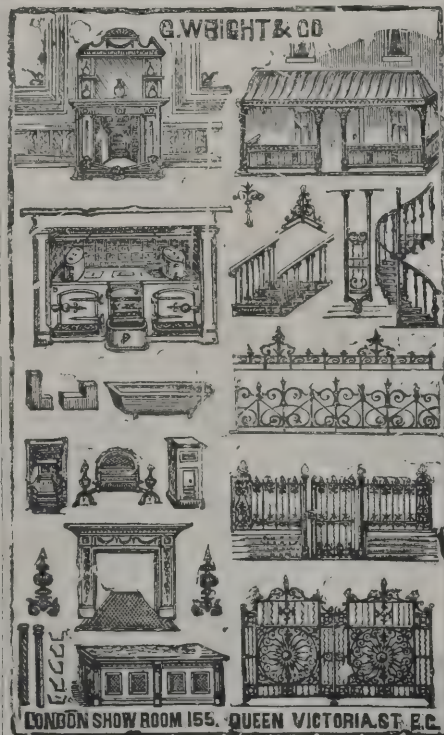
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"Hale Pavement." In this, however, the broken stone is generally omitted, the boards being separated from the subsoil by from 4 inches to 6 inches of sand only. These expedients tend to better the distribution of the weights brought upon the pavement, and have the merit of economy in first cost, but they are obviously inadequate except where the subsoil is exceptionally good and the traffic very moderate. The method of combination is quite defective. When gravel is used that is free from loam it will not compact under the roller, and if it does contain loam the water which comes from the subsoil and percolates through it is liable to carry the soluble substances with it down the gradients, and leave the pavement unevenly supported. When broken stone and gravel, or broken stone alone, forms the foundation course, it is expected to be porous and act to some extent as a subsoil drain. The voids, however, are liable to become the receptacles of the clay from beneath which is brought up, or rather the stones brought down by the pressure upon the pavement, or they will be filled by the sifting down of the bedding course of sand caused by the jar of the travel, and this escape of the sand will leave the blocks unevenly supported. All of the varieties described in this first method are extensively used, and are made more or less expensive and durable, or cheap and temporary, as they are carried to greater or less depths, and as the work is thoroughly or carelessly done. But they are so constructed that natural causes would alone destroy them in a comparatively brief space of time, and when the forces of nature are aided by the disturbances to which the sub-grade of the street is ordinarily subjected and the traffic upon the pavement, it follows that the life of such a foundation seldom exceeds the duration of the wearing surface, and the failure of the former very frequently accelerates the destruction of the latter.

The second method consists in preparing the subsoil by grading and rolling as before described, and placing upon it a layer of hydraulic cement concrete to serve as a foundation for the pavement. For equal volumes the cost of the concrete is about three times that of the broken stone or gravel; but from one-half to two-thirds of the amount is required, hence the expense of the concrete foundation is one and a half to twice that of the broken stone or gravel. When properly made and undisturbed, it will not yield to the action of the weather, and the renewal of the pavement need extend to the wearing surface only. The expense of cutting through and replacing the concrete when the street must be opened for any purpose is much greater (perhaps two to three times) than in the other

forms of foundation, but such work can be done without serious injury to the remainder of the street; and when repairs are properly made the opening of the pavement and its foundation is less injurious to the street having a concrete foundation than the one that has it not, because the concrete base will support the pavement over small cavities, while the broken stone or gravel will sink into them.

The thickness of the concrete varies with the requirements of the traffic and other conditions, from 4 to 8 or more inches. The ordinary practice is to use natural cement in its composition, and make the coating 6 inches in thickness for roadways of medium traffic without car tracks. The condition of the subsoil should, however, be considered in determining the depth of concrete, for where it is soft or spongy or trenches are to be spanned, a greater amount will be required. A concrete foundation is an absolutely necessary beginning for any really good and durable street pavement, and even for work of medium character and price it is economical. Pavements of sheet asphalt are always placed on concrete foundations, the wearing surface being separated from the cement by a cushion coat, ordinarily about half an inch in thickness.

Stone, asphalt, wooden block, or brick pavements are usually placed on a layer of sand from 1 to 2 inches in thickness over the concrete, but the practice regarding the cushion coat is by no means uniform, varying from an actual bedding of the blocks in the cement mortar to 2 or even 3 inches of sand; but the general custom in this country appears to be in favour of the sand cushion, convenience in construction and repairs, and the theoretical elasticity of surface being in favour of that combination. The choice of the sand to be used is of more than ordinary importance, since if it contains a considerable percentage of soluble substances, or is alternately coarse and fine in different places, displacement is likely to occur, and the pavement will become uneven.

All block pavements, whether of stone, wood, asphalt, or brick, should be as closely placed as is practicable, and the interstices filled with a non-absorbent material. Possibly a narrow spacing may be required on gradients paved with sawed wooden blocks to furnish footing for animals, but the wide spacing ostensibly for this purpose so frequently seen in all these varieties of pavements is undoubtedly bad practice, since it so materially reduces the resistance of the material composing the wearing surface, facilitates the chipping from the angles, and produces an uneven, noisy street, with cavities to receive and retain filth.

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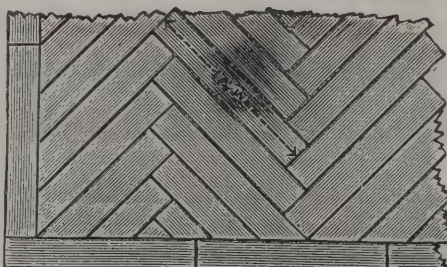
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TEQUIQUIAC TUNNEL, MEXICO.*

THE problem of the drainage of the valley of Mexico has occupied the attention of the inhabitants from the time of its conquest until now. The present project was begun by the Emperor Maximilian, but with the fall of the empire there was a complete stoppage of all works until 1885, when a special drainage board was established. Arrangements for a loan were made in 1888 and the work taken in hand by the present contractors. At that date 1,639 yards of the tunnel had been completed and four shafts were down to the tunnel level, with others partially completed. The quantity of water to be dealt with was under-estimated; at one time it reached 1,000 gallons per minute and the expense was very great.

The small size of the shafts, the shape of the tunnel and the character of the ground were all obstacles to the prosecution of the work. There were twenty-four shafts spaced about one-fourth mile apart, with an average depth of 175 feet, the deepest being 300 feet and the shallowest 65 feet.

The city, as is well known, is in a basin surrounded by mountains, so that there is practically no exit for the water, and it is all drained into Lake Texcoco. The object of the works is twofold—to control the level of the water in the lakes and in the valley, to get rid of any injurious surplus, and to form an outlet to storm waters and sewage. The works consisted of a canal 35 kilometres (21·74 miles) long and a tunnel to kilometres (6·21 miles) long.

The first effort made was to connect the various shafts as quickly as possible, so as to afford an outlet for the waters through the open end of the tunnel. While this was being done, no work, as a rule, was attempted in the same run of ground, as it was found to delay more or less the progress of the heading. As soon as two shafts were connected, tunnelling could be done between them, care being taken not to block the water. To make the greatest progress with the work, it was necessary to obtain as many working faces as possible; hence, at some convenient spot at the heading between the shafts, break-ups were made through the heading, and a length of tunnel opened by which means two more faces were obtained to work from. The number of these depended upon circumstances; usually two, or sometimes three, break-ups

were made between two shafts. Two were found to give the most convenient working. By this means the progress of the tunnel was very rapidly increased, as each face would average 60 to 90 feet per month.

The tunnel section was flattened at top and bottom, the chord of the arc being approximately the same length as the height. The flow was estimated to rise to the spring of the arch, giving a depth of water of 9 feet, with a calculated velocity of $4\frac{1}{2}$ feet per second and a discharge of 200,000 gallons per minute, the grade being 1 foot in 1,380 feet.

The arch consists of four concentric rings of bricks. The invert and side walls are constructed of artificial blocks, with a backing of volcanic stone rubble masonry. The thickness of the side walls, including backing, is 18 inches, and the invert has a thickness of 1 foot. The blocks are made of one part Portland cement and three of sand.

The ground through which the tunnel is driven is of very unusual character. There is no regularity in the strata, and nothing to indicate what will be found at any particular point in the line. The formation is for the whole distance of volcanic origin. One of the rocks found in large quantities is tepetate. Sometimes this is very hard. The greater part of the ground was of soft compact material, which on exposure to the air crumbled and swelled, thus throwing great weight on the timber. The remainder consisted of sand, both compact and running, and boulders. Water was always met with in large quantities in the tepetate and sand formations, while the soapstone formations were usually dry. Potholes were frequently struck, from which water would flow out with great force, bringing much sand, mud and stone, sometimes drowning out a pit and even tearing out the track and twisting up the rails.

The local workmen were unable at first to attend to the timbering without being closely watched by English miners both night and day. After a time they learned the general method, but constant watchfulness was necessary in all heavy lengths. They have improved wonderfully, however, and are now remarkably quick and handy. The best progress was made by working double lengths. This system required that a bottom heading should have been previously driven. The system of double lengths has been very successful; as much as eight lengths in one face, or 120 feet of complete tunnel, have been constructed per month. It requires extra care in timbering. The bottom headings were $6\frac{1}{2}$ feet high, 4 feet wide at the top in the clear and 6 feet at the bottom in the clear. As a rule the bottom heading was 2 feet above the invert of the

* From a paper by Mr. A. J. Campbell and Mr. F. W. Abbot, presented at the Niagara Falls Convention of the American Society of Civil Engineers.



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tunnel, to make room for the drainage. A drain 2 feet deep was cut in the bottom. The average daily progress in the bottom heading was $5\frac{1}{2}$ metres. The heading was usually built to one side of the centre to make room for the tunnel traffic when the tunnel was being constructed at the same point. By paying close attention to details, increasing the pay for work in the heading, the introduction of eight-hour shifts, &c., the progress of the work was very greatly increased.

The care of the water was one of the greatest difficulties met with. The total discharge of water at the tunnel mouth varied from 1,500 to 3,000 gallons per minute. At first two 12-inch pipes were sufficient to carry water, but later on when the pumping was increased, these had to be largely supplemented and a large launder used, which seriously interfered with the small space available for the masons. The making of dams where the ground was soft was very difficult. Finally a hollow board dam made to fit the shape of the invert proved very successful. This could be put in position quickly and weighted down with clay placed inside, and was tight and effective. Ventilation and the handling of material for construction were carefully attended to. The cost of the tunnel finished during the past year has averaged from 650 dols. to 700 dols. per metre. During the year ending September 15, 1893, there were 4,421 metres of heading driven and 2,037 metres of tunnel built, leaving 900 metres of heading to be driven and 2,667 metres of tunnel to build to complete the work. The greatest advance in any one month was 200 metres of heading and $55\frac{1}{2}$ metres of tunnel advance on any one face.

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"WHILE I was in Germany last year," says W. L. Burgess, of New Haven, writing to the *St. Louis Globe Democrat*, "I came across several walls surrounding some of the public institutions that were constructed out of cast-iron bricks. These bricks certainly have many advantages over the old-fashioned clay bricks, though they may not prove to be superior in all respects. In form and size these bricks resemble our ordinary bricks, but they are composed of cast-iron, and hollow. The shell is so thin that the brick weighs less than one made of clay. A wall is built of such material without the use of mortar, and no skilled labour is required in laying them. The upper and lower sides of the bricks are provided with grooves and projecting ribs, which fit into each other easily and perfectly,

and form a wall of great strength. There are also two large circular openings in the upper side of each brick, arranged so as to receive projections on the lower side of the brick that is to be placed above it. One of the projections is hook-shaped, which secures a solid hold. A wall of these bricks is put together very quickly. After the wall is built it is covered with paint. This closes all the cracks, rendering the wall air-tight, and prevents the bricks from rusting. The bricks are very durable, and a building constructed of them would be practically fireproof."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

13656. John Bousfield, for "Improved wrought-iron or steel roller frame for tops of sliding doors."
 13701. Thomas Peard, for "Improvement in spring centres for swing doors."
 13715. Ernest George Combe, for "Improved fastening to be applied to cellar-flaps, pavement-lights, coal-cellar gratings and the like."
 13782. Sidney Jennings and John Morely, for "Improvements in water-closets and in apparatus suitable for flushing the same."
 13810. Edmund George Kendall, for "Improved reversible window-sashes and frames."
 13860. David Dowson, for "Improvements in sash-fasteners."
 13888. Peter Ellis, for "Improvements in couplings for pipes."
 13889. Charles Lea, for "Locks."
 13950. Henry Swann, for "Sash stop and window-fastener or mortise-lock."
 13991. William Gibbin, jun., for "Improvements in and relating to window-sashes."

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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ARCLID.—Aug. 23.—For Extensions to Tramp Wards at the Workhouse. Mr. James Brown, Albert Street, Congleton.

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BASFORD.—Aug. 13.—For Building Two Cottages at Outfall Works, Greasley. Mr. Herbert Walker, Engineer, Newcastle Chambers, Nottingham.

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BRIDGEND.—Aug. 21.—For Building Cottage Hospital. Messrs. Lambert & Rees, Architects, Bridgend.

BURY.—Aug. 20.—For Construction of Brick Sewers. Mr. J. Cartwright, Borough Engineer.

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CO. DOWN.—Aug. 11.—For Building Two Dwelling-houses, Newcastle. Mr. Henry Hobart, Architect, Dromore, Co. Down.

CUDWORTH.—Aug. 17.—For Alterations and Additions to Schools. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

CWMGELLY.—Aug. 13.—For Building Mortuary Church. The Borough Surveyor, Swansea.

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EXETER.—Aug. 10.—For Galleries at Victoria Hall for Church Congress. Mr. E. H. Harbottle, Architect, County Chambers, Exeter.

GREAT ECCLESTON.—Aug. 18.—For Fitting-up Ground for Agricultural Society's Show. Mr. R. Hutchinson, Agricultural Society, Great Eccleston, Garstang, Lancs.

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HANWELL.—Aug. 18.—For Painting School. Mr. A. G. Langdon, 17 Craven Street, London, W.C.

ISLINGTON.—Aug. 13.—For Erection of Boundary Walls at Disinfecting Station. Mr. J. Patten Barber, Vestry Hall, Upper Street.

KILLMARSH.—Aug. 13.—For Building Twenty-one Cottages. Mr. John Allsopp, Architect, Worksop.

LISBURN.—Sept. 6.—For Construction of Extensive Works for the Water Supply. Mr. John Lanyon, Engineer, Northern Bank Chambers, Belfast. Mr. Richard Young, Lisburn, Town Clerk.

LITTLE LEVER.—Aug. 23.—For Sewage Works. Messrs. Lomax & Lomax, 11 Fold Street, Bolton.

LIVERPOOL.—Aug. 13.—For Making Roads. Mr. F. C. Everett, Public Offices, Green Lane, Tuebrook, Liverpool.

LONDON.—For Road and Sewer Works, Springfield Estate, Herne Hill. Mr. Charles Barry, Surveyor, 1 Victoria Street, Westminster.

LOSTWITHIEL, CORNWALL.—Aug. 13.—For Provision of about 195 Tons of 4-inch and 3-inch Cast-iron Pipes, including Laying and Jointing same in a Supply Main about Three Miles in Length, and the Distributing Mains in the Town, together with the necessary Valves, Hydrants, &c., and Construction of a Concrete Supply Tank to hold 41,000 Gallons, the Sinking of a Well, and the Provision of By-pass and Overflow Pipes, and other Works at the Source. Messrs. Jenkin & Son, Liskeard, Cornwall.

LUDLOW.—Aug. 29.—For Constructing Stoneware Pipe, Sewers, &c. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

MANCHESTER.—Aug. 18.—For Supply of Pumping Engines for Hydraulic Power Supply. The Town Clerk.

MERTHYR TYDFIL.—Aug. 15.—For Building Baptist Chapel and School. Messrs. Morgan & Son, Architects, Carmarthen.

MITCHELSTOWN.—Aug. 23.—For Building Dwelling-house, Out-buildings, &c. Mr. R. Fitzgibbon, Clerk to the Guardians, Mitchelstown.

MONK BRETTON.—Aug. 11.—For Additions to National School. Messrs. Wade & Turner, Architects, 10 Pitt Street, Barnsley.

NEW BARNET.—Aug. 14.—For Supplying Road Material. Mr. G. W. Brumell, Local Board Offices, Barnet.

NEWCASTLE-ON-TYNE.—Aug. 15.—For Lighting and Heating Church. Messrs. Marshall & Dick, Architects, 4 Northumberland Street, Newcastle-on-Tyne.

NEWTON TOWNE.—Aug. 17.—For Additions and Alterations to School. Messrs. J. Harding & Son, Architects, 51 Canal, Salisbury.

OTTERY ST. MARY.—Aug. 16.—For Rebuilding Tipton Bridge. Mr. H. Michelmores, County Council Offices, Exeter.

OVER WALLOP.—Aug. 18.—For Building School and Master's House. Messrs. J. Harding & Son, Architects, 51 Canal, Salisbury.

POOLE.—Aug. 29.—For Constructing Stoneware Pipe Sewers. Borough Engineer, Poole.

POWBURN.—Aug. 11.—For Additions to Plough Inn. Mr. George Reavell, jun., Architect, Alnwick.

PRESTWICH.—Aug. 10.—For Building Two Blocks at Asylum. Messrs. H. Littler & Son, Architects, 4 Chapel Walks, Manchester.

RAMSBOTTOM.—Aug. 13.—For Conversion of Premises into Public Offices, Board Room, &c. Mr. Arthur W. Smith, Surveyor, Callender Street, Ramsbottom.

ROCHDALE.—Aug. 15.—For Paving, &c. Mr. S. S. Platt, Town Hall, Rochdale.

SLOUGH.—Aug. 16.—For Supply of about 325 Tons of 12-inch Cast-iron Pipes, Bends, &c., delivered free to the Slough Goods Station on the Great Western Railway, or to the Stoke Road Wharf of the Grand Junction Canal. Mr. John Baker, A.M.I.C.E., Mackenzie Street, Slough.

SLOUGH.—Aug. 16.—For Supplying and Laying about 1,260 Yards Run of 18-inch Stoneware Pipe Sewer and about 880 Yards Run of 15-inch Ditto at Various Depths, and Construction of Manholes, Flushing Chambers, &c., in Connection therewith. Mr. John Baker, Engineer, Mackenzie Street, Slough.

SWINDON.—Aug. 13.—For Alterations and Additions to Lower Swindon School. Mr. W. Drew, Architect, Swindon.

TREHARRIS.—Aug. 17.—For Additions to Board School. Mr. John Williams, Architect, Morgantown, Merthyr Tydfil.

WHITTINGHAM.—Aug. 26.—For Painting the Asylum, Whittingham, near Preston, Lancs.

WORKSOP.—Aug. 25.—For Sinking Well. Mr. J. Allsopp, Engineer, Worksop.

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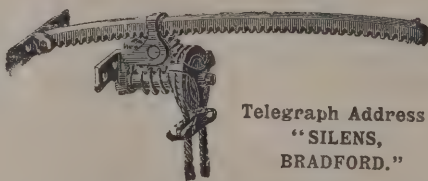
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WORTHING.—Aug. 27.—For Building Pumping Station, Chimney Shaft, Service Reservoir, Laying Cast-iron Mains, &c. Mr. J. Mansergh, 5 Victoria Street, Westminster.

WREXHAM.—Aug. 22.—For Building Bridge and Supplying and Fixing Fencing. Borough Surveyor, Guildhall, Wrexham.

TENDERS.

ASHBOURNE.

For Buildings, &c., Station Street. Mr. H. HARPER, Architect, Market Place, Nottingham. Quantities by Architect.
H. VICKERS, Nottingham (accepted) . . . £1,465 0 0

BATH.

For Building Homestead, &c., at Wellow. Mr. J. ACE BEYNON, M.S.A., Architect.

W. Colborne	£325	0	0
T. Ashman	315	0	0
F. Amery	298	0	0
G. Wibley	258	0	0
F. J. SEWARD (accepted)	255	0	0

HAMBLEDON.

For Building Classroom, &c., at Hambledon Board School, for the Hambledon School Board.

J. H. MEREDITH, Hambledon, Cosham (accepted) £279 19 11

HECKMONDWIKE.

For Forming, Draining, Paving, Kerbing and Flagging of Church Lane, for the Heckmondwike Local Board. Mr. JAMES SAVILLE, Surveyor.

Slinger & Sons, Cleckheaton	£833	10	0
Kaye, Huddersfield	749	0	0
Naylor & Sons, Cleckheaton	748	0	0
Horsfall, Liversedge	717	0	0
Jowett, Brighouse	671	12	0
W. & H. OLDROYD, Heckmondwike (accepted)	670	10	0
Parker, Bradford	660	4	0
Hall, Bradford	631	19	0
Surveyor's estimate	671	6	11

HORNCASTLE.

For Constructing Market Place, fitted with Iron Pens, on the Wong at Horncastle, for the Horncastle Local Board.

M. HATCLIFFE, Horncastle (accepted) £419 0 0

KILNHURST.

For Alterations to Outbuildings, for the Committee of the Co-operative Society, Limited, Kilnhurst.

J. A. Bower, Swinton £389 11 2
W. HOLT, Swinton (accepted) 320 0 0

KINSON.

For Making-up the Footpath in Poole Road (2nd section), for Local Board.

G. Troke	£146	6	11
H. C. Brixey	128	15	4
W. A. Guy	123	8	10
G. T. Budden	121	12	0
W. H. SAUNDERS & Co. (accepted)	118	18	0

LONDON.

For the Erection and Completion of the Ship Aground, Lea Bridge Road, for Mr. F. Hurdle. Messrs. EDMESTON & GABRIEL, Architects, 42 Old Broad Street, E.C. Quantities by Messrs. G. R. TASKER & SONS, 38 John Street, Bedford Row, W.C.

	Shop.	Fittings.
Kellett	£2,260	£72 10 0
Spencer	2,115	120 0 0
F. & H. F. Higgs	2,097	76 0 0
J. Carmichael	1,948	92 0 0
Godfrey	1,894	89 0 0
Young & Lonsdale	1,860	80 0 0
E. Toms	1,855	95 0 0
W. A. Prior	1,840	75 0 0
Godson & Sons	1,833	71 0 0

For Additions and Repairs to Houses in Bartholomew Square and Henry Street, E.C. Mr. E. B. PANSON, Architect, 7A Laurence Pountney Hill, E.C.

Johnson & Co.	£2,715	0	0
Young & Lonsdale	2,420	0	0
C. Ansell	2,320	0	0
Wynne	2,290	0	0
Garrett	2,170	0	0
Adams	1,986	0	0
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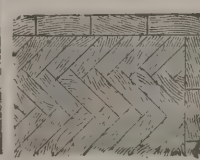
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For Erection of the Brook Fever Hospital, Shooter's Hill Road, S.E., for the Metropolitan Asylums Board. Mr. T. W. ALDWINCKLE, F.R.I.B.A., Architect. Quantities by:—Mr. W. T. FARTHING (Sections 1 and 2), Mr. R. R. BATSTONE (Section 3), Messrs. W. H. BARBER & SONS (Section 4), Mr. H. RILEY (Section 5), Messrs. CORDEROY, SELBY & CORDEROY (Section 6), Messrs. FOWLER & HUGMAN (Section 7).

Section 1.—Scarlet Fever Pavilions A, B, C and D.

Higgs & Hill, Crown Works, South Lambeth	£40,400	o	o
G. E. Wallis & Sons, Bexley Road Works, Maidstone	42,000	o	o
Leslie & Co., Kensington Square	39,965	o	o
J. Shillitoe & Sons, Bury St. Edmunds	37,860	o	o
Kirk & Randall, Woolwich	37,650	o	o
W. Johnson & Co., Limited, Wandsworth Common	37,589	o	o
W. J. Adcock, Dover	36,050	o	o
C. WALL, Ashburnham Works, Lot's Road, Chelsea, S.W. (accepted)	32,652	o	o

Section 2.—Scarlet Fever Pavilions, E, F, G and H.

Higgs & Hill	41,000	o	o
G. E. Wallis & Sons	40,665	o	o
Leslie & Co.	42,614	o	o
Kirk & Randall	38,275	o	o
W. Johnson & Co., Limited	38,079	o	o
J. Shillitoe & Sons	38,000	o	o
W. J. Adcock	36,490	o	o
C. WALL (accepted)	33,316	o	o

Section 3.—Isolation Wards and Workshops.

Leslie & Co.	13,325	o	o
J. Shillitoe & Sons	12,900	o	o
C. Wall	12,713	o	o
W. Johnson & Co., Limited	12,370	o	o
H. WALL & Co. (accepted)	12,347	o	o
Kirk & Randall	12,325	o	o

LONDON—continued.

Section 4.—Diphtheria Pavilions, &c.

Hall, Beddall & Co., Pitfield Wharf	£39,997	o	o
G. E. Wallis & Sons	38,185	o	o
Leslie & Co.	37,597	o	o
J. Shillitoe & Sons	35,400	o	o
Kirk & Randall	35,346	o	o
W. Johnson & Co., Limited	34,688	o	o
C. WALL (accepted)	30,347	o	o

Section 5.—Nurses' Home.

Leslie & Co.	24,680	o	o
G. E. Wallis & Sons	24,590	o	o
H. Lovatt, Wolverhampton	24,370	o	o
Higgs & Hill	23,500	o	o
Kirk & Randall	23,168	o	o
W. Johnson & Co., Limited	23,095	o	o
G. Godson & Sons, Kilburn	22,950	o	o
J. Shillitoe & Sons	22,000	o	o
C. WALL (accepted)	19,138	o	o

Section 6.—Portion of Administrative Block, Water Tower, Medical Superintendent's House, &c.

Leslie & Co.	28,521	o	o
W. Johnson & Co., Limited	26,318	o	o
J. Shillitoe & Sons	26,000	o	o
Kirk & Randall	25,951	o	o
C. WALL (accepted)	23,095	o	o

Section 7.—Portion of Administrative Block, Laundry, Boiler House, Steward's House, &c.

Leslie & Co.	23,515	o	o
Kirk & Randall	21,601	o	o
W. Johnson & Co., Limited	20,963	o	o
C. Wall	20,898	o	o
H. Wall & Co.	20,400	o	o
G. Godson & Sons	20,109	o	o
J. SHILLITOE & SONS (accepted)	19,750	o	o

For Installation of Electric Light, for Mr. J. H. Renton, 39 Park Lane, W. Mr. W. J. FRYER, Electrical Engineer. GRAHAM & BIDDLE, 463 Oxford Street (accepted) £534 o o

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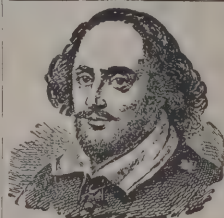
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R. & J. Shiers	£520	0	0
H. & E. Lea	450	0	0
Turtle & Appleton	427	0	0
Horton	419	0	0
Gregory	415	0	0
Johnson & Manners	378	0	0
Nicholson	375	0	0

W. JOHNSON & Co., Limited, Wandsworth Common (accepted) 354 0 0
Surveyors' estimate 379 0 0

For Building New Storey to Messrs. Carr's Ink Factory, Kentish Town. Mr. LIONEL SARGANT, Architect.

H. G. DAVENALL, Southampton Works, Gospel Oak (accepted) £400 0 0

For Installation of Electric Light and Other Works, for Mr. F. Samuels, 34 Bryanston Square, W. Mr. W. J. FRYER, Electrical Engineer

GRAHAM & BIDDLE, 463 Oxford Street (accepted) £445 0 0

MARKET HARBOROUGH.

For Building Six Semi-detached Cottages for the Market Harborough Land Society. Mr. HERBERT G. COALES, Architect.

R. Garfield	£1,565	0	0
E. Fox	1,530	0	0
E. Dexter	1,359	1	9
J. Main	1,331	11	0
F. BARLOW (accepted)	1,254	0	0

For Building Cottage at the Sewage Farm for the Market Harborough Great and Little Bowden Local Board. Mr. HERBERT G. COALES, Architect, Market Harborough.

J. Main	£230	18	0
T. Hickman	214	0	0
G. Garlick	209	0	0
W. PETTEFER (accepted)	200	0	0
J. Jennings	198	0	0

MARKET HARBOROUGH—continued.

For Building Two Semi-detached Villas for Mr. A. Carpenter. Mr. HERBERT G. COALES, Architect, Market Harborough.

Braxby	£675	0	0
Huffer	625	10	0
Main	606	10	0
Barlow	580	0	0
Garlick	575	12	5
Dexter	570	10	0
PETTEFER (accepted)	570	0	0

For Building Hosiery Factory, for the Market Harborough Land Society. Mr. H. G. COALES, Architect, Market Harborough.

F. Halliday	£1,954	0	0
E. Dexter	1,950	0	0
G. Garlick	1,945	0	0
W. Pettefer	1,937	0	0
J. Main	1,922	0	0
E. Fox	1,899	0	0
T. Hickman	1,891	0	0
W. Clow	1,835	0	0
F. BARLOW (accepted)	1,725	0	0
J. Fishburn	1,675	0	0

NEW BARNET.

For Making Roads, Sewers, &c., for the East Barnet Valley Local Board. Mr. G. W. BRUMELL, Surveyor.

W. Nicholls, Wood Green	£457	0	0
W. Butcher, New Barnet	424	0	0
Fry Bros., Greenwich	363	0	0
J. GRIFFITHS, Kingsland Road (accepted)	344	0	0
Porter, Mansion House Chambers	319	0	0

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For Building Classroom, &c., at New Hinksey Schools.

W. Rose, Oxford	£360	0	0
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G. H. Wheeler, Abingdon	295	0	0
W. H. Siarey, Tetworth	287	10	0
T. AXTELL, Oxford (accepted)	279	0	0

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For Building Two Dwelling-houses on the Tolcarne Estate, for Mrs. Grindon. Mr. WILLIAM J. JENKINS, Architect, Bodmin.

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For Laying-out Burial Ground and Building Chapel, for St. Michael's Burial Board. Mr. J. E. P. LADD, Architect, Main Street, Pembroke.

L. W. Brown, Pembroke £596 0 0

Davies & Morgan, Pembroke 498 0 0

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Jenkins, Radyr 578 10 0

Lewis, Whitchurch 569 4 4

G. & F. Couzens, Cardiff 496 10 0

W. WATKIN, Pontypridd (accepted) 470 0 0

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For Alterations to Congregational Church, Roath. Messrs. T. WARING & SON, Architects, 1 Charles Street, Cardiff.

Ashley £2,225 19 6

Latty & Co. 2,000 0 0

Davies 1,940 0 0

Jones Bros. 1,813 0 0

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Haines 1,550 0 0

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For Building Boys' School and Master's House. Mr. T. Potter, Architect, 49 London Road, Sevenoaks.

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Ransomes & Rapier, Ipswich	£285	0	0
G. Waller & Co., London	218	10	0
J. Blakeborough & Sons, Brighouse	165	0	0
H. Hollingdrake & Son, Stockport	159	2	6
Glenfield & Co., Limited, Kilmarnock	145	0	0

TUNBRIDGE WELLS.

For Building Electric Light Station and Chimney Shaft, Quarry Road, for the Corporation. Mr. ARTHUR ARDRON, Architect, F.R.I.B.A., 39 Victoria Street, Westminster.

Perkins & Co., London	£3,490	0	0
Simmonds Bros., London	3,404	0	0
R. Avar, Maidstone	3,053	0	0
Belham & Co., London	2,995	0	0
P. Peters, Horsham	2,810	0	0
LONGLEY & Co., Crawley (accepted)	2,789	0	0
Davis & Leaney, Goudhurst	2,786	0	0

WALTHAMSTOW.

For Building Fire-engine Station, High Street, for the Local Board. Mr. GEO. W. HOLMES, Surveyor.

R. & E. Evans, Peckham	£1,577	0	0
J. W. Best, Walthamstow	1,172	10	0
J. Holland, Leyton	1,141	0	0
T. White & Son, Bow	1,085	0	0
Slow & Punter, Leyton	1,035	0	0
Morrison & Goodwin, Southgate Road	997	0	0
J. A. REED, Walthamstow (accepted)	950	0	0

WILTON.

For Alterations and Additions to Wilton Free School. Messrs. JOHN HARDING & SON, Architects, Canal, Salisbury.

Hale, Salisbury	£490	0	0
Kellow & Smith, Salisbury	445	0	0
Elliott, Wilton	425	0	0
Beckett, Wilton	390	0	0
BRAZIER & WHATLEY, Wilton (accepted)	367	11	2

YSTRAD.

For Building Boys' Department for the Gelli Board Schools, Ystrad, for the Ystradyfodwg School Board. Mr. J. REES, Architect, Hillside Cottage, Pentre.

A. RICHARDS, Pentre, near Pontypridd (accepted)	£1,650	0	0
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VARIETIES.

A NEW anatomical building is about to be erected in connection with Queen Margaret College, Glasgow.

A COLLECTION designed to show the development of railway rails, from the early platways to the heavy rails now in use, is in course of arrangement in the machinery and inventions division of the South Kensington Museum.

ELECTRIC light has been introduced in the church of St. Martin on the Hill, Scarborough.

The County Buildings committee of the North Riding County Council reported on Tuesday that if it be found necessary to erect County Buildings on a new site, that numbered 2 on the plan is the most suitable. They had met five architects, and instructed them to prepare sketch plans and estimates of proposed new County Buildings. The plans and estimates had been lately received, and the committee proposed to refer them to Mr. Alfred Waterhouse, R.A.

THE Foresters' High Court meeting at Cambridge have resolved that "the contracting-out clause inserted in the Employers' Liability Bill would be detrimental to the best interests of friendly societies and their work."

THE technical instruction committee of the West Hartlepool Council have adopted the design of Mr. Cheers, of Twickenham, for new Technical Schools, but as objection to the expenditure of 12,000*l.* has been raised, the final decision on the subject has been postponed.

At a meeting of the Blackpool Town Council on Tuesday complaints were made that serious attempts had been made to interfere with the electric light supply and the running of the electric tramway during the busy season. Scientific measures had been taken to run the tramway current to earth, and to otherwise hamper the staff, the interference being of so damaging a nature that a special watch would have to be maintained.

MR. E. G. LOVEGROVE, the surveyor to the Corporation of Richmond, has been appointed the successor to Mr. de Courcy Meade as the surveyor to the Hornsey Local Board.

A DISPUTE between the vestry of St. Martin's-in-the-Fields, London, and the owner of the Lowther Arcade, in respect to the drainage of the arcade, came before a Divisional Court of the Queen's Bench on Tuesday. The judges decided that the obligation to execute the drainage works rested upon the vestry.

THE capital of the Dublin Artisans' Dwellings Company is to be increased by 50,000*l.* in order to erect additional buildings.

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1829.

THE badge and chain of office to be presented to Mr. Alderman Marcus Samuels, sheriff-elect, is being made at George Kenning's manufactory, Little Britain, E.C.

THE Turkish Department of Public Works has ordered the immediate repair of the old aqueducts of Solomon in Jerusalem. These aqueducts will bring the water to the city from the fountains of Arroul. A tunnel is to be built 3,750 metres long, and is to cost 80,000*l*.

THE *City Press* says that one of the turrets of St. Giles's, Camberwell, "is decorated with corbels representing the heads of Mr. Gladstone, who is provided with angel's wings; Lord Salisbury, who has a demon's ears and claws; Lord Randolph Churchill, who has acquired dragon's wings; Sir William Harcourt, and what appears to be Mr. Goschen, who is graced with horns, but whether those of the 'Horned Moses' or of a nether spirit is not apparent. This group of political corbels looks very odd as adorning a modern church. Evidently the sculptor had Liberal, not to say Home Rule, proclivities, to judge by his adornment of Mr. Gladstone. It is very strange how the execution of so remarkable a set of heads could have been allowed to adorn a sacred building in the nineteenth century."

ACCORDING to the same correspondent, few if any of Wren's churches in the City have their walls either parallel or four-square. Most likely Wren was obliged to follow, or chose to follow, the lines of the old foundations, and this was of course the case in the rebuilding of churches where much of the old edifice was built into the walls of the new. To take a few instances only, mention may be made of St. Stephen's, Coleman Street, St. Magnus, London Bridge, and Allhallows-the-Great. The first of these is but little troubled with right angles, and the west end is considerably wider than the east. In the case of St. Magnus the variation in width between the east and west ends is stated to be no fewer than 7 feet, and the last-mentioned is terribly askew. St. Margaret, Lothbury, and St. Michael Paternoster Royal also provide striking examples of this peculiarity, which is not altogether, however, a feature adding to their beauty, although it undoubtedly adds to their interest.

THE Westminster Schools, Hoole, near Chester, are being warmed and ventilated throughout by means of Shorland's patent Manchester stoves and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

BUILDING AND BUILDERS.

THE tender of Mr. H. Lovatt, of Wolverhampton, has been accepted for the Technical Instruction Buildings, which are to be erected at Stafford from designs by Messrs. Bailey & M'Connell, of Walsall.

THE Glasgow Building Trades' Exchange in Glasgow will occupy temporary premises at 30 Gordon Street. There are already about 120 subscribers connected with the Exchange, consisting of leading architects, measurers, builders and representatives of the various departments of the building trades in Glasgow and the west of Scotland. The premises include a general room for the use of all members, two sample-rooms, a room for members who wish to transact any private business and a secretary and directors' rooms. A large number of applications have been received for space in the sample-rooms, but no allocation has as yet been made.

CONTRACTORS' RISKS.

EVERYBODY who has had any experience in the sanitary, water or gas works of any of the old cities and towns in England is aware of the existence of drains, conduits and pipes, which were forgotten until they were revealed by the new operations. A case relating to one of these drains came before the Queen's Bench Division on Wednesday. Mr. Kellett, a contractor for drainage works in York, agreed to the conditions by which he was to "protect, support, restore and make good all houses, buildings, sewers, drains or other things which may be disturbed or injured during the execution of the work or in consequence of its construction." He was also to restore the sewers in case of accident in order to prevent the influx of sewage in the new works, and to accept all risks from floods. While driving an heading a old sewer which was unknown to the corporation and the engineers was broached. About the same time an extraordinary flood occurred, which, passing through the new shaft and heading, caused the old sewer to burst, and damage arose to the neighbouring buildings. A part of the river wall was also washed away, and in several of the streets houses were injured. When, as is usual, differences arose in settling accounts, and Mr. Mansergh, C.E., was employed as arbitrator, he came to the conclusion that the damage was not caused by any carelessness or neglect of the contractor or his workmen, or by non-compliance with the conditions. A case was stated at the



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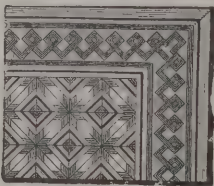
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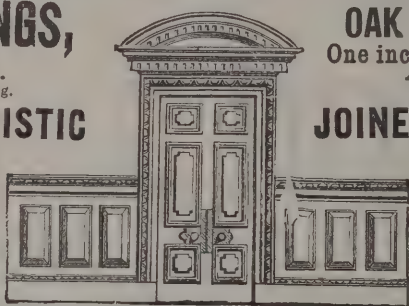
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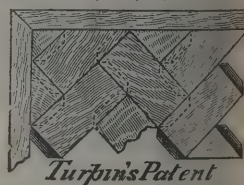
MARBLE

MOSAIC

PAVING.

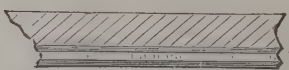
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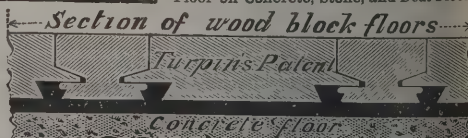


Turpin's Patent

System of Preparing for Laying inch Block Floor on Concrete, Stone, and Deal Floors



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Wood Backings



Turpin's Patent

Concrete floor

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desire of the Corporation of York. The judges considered that for the flooding in the vicinity of the old shaft and the consequent damage in the neighbourhood the contractor could not be held liable, but for the damage to river wall and to houses near the new streets their lordships came to a different conclusion. The latter part of the decision will cause some surprise.

LOWEST TENDERS.

At the meeting of the East Preston Board of Guardians on Tuesday a letter was read from Mr. T. P. Hall, of Southsea, whose tender amounting to 302*l.* 7*s.* 6*d.* for drainage works at the workhouse was passed over in favour of one for 305*l.*, as appeared from last week's *Architect*. Mr. Hall asked if the guardians were not in a position to accept his tender, why was he put to the trouble and expense of tendering? He could understand the usual clause with regard to the non-acceptance of the lowest or any tender as a safeguard against firms which the guardians knew could not carry out the work, but this had been wrongly applied in the present instance, for no reason could be given in the case of his firm. He pointed out that he had done work under the Board's surveyor before, and gave a list of well-known architects under whom he had also contracted, and said, considering the circumstances, he thought the Board should pay the expenses of his tender—3*l.* 3*s.*—for which he sent an account. One of the guardians said he did not wonder that Mr. Hall felt aggrieved. He considered the action of the Board ill-advised. The clerk was directed to inform Mr. Hall that his request could not be complied with.

WESLEYAN CHURCH, DUDLEY.

Two richly-coloured memorial windows have just been placed in the above church, one on either side of the organ chamber. The work has been admirably executed by Mr. T. H. Yates, stained-glass artist, of High Street, Smethwick. The subjects chosen for representation are the Crucifixion and Resurrection. In the centre of the former subject the figure of the Saviour appears suspended from the Cross, at the base of which are seen standing Mary and St. John. The figure of the dying Lord, in its general pose and careful treatment is strikingly effective, the facial expression and tension of the muscles being powerfully suggestive of the agony endured in His extremest moments. The other figures are equally successful in treatment, the intense sorrow depicted in the features, together with the dejected

attitude in which they stand, being thoroughly in keeping with the solemn sadness of the scene portrayed. The subdued tone of the background, with the buildings of the city quietly indicated, give additional value to the figures, which have just sufficient colour in the drapery to render the window rich and effective as a whole. In the Resurrection the treatment is naturally more vigorous. Here the risen Lord is represented as just having emerged from the tomb, at the entrance of which He stands, with the victor's banner in hand, Conqueror of death and the grave, while the Divine power and glory are symbolised in the clouding and golden rays by which He is surrounded. At His feet are the Roman soldiers, represented in deference to traditions as being asleep. In this window the colouring throughout is rich and cheerful, the ruby in the Saviour's robe being particularly rich in appearance, and gaining effect by the wise introduction of quieter tones in the dresses of the Roman soldiers. Each window has an ornamental border and base of classical treatment, in keeping with the character of the window, and forming an effective setting to the subjects represented. One window is the gift of Mr. Francis Downing, in memory of his wife, and the other is the gift of Alderman Job Garratt, in memory of his mother. In addition to these two memorial windows, the whole of the windows in the church have also been filled with stained-glass of an ornamental character; and, together with the artistic decoration of the interior, give to the building a very bright and attractive appearance.

THE STANDEDGE TUNNEL.

THE new double-line railway tunnel made through the Standedge Hills from Marsden to Diggle by the London and North-Western Railway Company, and the works connected therewith at each of those places, so far as they are completed, have been inspected by Major Yorke, Government Inspector of Railways, who gave his certificate for the opening of the new tunnel and works. The first sod of the new tunnel was cut on August 5, 1890. The tunnel is 3 miles and 60 yards long. The maximum number of men employed on the works has been 1,800. The work of boring the tunnel was of a stupendous character, the geological formation being millstone grit and Yoredale shale, with coal in a few seams too thin almost throughout to be worth separating. The character of the work may be judged from the fact that 120 tons of gelignite were used in blasting operations. The millstone grit removed was crushed and used for ballast for the permanent way.

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Let us commence with electrical motive power, and, in considering this subject, it may be useful to explain briefly the theory of electric motors, and for that purpose to refer to the magnetic field. The region through which a magnet exerts its influence is called a magnetic field, and Faraday's conception of lines of force flowing through a field helps us to understand the action of magnets on each other and on currents of electricity. By means of iron filings, I show you a plan or map of the field about a straight magnet; each particle of iron becomes a tiny magnet, and sets itself along the lines of force. Another diagram is produced in which the lines of force are shown crossing the space between the poles of a magnet opposite each other, which is the usual disposition of the poles of the field magnets of dynamos and motors.

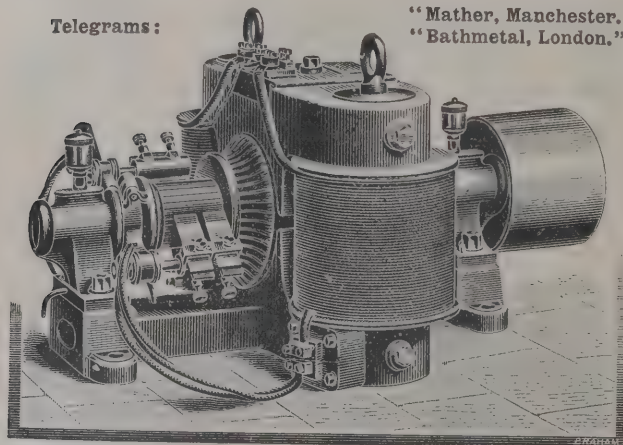
I will now refer to the effect produced in a moving conductor when passing through a magnetic field, which is, as you

will presently see, of great importance in a motor. Here I have a copper disc, capable of quick rotation; whilst it is in motion I suddenly produce an intense magnetic field about it, and as you see it is at once brought to rest. This is due to the fact that a conductor cutting lines of force has an electromotive force induced in it which can set up a flow of current, and as currents of electricity are attracted or repelled by magnets according to the direction of their flow, you see the action between the currents generated in this plate and the lines of force due to the magnet is such as to oppose the motion of the plate. Motors such as I am going to speak about are dynamo-electric machines capable of transforming electrical energy applied to them into mechanical energy, and this as a rule at any convenient point. When lines of force belonging to separate magnetic fields are in proximity, so as to permeate a common space, the lines due to these separate fields all tend to place themselves so that as many as possible have the same direction. In the model before you I can produce two such fields, one due to the current flowing through the field magnet, and another to that flowing through the armature. The field magnets being fixed and the armature being free to turn, if the fields are not coincident then the stress set up between them will cause the armature to respond to it, and turn so that the lines due to both fields may coincide in direction; when this occurs the armature would of course stop, but by altering the connections of the armature to the source of current just at this moment, so that coincidence is destroyed, the revolution of the armature is continued. The alteration in the direction of the flow of current so as to produce a lack of coincidence between the two lines is brought about by the commutator in this manner. The winding of the armature ring is continuous, but it is divided into sections, each section being connected to a plate or bar constituting a segment of the commutator. The segments are conveniently placed round the armature axle, insulated from it and each other, and thus disposed they form the commutator. The current is supplied to the armature by two brushes which bear on the commutator at opposite sides, and by placing the brushes in a suitable position the field produced in the armature may be sufficiently out of coincidence with that of the field magnet as to produce rotation in the effort to effect that coincidence. Suppose current is supplied to the armature by way of the brushes, it will divide, half of it going through one-half of the armature in one direction and one-half of it through the other half of the armature in the other, producing a field about the armature, but as the

* A paper by Mr. G. Binswanger, M.I.E.E., read before the Congress of Public Health (Section, Engineering and Building Construction), July 31, 1894.

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armature revolves the points of incoming and outgoing current are being continually moved, so that a moving field is the result, and as this means continuous stress, the rotation of the armature is maintained, and the power is greater as the stress is greater, the strength of the two fields determining this.

To put it in another way briefly, the north pole of the field magnet attracts the south pole of the armature which is produced near where the current, say, enters the armature winding, and the south pole of the field magnet attracts the north pole of the armature at the same time repulsion between the like poles of the armature and the field magnet is occurring, and the joint effect is that a couple is produced tending to turn the armature until the attracting poles coincide. The commutator, by shifting the points of ingress and egress of the current continuously, in effect moves the poles of the armature continuously, so that the attraction and repulsion is being constantly exerted and so maintain rotation of the armature.

Counter Electro-motive Force.—The law that a conductor cutting lines of force has an E.M.F. developed in it depending on the number of the lines and the speed with which it cuts them, operates in a motor so as to produce a force in the armature in a direction opposing the exciting force. On account of this counter E.M.F. the current which can be sent through a motor armature by a given E.M.F. varies with the speed at which the armature is running; if it be forcibly prevented from turning, the current is greatest, being simply due to the E.M.F. divided by the resistance, but when the armature is allowed to revolve, the current decreases as its speed increases. This tends to make the motor self-regulating as to current absorbed in proportion to load and as to speed, for if the motor is having heavy work to perform the speed tends to become reduced, and therefore the counter E.M.F. allowing more current to pass the armature, more power is given to do the increased work. Lighter work tends to allow the speed to increase, which develops more counter E.M.F. in the armature, reducing the current and consequently the power.

Alternating Current Motors.—With constant current supply there has been no difficulty in driving motors, and one of the advantages urged in its favour was this fact; but now that the alternating current, with its many other advantages, is so well to the front, alternating current motors are receiving considerable attention from our electrical engineers.

Many attempts have been made to produce such motors from designs like those of direct current ones, except that their field magnet cores had to be laminated as well as those of the

armatures. Owing to troubles with self-induction and magnetic lag, motors constructed in this manner proved to be most inefficient. The motors which run with good efficiency, and which are likely to be largely used in alternating circuits, have for their principle the induction of currents in closed or "short-circuited" coils in the armature by an alternating field.

Supposing the armature to be stationary and the field excited, the currents induced in the armature windings are neutral with regard to those of the field. As soon, however, as the armature is set in motion this neutrality ceases, and a turning effort is induced by the reaction of the fields on each other, which increases as the speed rises until synchronism between the two fields is approached. Although self-exciting, this form will not start, but if initially started it rapidly speeds up to a uniform rate, the direction of rotation depending upon the direction given at the start. By a recent addition the magnetic field has been made rotary by having two windings in the field magnets, differing in self-induction, connected in parallel; as soon as the motor has attained its proper speed one winding is cut out, and the motor continues to run as a single phase motor. The necessary difference in the self-induction of the field circuits may be obtained either by inserting condensers, resistances or coils having self-induction in series with one of windings, *i.e.* the one to be cut out when working speed is attained.

Let me now direct your attention to some of the main advantages of an electric motor over other motors at our disposal, such as steam, gas, oil or water-engines.

Simplicity.—There is absolutely no technical skill required to handle an electric motor. Turn a switch and it starts or stops; turn a multiple switch and by means of resistances the speed can be varied. No knowledge of pressure or water-gauges, of valves, exhaust, &c., is required.

Attendance.—The electric motor may be said to require absolutely no attendance beyond occasional oiling of its bearings; no stoking of boilers; no cleaning; hardly any repairs. It adjusts itself to any load within its range.

Range of Power.—A feature of the electric motor is the ease with which they may be designed to have the power of a watch or to that of the largest locomotive.

There is an example of a motor designed for winding an ordinary clock and here one of 5 horse-power.

Compactness.—In proportion to the power developed in an electric motor the space it occupies is extremely small. Its size depends largely on the speed its armature is intended to

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revolve at, but even at low speeds an electric motor is smaller than any other motor.

Safety.—A steam-engine with its dangerous boiler, a gas or oil-engine subject to explosion, could not well be placed by an architect inside a house. No fear of danger of any kind need deter you to put an electric motor right into a drawing-room as it is so absolutely safe.

Position.—An electric motor can be placed anywhere conveniently in a house; it requires little fixing, hardly any foundation; it is not unsightly, and owing to the fact that it can be started and stopped from any distance, it can be placed in ordinarily inaccessible places.

Cleanliness.—It is absolutely clean, not even the oiling of its bearings need cause any dirt or mess; can we say this of other motors?

Noiselessness.—Compared to a gas or oil-engine, an electric motor is quite noiseless; some of the alternating motors at high frequency issue a kind of hum, but direct current motors are quite noiseless.

Efficiency.—The efficiency of electric motors of the larger sizes is very good, and ranges from 60 to 80 per cent. As they are self-regulating there is little waste when run on small loads, but their main efficiency and economy lies in the fact that they consume power only when doing work.

With such a convenient and efficient motor at the disposal of the architect, we may expect to see it figure largely in many of his plans and undertakings. It must, I think, influence his future considerations in building our dwellings, public edifices and factories. A few such likely considerations occur to me.

Factories.—I feel confident that the invention of the electric motor will revolutionise the planning and building of our factories. At present our mills and factories for the most part are driven by steam power, and it is essential to bring the machines as near the source of power as possible, in order to avoid the cost and waste inherent in transmission by shafting and belting. No such consideration need affect the designing of our factories in the future. The power of the electric current can be transmitted easily, cheaply and practically without loss through two wires; the motors can be placed directly near or upon the machines to be driven.

Home Industries.—Not only will the factory buildings themselves be constructed on different lines owing to this fact, but I look forward to an increase of home industry in which the several members of a family may be employed. From a social and economical point of view, this will prove a great advantage

to many an industry and to many a community. It will, of course, receive due consideration in planning the construction of our workmen's dwellings. I look forward to the employment of electric motors in large public buildings, hotels and in private houses.

Ventilation.—I believe this is an important question for architects, and one which has not yet found a definite solution. The usefulness of the electro motor in driving fans for ventilation has been again and again demonstrated and recognised. There can be no doubt that it will be employed largely for this purpose in the future, and will therefore have a considerable influence in the construction of buildings that require proper ventilation.

Lifts, Cranes and Trams.—At present lifts are only used in large buildings, because the power required is costly or requires room, or cannot be obtained conveniently. No doubt, with such a source of power as the electric current within the reach of private houses, we may look forward to seeing lifts, cranes and other methods of mechanical conveyance introduced into smaller houses. I suppose the want of such mechanical conveyance is now influencing the construction of many a house. Why should the kitchen be near the dining-room if we can get our dishes sent into the room by merely pushing a button?

Electric cranes have done good work in docks, and are much preferred to steam cranes. I think they will be largely employed in many of the operations necessary in the construction of buildings.

Many other instances could be cited to prove the usefulness of the electric motor, and I cannot urge too strongly upon architects the desirability of studying this question, and employing the electric motor wherever possible.

I will now refer to heating by electricity. Imagine a house built without flues, without chimneys, without hot-water pipes, and yet perfectly heated, perfectly ventilated, and with perfect cooking arrangements. Such a house could be built to-day, if we call electricity to our aid. Many such houses, I doubt not, will be built within a not too distant period. Imagine the question of smoke abatement solved in this way.

Heating by electricity is no new invention, in fact every current flowing through a conductor produces heat in proportion to the resistance of such conductor, expressed by the law C^2R , or heat equals the square of the current multiplied by the resistance. The application of such heating to industrial and domestic uses on anything like a practical scale is comparatively new, scarcely two years old. It is the natural

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outcome of the fact that we can procure in our houses a practically unlimited supply of current.

In a few words, and with some experiments, I will endeavour to explain to you the method which I have adopted in the manufacture of electrical heating apparatus; but first I would remark that in the production of electric light, whether arc or incandescent, we have an instance of the generation or development of heat of high degree in the passing of a current through a resistance; indeed, the heat produced in the arc is the most intense that can be obtained by the ingenuity of man. The resistance used in an incandescent lamp is a carbon wire, or, as it is usually termed, a filament. If made incandescent in the presence of oxygen, it would burn up; therefore we place it inside a glass globe, which is then exhausted of air. Here I have a number of such carbon filaments, all of same resistance. I will conduct the current through some without the protecting exhausted globe, some in globes partially exhausted, and some in globes completely exhausted of air. This will demonstrate to you the value of a vacuum in an incandescent electric lamp. For heating by electricity we employ metallic resistances, such as platinum, iron, or alloys. Carbon has not been practically used much, although I believe we shall in time use it for improvements. Just as in the electric lamp, so we have in this case to take precautions against the undue burning up of the resistances, and this we do by embedding them in a substance which is a non-conductor of electricity, which also protects it from oxidation, and at the same time will, by its close proximity to the surface to be heated, conduct away readily the heat produced in the wire resistance. This substance is either refractory cement or vitreous enamel. I will demonstrate to you the effect of embedding wires in this manner.

To heat the atmosphere in our room we make radiators or stoves; we can heat either by radiation or convection.

Here is such a radiator; the heat produced in the wire resistance embedded in the cement is transmitted to an iron surface having many projections and blackened. It requires a current of 10 amperes at 100 volts to warm a room of about 3,000 cubic feet. This method of heating the atmosphere by electricity is still too young to predict the success of its ultimate employment in preference to heating by coal or gas.

What I wish to demonstrate is that it can be done, and that such heating would present certain qualities (whether advantageous or not I will not judge) which are not possessed by the present methods at our disposal, and which are mainly:—There is no combustion; consequently there is no air required and

no oxygen consumed. There is no flue wanted. The apparatus can be placed in many positions impossible with the old arrangements. The heat can be subdivided and more easily directed and concentrated upon the space to be heated. It is perfectly clean. It is always ready, and requires no manual labour for starting.

Cooking.—The application of electricity to our cooking operations will no doubt effect quite a revolution in our households, and will influence the planning of our buildings accordingly.

We now make all apparatus and utensils usually employed for cooking. Technically they are made in the manner I have already explained. Ovens are fitted with small radiators at the sides and top. An "electric oven" is, in contrast to the blackness of coal and gas ovens, made of bright brass or tinned iron; as bright as possible inside to procure reflection of heat and bright and highly polished outside to prevent radiation.

Here are kettles, saucepans, grillers, toasters, fish kettles, &c. These have the resistance wires embedded in cement underneath on the outer surface of their bottom plates, and are thus brought into close proximity to the liquid or material to be heated, so that the heat is at once transmitted thereto, and by having such articles as kettles and pans polished extremely little loss occurs through radiation. All the usual necessary operations of cooking can be performed by electricity, and I have it on the authority of experts, including City aldermen, that the quality and perfection of electrically cooked viands is indisputable, and that the method is far superior to our present old-fashioned ones.

The employment of electrical heating for other purposes in our houses has not been neglected. Ladies can have their electric hair curlers, gentlemen their electric shaving pots. A great future lies open to electrical heating in industrial applications. We make many irons for laundries, tailors, as well as for domestic use, and they are much appreciated as offering great advantages.

Another interesting application I may instance is that of electrically heated branders, for packing cases, bacon, and branders for bookbinding. In electric welding we have an instance of the intense heat generated or produced by the passage of a large current through the resistance of the metals being welded at their points of contact, and it shows how readily the parts necessary to be heated can be operated upon when done electrically.

In short, I may affirm that there is not a single operation performed in our daily life by coal or gas that cannot also be



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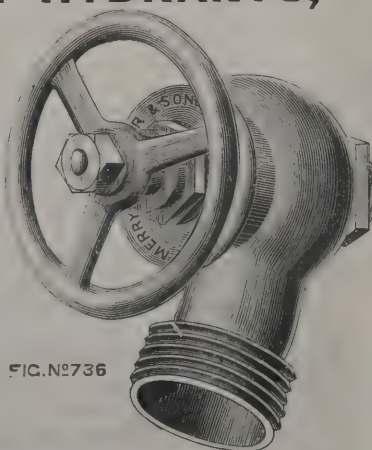


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performed by electricity, and that mostly in a superior and more advantageous manner.

Electric Lighting.—I do not propose dilating upon the advantages of the electric light, its beauty, safety from fire, non-consumption of oxygen, its decorative uses, &c. All these have been dwelt upon so often. But may I seize the opportunity I now have of talking to architects to say a few words upon a subject in connection with electric lighting, a subject which, to my knowledge, has so far received but little ventilation before architects, to whom it must mean a good deal?

This subject is, the wiring for the electric light.

The method adopted in this and many other countries is to run two wires in wood casing, having two grooves in it.

This method is a compromise between the electrical engineer and the fire-insurance inspector; the third party who ought to have a voice in the matter has never been consulted—I mean the architect.

I have heard many architects complain that this method is one which does not commend itself to them; it is difficult and sometimes impossible to provide for it in new houses, and often disfigures the walls of existing buildings to be installed with electric wires. By some it is looked upon as a necessary evil. I may affirm that this need not be so. We are not married to this system. I feel confident that a departure from present arrangements could be effected which would be appreciated both by the builder and the architect. I feel sure that the co-operation of the architect and electrical engineer will eventually produce such a modification as is felt to be desirable and even necessary by the electrical profession itself.

This brings me to say a few words about the education in matters electrical of an architect. Doubtless many a one is giving the subject his earnest consideration, but I think all architects should acquaint themselves with the elements of applied electricity. Every architect to my mind should have a fair conception of the meaning of such terms as "Volt," "Ampère," "Ohm" and "Watt." He ought to be familiar with the law known as Ohm's, which teaches us that the current flowing in a circuit is equal to the electro-motive force divided by the resistance; that the resistance multiplied by the current equals the E.M.F. Again, that the E.M.F. divided by the current equals the resistance. Again, he ought to know Joule's law—that the heat or work done in an electrical circuit is as the square of the current multiplied by the resistance, or is as the E.M.F. multiplied by the current. He ought to be familiar with the properties of wires, their

carrying capacities, their resistances, and of materials used for insulating those wires necessary to fit them for use in electrical installations. A knowledge of these and similar subjects would be of considerable service to him in preparing his plans for our modern buildings, which will be all the better for being supplied with all the comforts and luxuries capable of being bestowed upon us by making electricity our servant.

Cost.—I have so far in these notes refrained from referring to what would be the cost of employing the electric current for the purposes I have been speaking of. Doubtless, you will say, here lies the crux of the whole question. There can be no doubt that the operations can be performed, but they would be of little practical value if their cost should be beyond your clients' means. My reply to this is that the cost is not excessive or beyond the means of the moderately rich, even at the price at which the current is being generally sold, but there are indications and grounds sufficient at hand that may lead us to expect that one day electricity will also supply energy for light, power and heat to the poor.

The present ruling price is capable of being reduced to a great extent, and the very fact of its being used for motive power and heating will necessarily bring down such price.

At present the average charge for current is 6d. per unit for lighting and 3d. per unit for other uses during the day. Mr. Crompton in a paper on the cost of electricity gives the actual works cost of current, that is for coal and wages, at ½d. per unit. The rest of the cost, such as maintenance, interest on capital and management, is in a measure governed by the load factor or the proportion to daily load compared with the capacity of the plant, and if this is large and well-distributed, as it will be if heating, cooking and motive power come to be used, the percentage of such extra cost to be charged in each unit will be small, and we may look forward to seeing electricity sold in our houses at or near 2d. per unit—a price at which electricity will be able to compete with coal or gas for light as well as for power and heat, and be in many instances cheaper.

We may with confidence look forward to being able to obtain, at a not too distant period, cheap electric energy, concurrently with perfect and economical apparatus for employing it for lighting, power and heating. In view of this, architects will do well to contribute to the early and general adoption of electricity for such purposes, and thorough co-operation of architects and electrical engineers will, I feel confident, be of great value and conducive to the furtherance of the objects which this Congress of Public Health has at heart.

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QUARRYING METHODS OF THE ANCIENTS.

(Concluded from last week.)

IN sinking shafts in rock the work of the ancient Egyptians is quite equal to that of any succeeding race. Perhaps the most remarkable shaft known is that of Joseph's Well at Cairo. The upper portion of this remarkable work is rectangular in cross-section, measuring 14 feet by 18 feet, and is excavated of these dimensions through solid rock to the depth of 165 feet, at which level it is enlarged into a capacious chamber, in the floor of which is formed a tank to receive the water elevated from below. On one side of this tank, which is immediately at the bottom of the upper shaft, another shaft, 15 feet by 9 feet, but not in a line with the first, is sunk 130 feet lower, where the rock ceases, and a stratum of gravel is found which furnishes the supply of water, which is raised into the tank at the bottom of the upper shaft by machinery propelled by horses or oxen working within the chamber. These animals reach this chamber by descending a series of inclined drifts which pass around the upper shaft in a manner similar to what is known as a "spiral stair." These drifts are separated from the interior of the shaft by a wall of rock not more than 7 inches thick, and segmental apertures are cut through it to light the drifts from the shaft. The lower shaft is also provided with an inclined path cut out of its sides and descending to the water, but there is no partition between it and the well.

There has been a great deal of speculation relative to the means by which the Egyptian engineers carried the first shaft down, preserved the angle of the descending drifts and maintained the uniform thickness of the thin partition separating the drifts from the shaft. Without doubt the shaft was carried downward by hand tools somewhat in advance of the drifts, and as it progressed the line of inclination of the floor and roof of the drifts was laid out on its sides, and the segmental light openings pierced; through these it was easy to remove the material from the drifts, and to transfer the angle of the top and bottom of the drift from the lines established on the walls of the shaft. The position of the back wall of the drift could easily be accurately located parallel with the wall of the shaft by measuring through these light openings.

The tools used by the Egyptians for quarrying and stone-cutting were sometimes made of bronze and sometimes of iron. Herodotus states positively that iron tools were used in the work on the Great Pyramid, which is probably the oldest structure erected by man now remaining. In his explorations of

this pyramid Colonel Howard Vyse found a thin plate of iron embedded in the mortar between two of the courses of stones, where it had undoubtedly been placed more than five thousand years ago. Among the ruins of Naucratis (600 B.C.) there were found a few years since, in what appeared to be the remains of a manufactory of iron implements, twenty-eight iron or steel chisels evidently designed for cutting stone or iron.

It is a singular fact that none of the very few bronze tools that have been discovered are now sufficiently hard to be used for dressing stone, and it is not at all probable that such tools were used except for the softest materials. The reason why so few steel and iron tools have been discovered is doubtless to be found in the perishable character of these metals, for unless tools made of them were placed in a position free from air and moisture the sharp and hungry tooth of oxygen would rapidly gnaw them to destruction.

In addition to tools of iron, steel and bronze, the early Egyptian workers in stone without doubt employed tools similar to the "diamond drills," and "diamond saws" of our day. Mr. W. M. Flinders Petrie's work descriptive of "The Pyramids and Temples of Gizeh" exhibits some of the evidence he has discovered of the use of diamond drills and saws. It is not certain that the diamond was the jewel used to arm these implements, but it is certain that the Egyptians were acquainted with a cutting jewel far harder than quartz, and that some such jewel was used as a sharp-pointed grooving tool is placed beyond doubt by the fragments of diorite bowls with inscriptions of the fourth dynasty which were found by Mr. Petrie at Gizeh. "These inscriptions were not scraped or ground out, but were ploughed through the diorite. As the lines are only $\frac{1}{150}$ inch wide (the figures are about $\frac{2}{10}$ inch long) it is evident that the cutting-point must have been much harder than quartz and tough enough not to splinter when so fine an edge was being employed—probably only $\frac{1}{300}$ inch wide. Parallel lines are grooved only $\frac{1}{30}$ inch apart from centre to centre."

That the blades of the saws were of bronze is proved by "the green staining on the sides of the saw-cuts and on grains of sand left in the saw-cut." The forms of the tools in which jewel cutting-points were employed "were straight saws, circular saws, tubular drills and turning-tools for lathes." "The straight saws varied from $\frac{3}{100}$ to $\frac{2}{10}$ inch thick." "The largest were 8 feet or more in length." The tubular drill-holes vary from $\frac{1}{4}$ inch to 5 inches in diameter and from $\frac{1}{5}$ to $\frac{1}{2}$ inch thick. The smallest hole yet found in granite is 2 inches

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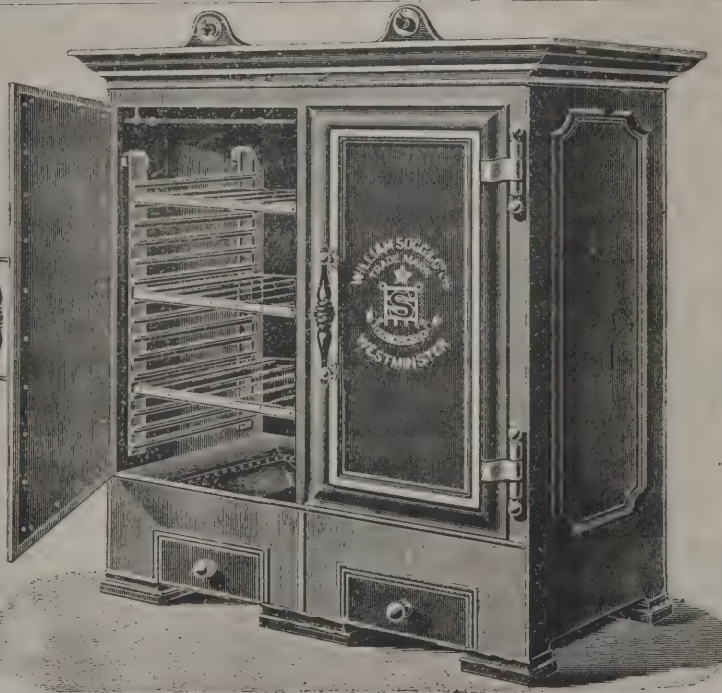
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n diameter, all the lesser holes being in limestone or alabaster, which were probably worked merely with tubes and sand.*

The lathe appears to have been well known in the fourth dynasty (about 3600 B.C.). Diorite bowls and vases of the old kingdom are frequently met with and show great technical skill.

For dressing stone the "points," "chisels" and "mallets" used were quite similar in shape to those employed at the present time. After working "chisel-drafts" around the sides of the area to be dressed the workman applied two "parallel-blocks" to the surface of the "chisel-draft" and stretched a string across the stone from the top of one "parallel-block" to the other, and then by applying another "parallel-block" to the surface of the stone in contact with one side of the string it was easy to note the depth to be removed. This method was employed only on vertical surfaces, to avoid the error arising from the "sag" of the string if used on a horizontal side of a stone. In case a less degree of accuracy was satisfactory the string was simply stretched by the hand.

"Sometimes saws were used instead of 'chisel-drafts' to lay out the work; grooves were cut about half an inch deep around a block and the hammer-dresser trimmed it down to the plane of the grooves. Often in the case of sawn blocks the surfaces to be placed in contact were roughly hammer-dressed to leave sufficient space for the cement; while just around the edges of the surface they were left quite smooth. Hence the stones would be in contact and the joints quite microscopical on the outside, while there was a fair thickness of cement on the extremely roughened surfaces inside the joint. The average thickness of the visible joints of the casing stones of the Great

Pyramid was $\frac{1}{50}$ inch in 6 feet in length. The levelling of the stones was very exact, $\frac{1}{50}$ inch variation in 100 square feet area, and a like amount in 40 feet length of joint, was the largest noted. Surface plates were used, smeared with red ochre paint, and when the stones were too large for the plates diagonal drafts or saw-cuts were run." "On the sides of the forty-three granite beams (averaging 50 tons weight each which roof the King's Chamber, and the spaces above that [in the Great Pyramid], the workmen's lines may be seen in red about half an inch wide. There are usually a line some definite distance from the dressed face, from which dressing was gauged; a mid-line at half the length of the beam; a line near each end showing where it should be placed upon the supporting walls; a line one cubit from each end, by which the lines of support could be measured off in case they were defaced; small lines in black about $\frac{1}{10}$ inch wide marked on the red in some parts to give more definite points of reference." "In lining a rock tomb with fine stone each course was not gauged to a uniform height before it was built in, but after laying it a red line at the level of the lowest stone was run round the course to mark where the dressing-down was to be done."

In India a peculiar hammer and chisel seem to have been used, the hammer being quite different from the wooden mallet employed by the ancient Egyptians. Mr. Alexander Kennedy states* that "the only tools which they [the Indian stone-dressers] employ are a small steel chisel and an iron mallet. The chisel is short, probably not longer than twice the breadth of the small hands which work it. The chisel tapers to a round point like that of a drawing pencil, and this I believe to be the only shape given to the points of their chisels. The mallet I have seen is of iron. It is somewhat longer than the chisel; its weight cannot exceed a few pounds. The head, set on at right angles to the handle, may be from two to three inches long. It has only one striking face. The striking face is formed into a deep hollow, which is lined with lead. Having with these two instruments only brought the stone to a smooth surface, it next undergoes the dressing with water in the usual manner with masons. It now only remains to apply the black shining polish, which is done as follows:—A block of granite of considerable size is rudely fashioned into

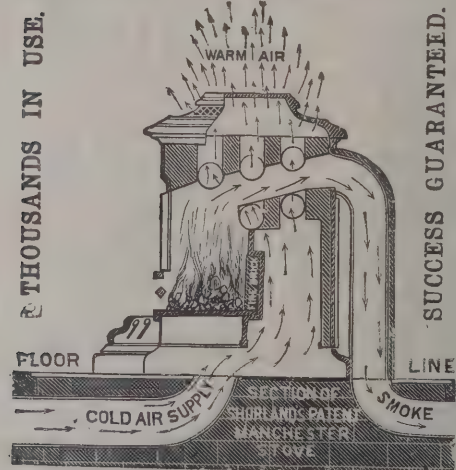
* In the early part of this century an English patent was granted to James Murdoch (the inventor of the slide-valve and chief assistant to James Watt) for a method of manufacturing water-pipes of stone. The stone of which the pipes were made was bored by means of a thin hollow cylinder of soft iron to which an alternate rotary motion was given, its lower end being copiously supplied with sand and water. In the years 1810–14 the Manchester and Salford Water Company laid water-pipes of limestone (bored by Murdoch's method) in the streets of Manchester. The bore of these pipes varied from 3 to 18 inches and they were made in lengths of about 2 feet. The prices paid for the various sizes were as follows:—

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4 " " 7s. 8d. " "	12 " " 30s. 9d. " "
6 " " 11s. 6d. " "	15 " " 35s. " "
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8 " " 16s. " "	

* Paper read before the Royal Society of Edinburgh, February 14, 1821.

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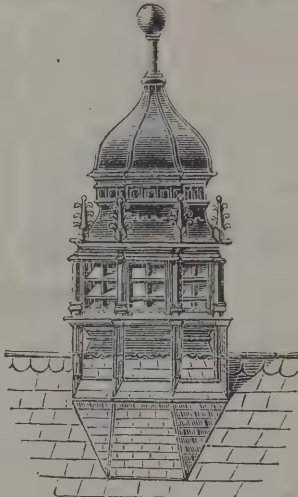
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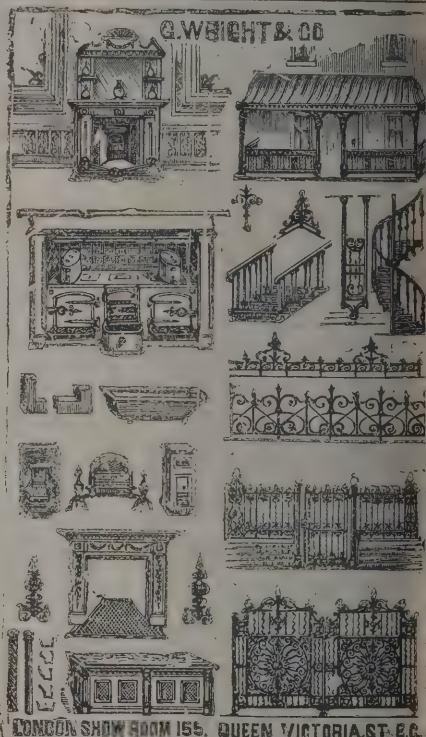
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the shape of the end of a large pestle, the lower face is hollowed out into a cavity, and this is filled with a mass composed of powdered corundum stone mixed with beeswax. This block is moved by means of two sticks, or pieces of bamboo placed on each side of its neck, and bound together by cords twisted and tightened by sticks. The weight of the whole is as much as two workmen can easily manage. They seat themselves upon or close to the stone they are to polish, and by moving the block backwards and forwards between them the polish is given by the friction of the mass of wax and corundum."

Relative to the means taken by the native workmen to ensure the horizontality of the bottom of the socket in the flinth of the Seringapatam obelisk, Colonel Wilkes says:—"I was satisfied with the means taken for insuring a true horizontal surface for the base of the shaft, but its stability entirely depended on equal accuracy in the surface of its receptacle, and seeing no mode by which, with their rude instruments, this object was to be attained, I so far departed from my first intention as to offer them a spirit-level and instructions for its use. They quickly understood and admired the contrivance, but were afraid of venturing on new methods; their own was (as they affirmed) more slow but equally certain, and they invited me to inspect it. The surface was rubbed lean and dry, and some water was dropped on it. The water ran. You see," said the engineer, "the high and the low." He dried up the water and applied the chisel to the higher portion of the surface, and by the patience and perseverance of several days the surface was perfectly polished and a drop of water remained stationary wherever it was placed. The whole obelisk received a very fair degree of polish from corundum. A piece of plank spread with a sort of cement used for setting sword-blades in their handles; whilst this substance is still liquid it is mixed and powdered over with pulverised corundum (reduced to a coarse or fine sand according to the purpose for which it is intended), and then left to dry in the sun. These planks weighted over are then used like the slabs of the stone-polisher in England."

Much more of interest might be said, but the boundaries of our limited space have already been passed, and I am admonished to forbear, and as I relinquish my pen I am reminded that with all their technical skill the ancient delvers never—so far as we are at present advised—attempted to quarry a magazine article out of history, and have it fill with precision the allotted space.

INCANDESCENT GAS-LIGHTING.

At the annual meeting of the North British Association of Gas Managers, in Glasgow, Mr. R. S. Galloway, Edinburgh, read a paper on incandescent gas-lighting, the introduction of which was due to Dr. Carl Auer von Welsbach. With the discovery of gas-lighting, he said, had entered upon a new epoch. The ordinary manner of burning gas was most wasteful and inefficient, and many patents had been taken out to utilise a gas flame as a heating instead of a lighting medium. But none had been successful till Dr. Auer von Welsbach took up the subject. The point of excellence in his invention was that immediately the gas was lighted the light-giving body or mantle was raised to its highest incandescence, and this without any forced pressure or alteration of existing fittings. All other systems which had been tried (and soon abandoned) had necessitated either artificial pressure or else the incandescence had not been attained for some considerable time. It must be understood that the Welsbach light did not owe its origin to the competition of electric light, but to accidental discoveries in the course of purely scientific studies. The advantages of this invention will be at once apparent by the following figures, and in placing these before them he must inform them he was dealing with Scotch gas or, to be more particular, gas made from Scotch coal. By tests made on the photometer, it was found that a No. 7 Bray burner gave 5 candle-power per cubic foot of gas used, while an incandescent "C" burner gave from 18 to 20 candle-power. Moreover, a No. 7 Bray burned 5 cubic feet per hour against 2½ cubic feet for an incandescent and 6 cubic feet for an Argand. That was, an incandescent burner, burning 50 per cent. less gas, gave three times more light. Then as to its advantages over electricity. An ordinary incandescent electric lamp gave 16 candle-power nominally; therefore more than three electric lamps would be required to give equal results to one incandescent "C" burner (gas). Taking 2,000 hours as the average burning time in a year—i.e. as nearly as possible five hours per day all the year round—the cost of electric current at 8d. per Board of Trade unit would amount to over 11l.; whereas the cost of the "C" incandescent gas-burner consuming 2½ cubic feet of gas per hour would be, with gas at 2s. 8d. per 1,000 cubic feet, 13s. 4d. To put this in another form:—For a given sum of money an ordinary 5 feet per hour gas-jet would give three times the light, and an incandescent gas-burner would give over twelve

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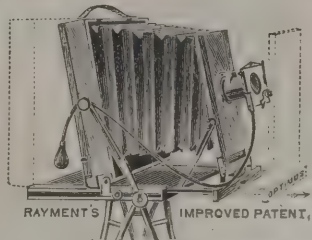
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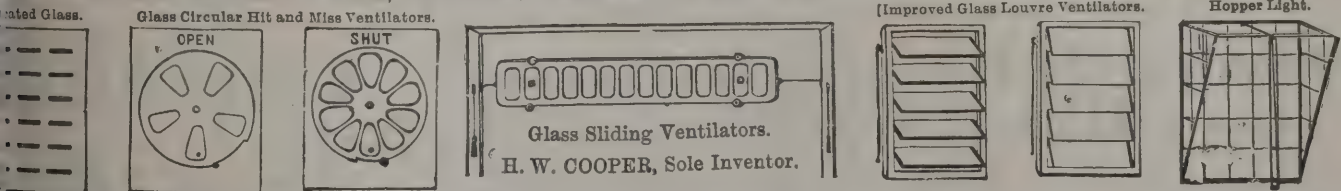
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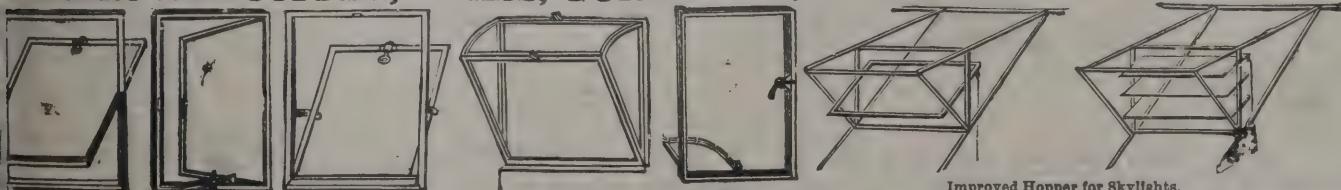


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times the light of an incandescent electric lamp. Moreover, it must be distinctly understood that when more than 2½ feet of gas was passed through an incandescent burner complete combustion seldom took place, and consequently the light was diminished. The same applied to too rich gas—that was to say, as good a light could be got from 15 or 18-candle gas as from 25-candle gas. This to gas companies where incandescent lighting was adopted would help to recompense them for a reduction in their sale of gas. He claimed that the light was practically one-eighth the cost of electric light; that it was from one-tenth to one-fifth the cost of other systems of gas-lighting; that its hygienic advantages were not obtainable with any other system of gas-lighting; that it could easily and readily be attached to existing fittings; and that it was suitable for all inside and outside lighting.

KENSINGTON COURT.

THE London County Council, having failed in the long litigation against the builders of the new mansions facing Kensington Gardens, are now trying to pursue the owner. A summons against Mr. Worley was taken out for an offence under section 85 of the Metropolis Management Act, and the case was heard before Mr. Curtis Bennett, by whom it was dismissed. An appeal was brought in the Queen's Bench Division on the 2nd inst. Mr. Poland, Q.C., for the Council, said the respondent was summoned by the London County Council for that he, on December 31, 1893, and on succeeding days up to and including March 7, 1894, at Kensington Court, committed an offence under section 85 of the Metropolis Management Act, 1862, by unlawfully erecting a building of a height beyond that permitted by the statute without the consent in writing of the London County Council, and for suffering the building to continue to be erected above the said height. At the hearing of the summons it was proved or admitted that the building in question had been erected for the respondent, and that it had been carried above the height specified in the section under his directions, and after notice from the London County Council that proceedings would be taken. The County Council, in the first place, proceeded against the builders, but the magistrate dismissed the summons. There was an appeal to the Queen's Bench Division, and the magistrate was directed to convict. The County Council afterwards desired to recover continuing

penalties of 40s. a day, but they could not proceed against the builders as they had finished the work and left the premises and therefore they had taken these proceedings against the owner. It was contended for the respondent that he was not liable to pay any penalty for the continuing offence as he had not been summoned for or convicted of the original offence and that he could not be convicted of the original offence because proceedings were not taken against him within six months of the commission or the discovery of such offence. Mr. Dickens replied for the respondent. Mr. Justice Mathew said he had no doubt that the respondent was liable to pay continuing penalties. The only limitation in the statute was that the local authority could not recover penalties for offences committed more than six months before the proceedings were instituted. The case would be remitted to the magistrate to be dealt with.

Mr. Justice Kennedy said he concurred in the judgment of his learned brother, but not without some hesitation.

THE DRAINAGE OF MANCHESTER.

A PAPER on the main drainage works of Manchester was read by Mr. W. T. Olive, the resident engineer, at the meeting of the Institute of Mechanical Engineers in that city.

Mr. Olive said that the instructions to carry out the scheme of the new main drainage works were issued by the City Council in April 1889. In the autumn of that year the first contracts were let, and operations were commenced in the beginning of 1890. Since that time the work has been continuously in progress, and has comprised twenty-two contracts for main intercepting sewers, tanks, buildings, and machinery and filtering beds. Previously to 1885 the area of Manchester was 4,296 acres, and the population 341,414. In that year the area was increased to 5,929 acres, and in 1890 six townships were added, comprising an area of 6,861 acres, so that the total area is now 12,790 acres, and the population about 515,600. The plan now being proceeded with is an intercepting scheme, whereby as far as practicable the new main sewers are carried along the valleys at such depths as to intercept the existing sewers and convey all the sewers to one main outfall, which forwards it to the sewage works at Davyhulme, five miles distant from the city. A gravitation system has been aimed at and attained, although in some places at the expense of very

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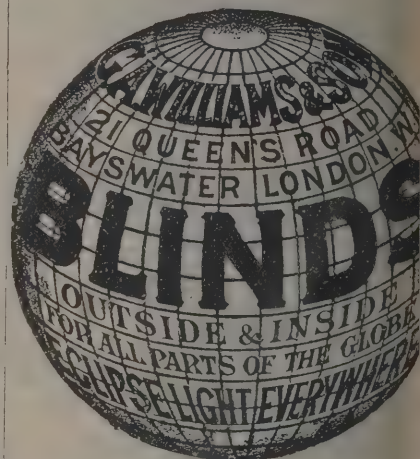
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at gradients. Nevertheless, it is believed that the sewers will be perfectly self-cleansing. The calculations for the sizes of the sewers have been based upon a present daily water-supply of 20 allons per head, together with five gallons as a margin for increase and for subsoil water; in all 25 gallons per head for a respective population of 625,000, together with a rainfall varying in different parts of the district from 3-16th inch up to 1 inch in twenty-four hours. The storm-overflow sewer discharging into the Ship Canal at Mode Wheel is so constructed that nothing can flow through it until, with the addition of rainfall, the volume flowing down the main outfall sewer at its junction with the storm-overflow sewer exceeds six times the normal flow of sewage from the whole area draining into the main outfall sewer. If at any time the flow down the storm sewer should injure the water in the Ship Canal, the Corporation can be called upon to raise the level of the weir at the junction to such a height that nothing can flow into the canal until the volume flowing down the main outfall sewer exceeds eight and a half times the normal flow of sewage from the whole area. With regard to subsoil water, from gaugings taken the author has been able to ascertain that the subsoil water entering the Manchester sewers per acre of sewer surface is at the rate of only 17,300 gallons a day, or 1.92 cubic feet per minute. The main intercepting sewers vary in size from 14 feet wide by 2 feet high to 14 feet by 10½ feet. All the sewers up to 5 feet diameter have been built in two rings of brickwork, from 5 feet to 10 feet diameter in three rings, and the main outfall, which is 14 feet wide by 10½ feet high, in four rings. In the smaller sewers blue bricks have been used for the inner ring and common reds for the outer or back ring. Both hydraulic lime and cement mortar have been used, whichever was considered most suited to the nature of the ground. By far the larger portion of the work has been done in tunnel. The strata have been for the most part sandstone rock, boulder clay, sand and ballast, and a little running sand. The greatest difficulties to contend with have been presented by the old sewers, which to a large extent follow the same lines as the new, sometimes running about the same level, side by side, or crossing over, under, or through. In two instances men have been drowned owing to the bursting of these dangerous and often badly constructed old sewers; and many times have the workings been flooded thereby. Special ironwork has had to be made, and storm-overflow chambers have been built over the old sewers wherever tapped, so that only the right amount of sewage and storm-water should enter the new sewers and

the rest should flow over a weir and down the disused portion of the old sewers to the rivers. Twice have old tunnels from the rivers Irk and Medlock to adjoining mills been cut through at great expense and trouble and some danger. In one place a disused canal branch, the existence of which was not known, was tapped and the workings were flooded, the men narrowly escaping with their lives. At Erskine Street, Stretford Road, there is a large junction-chamber or bell-mouth, where the combined flow of a 7-foot and a 9-foot sewer discharges into the main outfall sewer of elliptical section, 14 feet by 10½ feet. The length of this sewer to the storm-overflow chamber is about 3,535 yards, or just over two miles, and it varies in depth from 37 feet to 45 feet below the surface of the ground. The storm-overflow chamber measures 51½ feet long by 27 feet 2 inches wide. In passing under the Bridgewater Canal the main outfall sewer had to be constructed in two cast-iron cylinders, each 8 feet 9 inches diameter, owing to lack of head-room and the stipulation that a depth of 9 feet in place of 5½ feet was to be provided. The work was done, half at a time, by means of coffer-dams made of sand, and the canal had to be temporarily widened in order to provide for an uninterrupted traffic. From the storm-overflow chamber to the tanks, a distance of 4,259 yards, or 2.42 miles, the main outfall sewer is diminished in size to 10 feet diameter with a fall of 1 in 2,000. It averages 15 feet deep, and has been laid in open cutting and through fields. With regard to outfall works, Mr. Olive said that the Corporation are under obligation to treat chemically, and also to filter subsequently through land the effluent of the dry-weather flow of sewage from the population of the city, equal at 4 cubic feet per head to a quantity of 2,400,000 cubic feet per twenty-four hours upon a total population of 600,000, or 2,500 cubic feet per minute, assuming half the total flow to pass in eight hours. The buildings are designed in a conventional style of architecture, and somewhat resemble a modern farm building. He further described the buildings in use. There are eleven settling tanks, all open to the air, each 300 feet long and 100 feet wide, having an average depth of 6 feet, a total water surface area of about 7½ acres, and a holding capacity of 12½ million gallons. The floors are of cement concrete, and all the walls of brickwork. The floors of the tanks are level transversely, and fall 1 in 150 from the overflow end to the inlet end. After the sewage leaves the 10-foot outfall sewer it flows through a screen inclined at an angle of about 60 degs. with the horizontal. Immediately behind the screen the chemicals—sulphate of

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alumina and milk of lime—are added, and thoroughly mixed with the sewage by means of an agitator. The water then passes on into the channel through the sluice ways, and is admitted into any particular tank by means of small sluices provided for that purpose, three to each tank. In sudden and heavy storms, when the amount of water is too great to be properly coped with, other sluices may be opened. The land owned by the Corporation for filtration, apart from that occupied by the tanks and buildings, is about 325 acres, namely, 112 acres at Davyhulme and 213 acres at Flixton, two miles distant. Only thirty acres are at present laid out, in two beds. The beds are drained by 18-inch mains, socketed pipes with puddle joints, laid about 200 feet apart and parallel to the centre bank; into these pipes 6-inch agricultural drain-tiles laid 30 feet apart are connected. In addition to the area of 123 acres acquired in 1888, powers have since been taken for the acquisition of a further quantity of land for filtration in the townships of Carrington and Flixton, near the junction of the Manchester Ship Canal with the river Mersey. This area contains about 213 acres. It has been selected with the view of obviating the necessity for pumping the effluent, which can be delivered by gravitation upon 180 acres; and this area, together with the portions at Davyhulme devoted to filtration, amounts in the aggregate to about 240 acres, which is estimated to suffice for a total population of 600,000, or at the rate of 2,500 persons per acre. A description of the machinery in use at the works was also given by Mr. Olive. The two pumps by which the sludge is pumped up from the sludge well into the sludge pits are fixed in the well, and are of the horizontal direct-acting kind known as the "special" steam-pump. The steam cylinders are 12 inches diameter and the sludge barrels 9 inches diameter, with a stroke of 24 inches, both double-acting; each pump is capable of raising 290 tons of sewage sludge in eight hours to a height of 32 feet, or the two conjointly 580 tons. The installation of electric lighting at the works includes a vertical engine with 13-inch cylinder and 16-inch stroke to run at 130 revolutions per minute with a pressure of 80 lbs. per square inch. There is also a set of fifty-six storage batteries capable of running with lamps of 16 candle-power a maximum of 420 lamp-hours. The number of lamps at present in use is 134—14 arcs of 1,200 candle-power for outside use, 12 arcs of 500 candle-power for inside use, 88 incandescent lamps of 16 candle-power for inside use, 8 incandescent lamps of 50 candle-power on the approach road and 12 incandescent lamps of 32 candle-power in the subway.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C. from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

14145. John French Golding, for "Improvements in the construction of floors and ceilings."
 14147. John French Golding, for "Improvements in the construction of partitions for buildings."
 14168. James William Shephard, for "An improved levelling, also angle gradient and distance measuring instrument for surveying or other purposes."
 14178. Thomas Atkins, for "Improvements in flushing cisterns."
 14251. Alfred John Ball and John de Courcy Hickton, for "Improvements in fasteners for window-sashes and the like."
 14310. Robert Waugh, for "An improved bolt or fastener for windows, doors and the like."
 14318. James Charles Haste, for "Improvements in window-fasteners."
 14342. Frederick Howard Brooke, for "Improvements in bricks for paving and the like."
 14360. Richard de Mulinfeldt Lawson, for "Improvements in doors and windows for buildings, &c."
 14510. Daniel Griffin, for "A combination hinge, lock and sash-fastener."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

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The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ARCLID.—Aug. 23.—For Extensions to Tramp Wards at the Workhouse. Mr. James Brown, Albert Street, Congleton.

BLACKBURN.—Aug. 31.—For Building St. Silas Church in Preston New Road. Messrs. Paley, Austin & Paley, Architects, Lancaster.

BLAGDON.—Aug. 28.—For Alterations and Additions to Schools. Mr. F. W. Wills, Architect, Foster's Chambers, Small Street, Bristol.

BOLTON.—Sept. 3.—For Taking Down and Rebuilding Steel Girder Bridge. Borough Surveyor, Town Hall, Bolton.

BOW, DEVON.—Aug. 23.—For Erection of Farm Buildings, Coach-house, Loose-boxes, &c. Mr. R. Staddon, Architect, Dulverton.

BRIDGEND.—Aug. 21.—For Building Cottage Hospital. Messrs. Lambert & Rees, Architects, Bridgend.

BURTON-ON-TRENT.—Aug. 31.—For Alterations to Wins-hill Girls' School, and Erection of Infants' School. Mr. Reginald Churchill, St. Paul's Square, Burton-on-Trent.

BURY.—Aug. 20.—For Construction of Brick Sewers. Mr. J. Cartwright, Borough Engineer.

CHILTON FOLIAT.—Aug. 22.—For Building Reading and Entertainment Room. Mr. J. H. Money, Architect, The Broadway, Newbury.

CHRISTCHURCH.—Aug. 25.—For Adding Block to Men's Quarters at the Workhouse. Mr. E. H. Burton, Architect, Bournemouth.

CHRISTCHURCH.—Aug. 25.—For Building Cottage Homes and Schools. Mr. A. Druitt, Clerk to the Board of Guardians. Mr. E. H. Burton, Architect, Bournemouth.

CRUMLIN.—Sept. 1.—For Building Twelve Houses. Mr. W. L. Griffiths, Architect, 27 High Street, Newport, Mon.

CUDWORTH.—Aug. 17.—For Alterations and Additions to Schools. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

DOWNPATRICK.—Aug. 20.—For Additions and Supplying Heating Apparatus to Church. Mr. J. W. Bassett, Architect, Downpatrick.

ECCLES.—Sept. 5.—For Constructing Pipe Sewers. Mr. A. C. Turley, Town Hall, Eccles.

FARNHAM.—Aug. 21.—For Additions and Alterations to Hale Mixed Schools. Mr. J. Alfred Foggar, West Street, Farnham.

GREAT ECCLESTON.—Aug. 18.—For Fitting-up Ground for Agricultural Society's Show. Mr. R. Hutchinson, Agricultural Society, Great Eccleston, Garstang, Lancs.

GLASGOW.—Aug. 20.—For Building Pumping Station. Messrs. J. Burnet, Son & Campbell, Architects, 167 St. Vincent Street, Glasgow.

HALIFAX.—Aug. 22.—For Building Wheat Sheaf Inn. Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

HANWELL.—Aug. 18.—For Painting School. Mr. A. G. Langdon, 17 Craven Street, London, W.C.

HARROGATE.—Sept. 7.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

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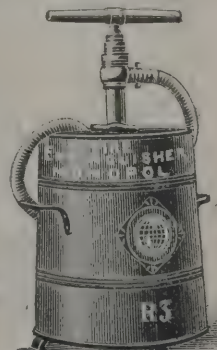
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HELLINGLY.—Aug. 27.—For Building Chapel. Mr. G. Wheen, Game Lands, Hellingly, Sussex.

HEWELSFIELD.—Aug. 25.—For Building School. Mr. Northcroft, 57 Charing Cross, London, S.W.

HORWICH.—Aug. 28.—For Sewering, Levelling, Paving, &c. Mr. J. E. Jackson, Public Hall, Horwich.

ILLINGWORTH.—Aug. 25.—For Pulling Down and Rebuilding Two Shops and House. Mr. M. Hall, Architect, 29 Northgate, Halifax.

LISBURN.—Sept. 6.—For Construction of Extensive Works for the Water Supply. Mr. John Lanyon, Engineer, Northern Bank Chambers, Belfast. Mr. Richard Young, Lisburn, Town Clerk.

LITTLE LEVER.—Aug. 23.—For Sewage Works. Messrs. Lomax & Lomax, 11 Fold Street, Bolton.

LIVERPOOL.—Sept. 18.—For Erection of Superstructure of proposed Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LUDLOW.—Aug. 29.—For Constructing Stoneware Pipe, Sewers, &c. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

MANCHESTER.—Aug. 18.—For Supply of Pumping Engines for Hydraulic Power Supply. The Town Clerk.

MEVACISSEY.—Sept. 3.—For Building Lifeboat House. Engineer, National Lifeboat Institution, 17 Victoria Street, Westminster, S.W.

MITCHELSTOWN.—Aug. 23.—For Building Dwelling-house, Out-buildings, &c. Mr. R. Fitzgibbon, Clerk to the Guardians, Mitchelstown.

NEWCASTLE-ON-TYNE.—For Building Parish Hall. Messrs. Crawford, Hick & Wilkinson, 3 Arcade, Newcastle-on-Tyne.

NEWTON TOWNEY.—Aug. 17.—For Additions and Alterations to School. Messrs. J. Harding & Son, Architects, 51 Canal, Salisbury.

OVER WALLOP.—Aug. 18.—For Building School and Master's House. Messrs. J. Harding & Son, Architects, 51 Canal, Salisbury.

PLYMOUTH.—Aug. 27.—For Building Retaining Wall. Borough Engineer, Plymouth.

POOLE.—Aug. 29.—For Constructing Stoneware Pipe Sewers. Borough Engineer, Poole.

RUNCORN.—Aug. 28.—For Cutting and Laying Pipe Sewer. Mr. E. Marshall, Town Hall, Runcorn.

SANDBACH.—Sept. 1.—For Constructing Waterworks. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

SEDBERGH.—Aug. 25.—For Building Farmhouse. Mr. S. Shaw, Architect, Kendal.

SOUTHEND-ON-SEA.—Aug. 27.—For Laying about 250 Yards of 21-inch Pipe Sewer. Mr. C. S. Copley, Borough Surveyor, Clarence Road, Southend.

SOUTHWOLD.—Aug. 30.—For Constructing Pipe Sewers, Sewage Tanks, &c. Mr. F. Beesley, 11 Victoria Street, Westminster.

TREHARRIS.—Aug. 17.—For Additions to Board School. Mr. John Williams, Architect, Morgantown, Merthyr Tydfil.

WHITTINGHAM.—Aug. 26.—For Painting the Asylum, Whittingham, near Preston, Lancs.

WORKSOP.—Aug. 25.—For Sinking Well. Mr. J. Allsopp, Engineer, Worksop.

WORTHING.—Aug. 27.—For Building Pumping Station, Chimney Shaft, Service Reservoir, Laying Cast-iron Mains, &c. Mr. J. Mansergh, 5 Victoria Street, Westminster.

WREXHAM.—Aug. 22.—For Building Bridge and Supplying and Fixing Fencing. Borough Surveyor, Guildhall, Wrexham.

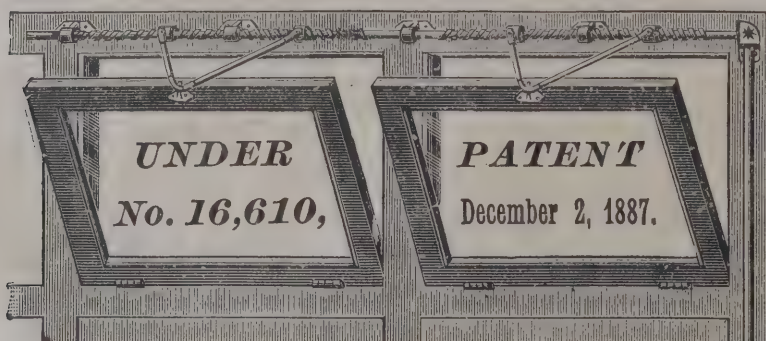
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W. Bowers & Co., Hereford	1,242	15	0
A. C. & G. Lewis, Bromyard	1,205	0	0
A. Newbold, Bromyard	1,154	1	0
H. Stokes, Worcester	1,147	0	0
J. Everal, Malvern	1,140	0	0
W. JAMES, Bromyard (accepted)	946	11	4

CARDIFF.

For Reconstruction of Guildford Crescent Baths, for the Corporation. Mr. W. HARPUR, Borough Engineer.

W. Thomas & Co.	£14,550	1	2
S. Shepton & Son	14,526	11	7
H. Gibbon	14,504	0	0
Jones Bros.	13,550	0	0
Lathey & Co.	13,450	0	0
J. Gibson	13,367	12	6
Turner & Sons	13,288	0	0
J. Thomas	12,965	0	0
H. Davies	12,641	4	4
D. Davies	12,641	0	0
J. Allan	12,411	0	0
W. SYMONDS & CO. (accepted)	12,359	19	3
Engineer's estimate	12,590	17	0

CHESHUNT.

For Kerbing, Channelling, Constructing Surface-water Drain, and Making-up Cecil and Burleigh Roads, for the Cheshunt Local Board. Mr. S. TOWLSON, Surveyor, Turner's Hill, Cheshunt.

E. J. Bretts, Enfield Highway	£540	0	0
Fry Bros., Greenwich	538	0	0
J. Dickson, St. Albans	499	10	0
Lagdon & Crawford, Old Ford	490	0	0
W. Griffiths, Kingsland Road	483	0	0
G. Bell, Tottenham	460	0	0
M. S. Kitteringham, Enfield	444	0	0
W. Lee & Son, High Wycombe	439	2	0
W. WADEV, Stoke Newington (accepted)	393	11	0
J. C. Trueman, Swanley (withdrawn)	363	0	0

CHESTERFIELD.

For Works in Chester Street and Catherine Street, West Ward, for the Highway and Improvement Committee. Mr. NICHOLAS DUNSCOMBE, Borough Surveyor.

Catherine Street.

G. Hall, Sheffield	£204	4	9
R. HOLMES & Co., Chesterfield (accepted)	193	0	0
Borough Surveyor's estimate	202	13	1

Chester Street.

G. Hall	342	6	6
R. HOLMES & Co. (accepted)	328	0	0
Borough Surveyor's estimate	349	5	11

CLECKHEATON.

For Erection of Engine-house, &c., Netherfield Mill, Cleckheaton. Messrs. JAMES YOUNG & CO., Architects, 62 Market Street, Bradford.

J. Moulson & Son, Bradford	£2,043	0	0
F. Ives, Shipley	1,930	0	0
J. Bairstow, Shipley	1,910	0	0
J. Deacon, Shipley	1,833	0	0
W. North, Idle	1,720	0	0
H. BIRKBY & SONS, Wyke, near Bradford (accepted)	1,655	0	0
K. Wilkinson & Sons, Bradford	1,633	0	0

DARTFORD.

For Iron Fencing to the Airing Grounds of the Gore Farm Hospital, Dartford, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

Bayliss, Jones & Bayliss, Cannon Street	£808	11	6
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DROGHEDA.

For Building Six Artisan Dwellings, Chord Road, Drogheda, for the Nuns of Sienna Convent. Messrs. A. SCOTT & SONS, Architects, Drogheda.

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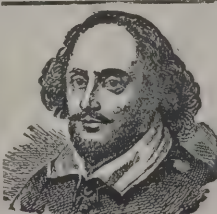
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For Alterations and Additions to Beaumont, Fay Gate, Sussex, for Mr. J. Moore. Mr. T. POTTER, Architect, 49 London Road, Sevenoaks. Quantities by Architect.

Wiltshire & Son, Sevenoaks	£3,374	0	0
Rowland Bros., Horsham	3,100	0	0
J. Longley & Co., Crawley	2,897	0	0
P. PETERS, Horsham (<i>accepted</i>)	2,873	0	0
T. Ockenden & Co., Crawley	2,871	0	0
Architect's estimate	2,888	0	0

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For Completion of the Works of the Inverness Contract on the Direct Line to Aviemore, extending from the Ticket Platform at Inverness Station to Culdoich, in Strathnairn, a distance of about 7 Miles 1,132 Yards, for the Highland Railway Company. Mr. MURDOCH PATERSON, Engineer, Inverness.

C. BRAND & SON, Glasgow (<i>accepted</i>)	£104,953	18	6
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IPSWICH.

For Alterations and Decorative Works at West Tower, for Mr. A. Wainwright Mr. JOHN S. CORDER, Architect.

CRISP & SMITH (<i>accepted</i>)	£329	18	6
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For Repairs at Oak Lane Rooms, for the Trustees. Mr. JOHN S. CORDER, Architect.

CRISP & SMITH (<i>accepted</i>)	£93	16	0
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LOUGHBOROUGH.

For Extension of Effluent and Storm Outfall to River Soar, River Retaining Wall, Land Drainage, Main and Subsidiary Carriers and Preparation of 18 Acres of Land for Filtration Area, for the Town Council. Mr. A. W. CROSS, Borough Engineer

G. Lawson, Edinburgh	£2,484	11	0
T. Philbrick, Leicester	1,845	16	0
J. Mason, Belgrave, Leicester	1,763	9	6
G. Bell, Tottenham	1,575	0	0
W. MOSS & SON, Loughborough (<i>accepted</i>)	1,550	2	6
Engineer's estimate	1,574	14	0

KINGSTHORPE.

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J. H. Vickers, Nottingham	£8,634	9	10
Band, Grays, Essex	7,530	0	0
G. G. Rayner, Liverpool	7,455	0	0
Green Bros., Northampton	6,830	0	0
Siddons & Freeman, Oundle	6,370	0	0
Weldon, Birmingham	6,028	0	0
S. Woods, Northampton	5,972	10	2
Branson & Son, Northampton	5,876	10	0
Lee, Northampton	5,724	0	0
Gregory, Northampton	5,617	0	0
Cosford, Northampton	5,366	6	0
Martin, Northampton	5,276	0	0
FINNEGAN, Northampton (<i>accepted</i>)	5,233	3	5

LINCOLN.

For Additions to the Co-operative Stores in Montagu Street. Mr. F. SMITH, Architect, Manchester.

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A. Wright	2,929	0	0
H. S. & W. Close	2,621	0	0
Lansdown & Son	2,580	0	0
WRIGHT & SON (<i>accepted</i>)	2,236	0	0

LONDON.

For Erection of Northern Polytechnic Institute, Islington. Mr. CHARLES BELL, F.R.I.B.A., Architect. Quantities by Mr. C. G. ROBERTS.

	Section 1.	Section 2.	Section 3.	Total.
Woodward & Co.	£9,399	£18,405	£6,808	£34,612
Dove Bros.	8,885	17,845	6,425	33,155
W. & H. Castle	8,580	17,537	6,240	32,357
Lown & Sons	8,512	17,406	6,264	32,182
C. Dearing & Son	8,320	17,000	6,050	31,370
Chas. Wall	8,300	17,000	5,900	31,200
Mattock Bros.	8,177	16,921	6,033	31,131
Lawrance & Sons	8,193	16,710	5,977	30,880
G. S. Williams & Son	7,800	16,743	6,100	30,643
Howell J. Williams	8,127	16,180	5,980	30,287
Wm. Goodman	8,000	16,410	5,823	30,233
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1829.

LONDON—continued.

For New Sanitary Fittings and other Alterations to the George Yard Schools, for the Trustees. Messrs. WIGG, OLIVER & HUDSON, Architects, 80 Leman Street, E., and 7 Bedford Row, W.C. Quantities by Mr. F. G. W. BUSS.

Thomas Little	£949	0	0
A. Eaton & Co.	775	0	0
J. & H. Cocks	710	0	0
J. Outhwaite & Son	698	0	0
W. GLADDING, Whitechapel (accepted)	643	0	0

For New Buildings, Frazier Street, Lambeth, for Mr. John Paterson. Mr. J. W. YOUNG, Architect, 8 Bolton Road, St. John's Wood.

Young & Lonsdale	2,256	0	0
Appleyby	1,709	0	0

For Erecting a Boundary Fence Wall at the North-Eastern Hospital, St. Ann's Road, Tottenham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, 15 Leadenhall Street.

A. T. Hawkins	£249	10	0
Coates	235	12	6
Wall & Co.	183	0	0
Yates & Co.	150	9	0
Hart	148	7	6
Johnson & Co.	148	0	0
Williamson & Sons	144	0	0
WILLMOTT & SONS, Hornsey (accepted)	122	0	0

For Fitting-up Hot Water Supply and Warming Apparatus to Three New Blocks at the Eastern Hospital, The Grove, Homerton, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street.

C. Kite & Co.	£1,400	0	0
J. Fraser & Sons	1,243	0	0
Strode & Co.	1,133	0	0
J. & F. May	1,125	0	0
Potter & Sons	1,113	0	0
J. & C. Christie	1,111	0	0
Sugg & Co.	1,081	0	0
Benham & Son	1,080	0	0
Vaughan & Brown	1,050	0	0
Murdock & Cameron	995	0	0
J. C. & J. S. Ellis	995	0	0
CLARKE & SONS, 43 Moorgate Street (accepted)	970	0	0

LONDON—continued.

For Paving the Carriageway of St. Paul's Road with Wood, for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.

McCormack & Son, Canonbury	£3,477	4	2
E. Parry, Walham Green	3,121	0	10
W. Wadey, Stoke Newington	3,006	2	11
W. Wadey, Stoke Newington	2,880	2	11
W. Griffiths, Kingsland	2,862	0	0
J. Mowlem & Co., Westminster	2,755	12	1
THE IMPROVED WOOD PAVEMENT CO., Queen Victoria Street (accepted)	2,512	18	4

For the Erection of Mission Church and Parish Room, for the Vicar and Churchwardens of St. Luke's, Victoria Docks, E. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row, W.C., and 80 Leman Street, E. Quantities by Mr. F. G. W. BUSS.

John Sparks & Son	£1,985	0	0
W. J. Maddison	1,919	0	0
Walter Gladding	1,766	0	0
J. Noakes	1,752	0	0
James Webb	1,675	0	0
J. G. Horlock	1,589	0	0

For Erection of New Hotel, Hans Place, Chelsea, London. Messrs. READ & MACDONALD, Architects, Oxford Street, W. Quantities by Mr. W. H. ELSMORE, Barnes, London.

STEPHENS, BASTOW & CO., Limited, Bristol (accepted) £38,250 0 0

For Alterations and Additions to Workhouse, Fulham Palace Road, Hammersmith, W, for the Guardians of Fulham Union. Mr. A. SAXON SNELL, F.R.I.B.A., Architect, 22 Southampton Buildings, Chancery Lane, W.C.

F. Dupont	£7,259	0	0
Foster & Dicksee	5,878	0	0
J. H. Newman	5,690	0	0
H. Wall & Co.	5,497	0	0
H. Lovatt	5,306	0	0
B. E. NIGHTINGALE, Albert Embankment, S.W. (accepted)	5,095	0	0

For an Underground Convenience in Parkhurst Road, by Hollo way Road, N., for the Vestry of St. Mary, Islington, N. Mr. J. PATTEN BARBER, Chief Surveyor.

Doulton & Co., Albert Embankment	£3,139	0	0
G. JENNINGS, Lambeth Palace Road (accepted)	2,400	0	0

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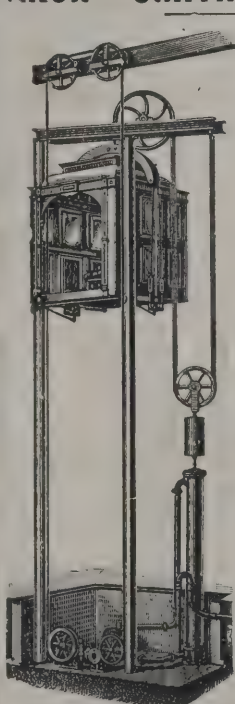
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LONDON—continued.

For an Underground Convenience in High Street, Islington, N., for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.

G. Jennings, Lambeth Palace Road	£1,550	0	0
B. Finch & Co, 82 Belvedere Road	1,480	0	0
DOULTON & CO., Albert Embankment (accepted)	1,433	0	0

For Erection of Cottage Hospital, Wood Green. Mr. CHARLES BELL, F.R.I.B.A., Architect.

Voller	£2,245	0	0
Mattock Bros.	1,979	0	0
Say	1,840	0	0
C. WALL (accepted)	1,800	0	0

LYMINGTON.

For Erection of Two External Iron Staircases at the Workhouse, to be used as Fire-escapes in case of necessity.

George & Harding, Bournemouth	£233	0	0
Jenkins & Son, Bournemouth	194	0	0
St. Pancras Ironwork Co.	192	0	0
Drew & Co.	180	0	0
Allen & Son, Glasgow	178	5	0
Bacon & Curtis, Bournemouth	158	10	0
G. F. Saul, Lymington	142	0	0
Blackwall Ironwork Co.	128	10	0

(Architect's estimate was 100% for Three Staircases, and 66% 10s. for two.)

For Work in Connection with Drainage and Water Supply at the Workhouse, for the Guardians of Lymington Union. Mr. C. T. MILES, Surveyor, Observer Chambers, Bournemouth.

J. White, Bournemouth	£575	0	0
George & Harding, Bournemouth	554	0	0
Jenkins & Son, Bournemouth	493	0	0
F. Reeks, Lymington	490	0	0
W. Hoare, Bournemouth	482	10	0
S. Saunders, Bourne Valley	482	0	0
G. Troke, Winton	462	0	0
Saunders & Co., Bournemouth	416	0	0
A. WHEELER, Lymington (accepted)	398	17	0

MASBOROUGH.

For Erection of Three Dwelling-houses, &c., Ferham Street, Masborough. Mr. J. AXLEBY, Architect, Wilton Lane, Masborough.

W. Thornton & Son, Rotherham	£764	0	0
W. Marshall, Rotherham	737	0	0
G. Saul, Masborough	681	6	0
W. Charles, Masborough	662	10	0
G. H. MAY, Masborough (accepted)	605	10	0

MULLINGAR.

For Building two Sanitary Annexes, &c., to County Infirmary, for the Governors of the Westmeath County Infirmary.

R. Mullally, Mullingar	£430	10	0
WILLIS BROS., Mullingar (accepted)	400	0	0

NEWBURY.

For Alterations and Additions to the Boys' British School. Mr. WALTER H. BELL, Architect, Newbury.

W. Church, Newbury	£168	9	0
G. Head, Burghclere	155	9	0
A. Chivers, Newbury	149	19	7
E. C. James, Newbury	148	0	0
Pope & Co., Woodhay	143	4	3
A. Houghton, Newbury	139	0	0
T. Taylor	132	10	6

NEWTOWNARDS.

For About 563 Lineal Yards of Pipe Sewers, 9 Inches and 12 Inches in Diameter, between High Street and Mill Street, Comber, including Manholes and Flushing Tank, for the Guardians. Mr. P. C. COWAN, Architect, 48 Upper Arthur Street, Belfast.

J. Graham, Dromore	£360	15	0
R. Connor, Comber	347	10	0
T. C. Rayner, Bangor	296	9	9
WORKMAN & Co., Belfast (accepted)	255	0	0

NORTHMOLTON.

For Erection of Cloak-rooms, Offices, School Premises, &c., for the Northmolton School Board.

W. Wester, Southmolton	£257	0	0
W. H. BAWDEN, Bishopsnympton (accepted)	247	0	0

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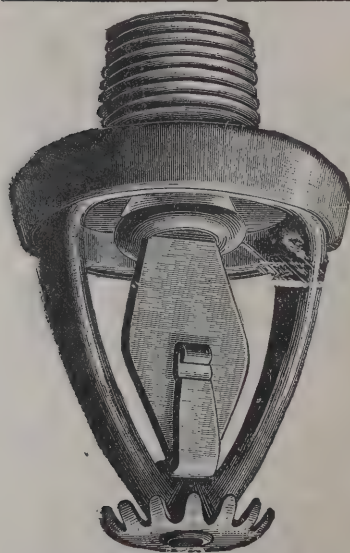
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PLYMOUTH.

For Alterations to Premises and Setting Back to Improvement Line, No. 15 Nottle Street, Plymouth. Mr. JAS. HARVEY, Architect, 9 Courtenay Street, Plymouth.

Kerswell	£265	0	0
Tozer	219	10	0
Pearn	206	10	0
Andrews	194	0	0
Foot	189	10	0
Roach & Lovell	172	15	0
BLAKE (accepted)	160	0	0

PORTSMOUTH.

For Supplying and Fixing Cast-iron Valve Seatings for the Pumps at Eastney Pumping Station, and other Works in Connection therewith, for the Town Council.

McKinlay & Co., Portsmouth	£293	10	0
J. Watt & Co., London	275	0	0
Oakes & Son, Portsmouth	219	10	0
ROBERTSON & SON, London (accepted)	210	0	0

POSTWICK.

For Erection of New Farmhouses and Farm Buildings, for the Right Hon. the Earl of Rosebery, K.G. Mr. HERBERT J. GREEN, Architect and Diocesan Surveyor, Norwich.

R. W. RICHES, Postwick (accepted).

RUGBY.

For Erection of Stabling, Russel Street, Rugby, for the Committee of the Rugby Co-operative Society. Mr. J. T. FRANKLIN, Architect, 40 Bridget Street, Rugby.

Parnell & Son	£1,229	0	0
Over	1,177	0	0
Hollowell	1,163	0	0
Young	1,143	0	0
SATCHELL (accepted)	1,073	0	0

SALISBURY.

For Building Four Cottages, Culver Street, for Mr. E. Grove. Messrs. JOHN HARDING & SON, Architects, 51 Canal, Salisbury.

Vincent & Folland	£688	0	0
Kellow & Smith	657	0	0
Wort & Way	650	0	0
C. Stevens	634	0	0
W. ROLES (accepted)	620	0	0
P. Tryhorn	596	0	0

SALISBURY—continued.

For Technical Education Buildings (Gymnasium and Workshops), Brown Street, for the Town Council. Mr. ALFRED C. BOTHAMS, Architect, Salisbury. Quantities by Architect.

Tryhorn	£1,244	16	0
Hayes	1,157	0	0
G. Harris	1,091	0	0
Dibben	1,066	10	0
Webb & Co.	1,061	0	0
Hale	1,054	0	0
Kellow & Smith	1,054	0	0
Vincent & Folland	1,020	0	0
Witt	1,008	8	5
Chinchen	989	0	0
Wort & Way	941	0	0
KITE (accepted)	939	0	0

For Technical Education Buildings (Lecture and Classrooms), New Street, for the Town Council. Mr. ALFRED C. BOTHAMS, Architect, Salisbury. Quantities by Architect.

Witt	£1,350	0	0
G. Harris	1,320	0	0
Vincent & Folland	1,290	0	0
Hayes	1,236	0	0
Chinchen	1,195	0	0
Hale	1,176	0	0
Kellow & Smith	1,167	0	0
Kite	1,164	0	0
Dibben	1,154	0	0
Webb & Co.	1,113	0	0
WORT & WAY, Salisbury (accepted)	1,082	10	0

SHILTON.

For Additions, Alterations, Painting, &c., Anstey Hall, Shilton, near Coventry, Warwickshire, for Colonel E. Woolcombe Adams. Mr. BASIL SLADE, Architect, 3 Grosvenor Street, W. Messrs. DUNK & BOUSFIELD, Surveyors, Billiter Square Buildings, London, E.C.

C. J. Hill	£2,485	10	0
Forster & Dicksee	2,400	0	0
Halliday	2,359	0	0
F. Messom	2,323	0	0
Treasure & Son	2,322	0	0
Parnell & Son	2,150	0	0

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ST. ALBANS.

For Additions to the Infirmary at the Workhouse, St. Albans, for the Guardians. Mr. T. F. WOODMAN, Surveyor, St. Albans.

Miskin & Co.	£2,885	0	0
Dunham Bros.	2,875	0	0
Whibley & Jervis	2,650	0	0
J. & W. Savage	2,599	0	0
SPARROW & CO, Harpenden (accepted)	2,595	0	0

For Additions to Mr. H. Slade's Warehouse, Victoria Street.

C. Miskin	£512	0	0
J. & W. Savage	424	0	0
WHIBLEY & JERVIS (accepted)	420	0	0

STOCKPORT.

For Supplying and Fixing about 260 Lineal Yards of Continuous Wrought-iron Railing at the St. Thomas's Recreation Ground, Hemshaw Lane, for the General Purposes Committee. Mr. JOHN ATKINSON, Borough Surveyor.

Hamnett & Son	£188	10	0
Bowden	184	1	10
Walker & Cocks	177	12	6
Hamnett	145	0	0
Yarwood	145	0	0
J. Thorniley	130	10	0
HOLLINGDRAKE & SON (accepted)	129	5	10

STRATFORD.

For Erection of New Stores and Stabling, for Messrs. Inc. Coope & Co., Limited. Messrs. WIGG, OLIVER & HUDSON, Architects, 80 Leman Street, E., and 7 Bedford Row, W. C.

	A	B	C
W. Gregar & Son	£2,537	£1,437	£1,377
W. Watson	—	1,283	1,158
WALTER GLADDING, Whitechapel (accepted)	1,187	1,187	1,187
A. To give possession in 31 days.			
B. " " "	42	"	"
C. " " "	56	"	"

TOLLESHUNT D'ARCY.

For Additions to Parish Schools, Tolleshunt D'Arcy. Mr. P. M. BEAUMONT, Architect, Maldon.

J. Gozzett, Maldon	£230	0	0
T. Wilding, Maldon	228	10	0
Smith & Son, Witham	219	0	0
A. Ward, Great Totham	188	13	0
T. STRUTT, D'Arcy (accepted)	152	10	0

TREDEGAR.

For Alterations and Additions to George Town School, Tredegar, and Victoria School, Ebbw Vale, for the Bedwelty School Board.

George Town School.

E. Morgan	£730	10	0
T. Edwards	716	0	0
S. Arrowsmith	712	0	0
R. EDWARDS (accepted)	710	0	0

Victoria School.

S. Arrowsmith	805	0	0
T. Edwards	800	0	0
E. Morgan	790	0	0
R. EDWARDS (accepted)	785	12	0

WALTHAM CROSS.

For Residence for Mr. Thos. Hamilton, on the Colvin Estate. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row, W. C., and 80 Leman Street, E.

S. J. Scott	£1,846	0	0
W. Shurmur	1,757	0	0
L. & W. H. Patman	1,723	0	0
J. Bentley	1,694	0	0
C. White	1,657	0	0
W. Gardener	1,558	10	0

WALTHAMSTOW.

For Alterations at Aveling's Farm, for the Rev. J. G. Cazenove, D.D. Messrs. WIGG, OLIVER & HUDSON, Architects, 7 Bedford Row, W. C., and 80 Leman Street, E.

J. A. Reed	£235	0	0
S. J. Scott	217	0	0
W. Gladding	214	0	0
E. BARETROP, Walthamstow (accepted)	163	0	0
E. Good (withdrawn)	122	0	0

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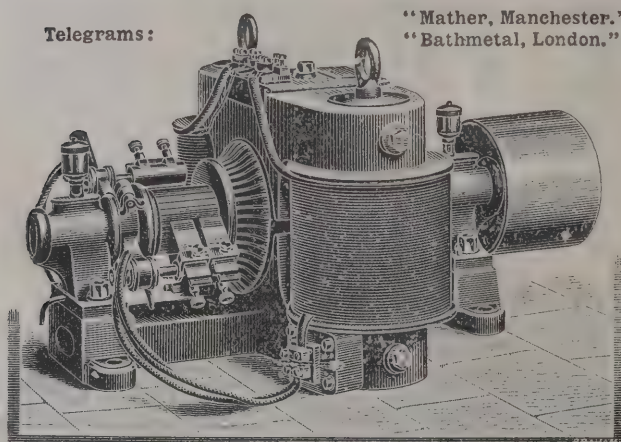
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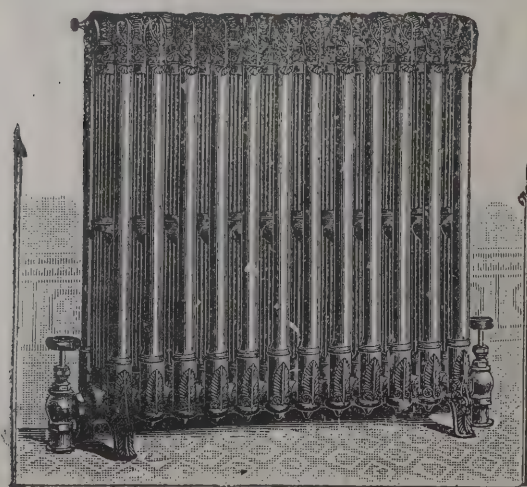
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For Rebuilding the Tower and Spire of Thrybergh Church, near Rotherham.

R. SNELL, St. Ann's Road, Rotherham (accepted) £485 0 0

WITHINGTON.

For Erection of Four Shelters at the New Recreation Grounds, Didsbury, Withington, Albert Park and Chorlton-cum-Hardy, for the Withington Local Board. Mr. A. H. MOUNTAIN, Surveyor.

O. Williams	£960	0	0
W. Stothard, Withington	770	0	0
A. Mason, Didsbury	752	6	0
J. J. Parish, Withington	716	12	0
J. BARBER, Withington (accepted)	704	11	4
J. Byrom, Bury (too late)	896	11	6

For Draining, Fencing, Kerbing, Channelling, &c., as required, at Five Recreation Grounds at Didsbury, Withington, Albert Park and Chorlton-cum-Hardy, for the Withington Local Board. Mr. A. H. MOUNTAIN, Surveyor.

Chorlton Green.

Worthington & Pownall	£108	1	9
G. Clark, Hulme	88	4	6
M. NAYLOR (accepted)	85	16	0

Didsbury.

M. Naylor	111	17	3
Worthington & Pownall	104	6	8
G. CLARK (accepted)	95	10	2

Withington.

Worthington & Pownall	267	15	9
G. Clark	236	17	0
M. NAYLOR (accepted)	217	10	0

Albert Park.

Worthington & Pownall	108	11	0
M. Naylor	107	13	3
G. CLARK (accepted)	100	17	11

Chorlton.

Worthington & Pownall	204	16	9
M. Naylor.	158	13	0
G. CLARK (accepted)	143	1	7

For the Whole Work.

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WITHINGTON—continued.

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Contract No. 1.—Chimney.

Evan, Roberts & Son, Manchester	£1,803	11	3
J. E. Johnson & Son, Leicester	1,582	0	5
Goddard, Massey & Warner, Nottingham	1,476	10	5
W. Musker, Bootle	1,424	3	0
J. Byrom, Woodfold, Bury	1,268	4	6
MASON & Co., Manchester (accepted)	1,281	7	10

Contract No. 2.—Cells, &c.

W. Musker	2,879	6	11
Evan, Roberts & Son	2,761	16	2
Goddard, Massey & Warner	2,598	11	7
J. E. Johnson & Son	2,476	2	1
J. Byrom	2,252	4	10
Mason & Co.	2,228	9	6

For the Whole Work.

W. Horsfall & Co, Leeds	4,358	14	6
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WOOLWICH.

For Alterations and Additions to the Director-General Public-house, Wellington Street, for Mr. G. H. Church. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr W. WHINCOP, 15 Kyverdale Road, Stoke Newington.

J. Chapman	£1,565	0	0
Young & Lonsdale	1,480	0	0
H. L. Holloway	1,442	0	0
Multon & Wallis	1,349	0	0
Proctor	1,300	0	0
C. Ansell	1,287	0	0
Balaam Bros.	1,260	0	0

ILLUSTRATIONS.

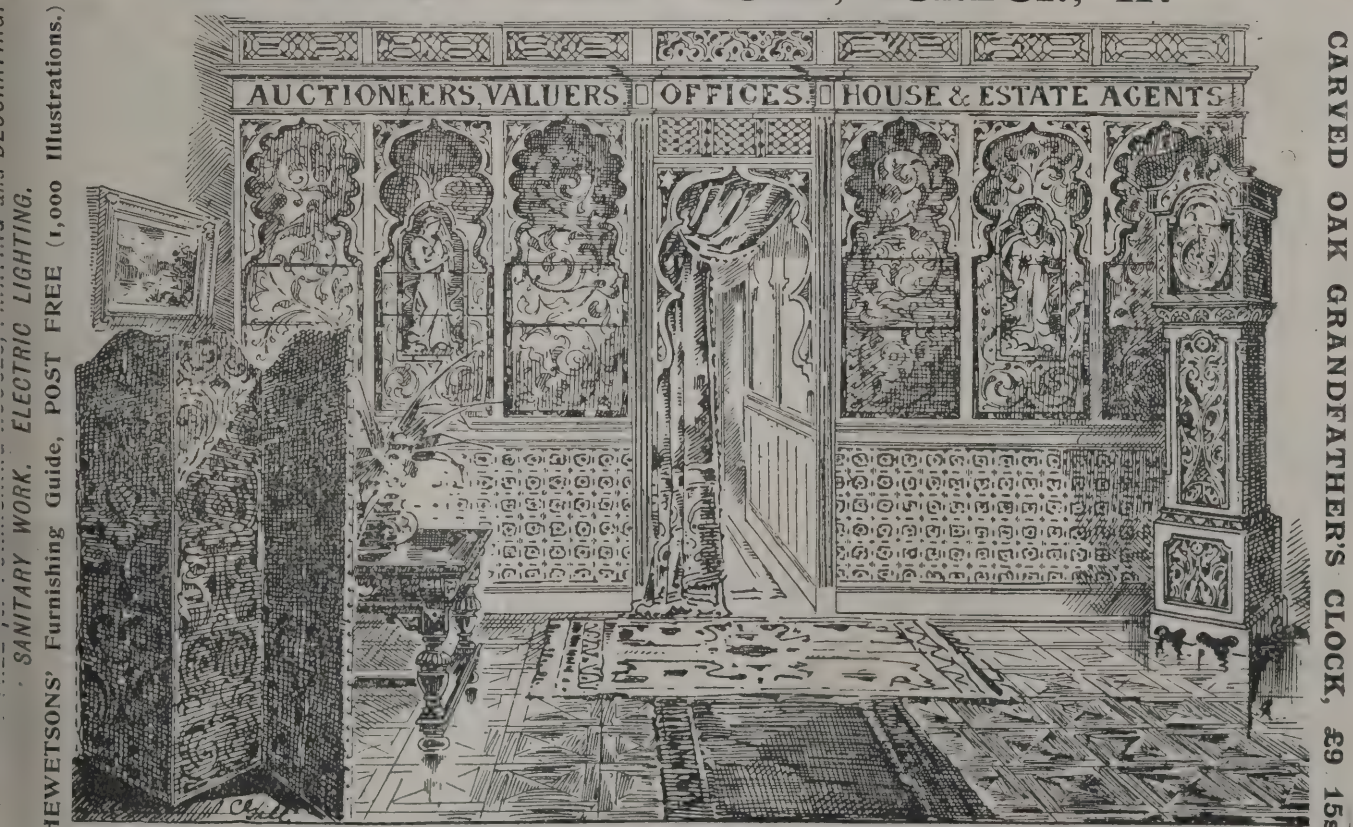
WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE HALL.

WHEATFIELD LODGE, HEADINGLEY, YORKS.—THE BILLIARD-ROOM.

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TRADE NOTES.

AT the recent exhibition held at King's College in connection with the British Institute of Public Health, much interest was evinced by experts in the well-known Parsons's radiators for warming buildings, models of which were on view. The opinion was freely expressed that their principle is the right one and a decided advance on similar apparatus. We also learn too that Messrs. Parsons & Harris, the makers, have several large orders for these in hand at their works in Sidney Grove, Goswell Road, E.C.

AT Winsters, Derbyshire, the parish church of St. John the Baptist has had a new quarter-chime clock erected in the tower, the gift of a gentleman who resides in the parish. It was constructed by Messrs. Wm. Potts & Sons, of Leeds and Newcastle-upon-Tyne, who are also making an illuminated quarter-chime clock for Hayfield parish church, in the High Peak district.

WE have been requested to inform our readers that Messrs. Baird, Thompson & Co., Limited, engineers and specialists in ventilation, heating, sanitation, cooling, drying and filtration, to enable them to expedite and facilitate the execution of their orders to the greater satisfaction of their numerous clients and to centralise their business generally, have removed their head offices to their new works at Islington. Their only address for London now is Charlton Engineering Works, Charlton Place, Islington, London, N. (directly opposite the Upper Street entrance to the Agricultural Hall), to which address all communications should be sent.

WE have much pleasure in announcing that Messrs. Pickering's, Limited, of the Globe Elevator Works, Stockton-on-Tees, have appointed Messrs. Bolton, Fane & Co., of 96 and 98 Leadenhall Street, their agents for London and district.

A LARGE clock was formally started at the church of Long Clawson, near Melton Mowbray, on August 9. It shows time on two large dials, chimes the Cambridge quarters, and strikes the hours. It has been carried out generally to the designs of Lord Grimthorpe, by Messrs. John Smith & Sons, Midland Clock Works, Derby. The whole is the gift of Dr. Swain, Long Clawson.

THE new workhouse infirmary, Guisborough, which is being erected from the plans of Mr. Thomas Stokes, architect, Thirsk, is now nearing completion. It is being warmed and ventilated throughout by means of Shorland's patent Man-

chester stoves, patent exhaust roof ventilators and improved inlet panels, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

VARIETIES.

THE authorities at Chatham Dockyard have in preparation a scheme for still further developing the extension works by constructing another basin. Plans are also to be prepared for three new docks; one of which is to be of immense size, and capable of accommodating the largest vessel likely to be built in the future. The need for larger docks is apparent, seeing that at Chatham there is not one of sufficient size to hold the cruisers *Powerful* and *Terrible*, provided for in this year's estimates. It is estimated that the total cost of the proposed works will be about 1,500,000*l*.

WE are informed that Messrs. Baird, Thompson & Co., Limited, have been successful in securing an important contract from the Japanese Government, for the introduction of their improved systems of ventilation. Lord Burton has also selected their improved system of heating for the New Municipal Buildings, Burton-on-Trent, and has instructed them to proceed with this contract. Amongst numerous contracts recently completed we may mention the following:—Darlaston New Schools, Darlaston; Yardley New Schools, Yardley; Infectious Diseases Hospital, Stratford-on-Avon; Bargeddie Public Schools, N.B.; Somerset Road Chapel, Handsworth, near Birmingham, and many others. They have also a large number of other contracts on hand.

THE Local Government Board have declined to sanction the borrowing of 27,000*l*. by the Chester Corporation for the purchase of 400 acres of land at Sealand.

MESSRS. DICKSON BROS. have obtained the contract for the Exeter, Teign Valley and Chagford Railway.

THE French Consul at Mongtze, in Upper Tonkin, has reported about the "wodmines." Originally they formed a pine forest, which the earth swallowed in some cataclysm. Some of the trees are a yard in diameter. They lie in a slanting direction and in sandy soils which cover them to a depth of about eight yards. As the top branches are well preserved, it is thought the geological convulsion which buried them cannot be of very great antiquity.



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PLANS AND ESTIMATES FURNISHED FREE OF CHARGE ON APPLICATION.

THE plans by Mr. W. H. Radford have been adopted for the sewerage of West Bridgford, a suburb of Nottingham. The works will cost about 5,000/.

A LOCAL GOVERNMENT inquiry has been held at the Town Hall, Melton Mowbray, before Colonel J. Ord Hasted, R.E., of the Local Government Board, for permission to borrow 4,050/ for improvements at the sewage works. Mr. Edmund Jeeves, the surveyor to the Local Board, explained the scheme, stating that after investigating numerous systems of sewage disposal the Board had decided to adopt the International system of ferozone and polarite as being the most economical and efficient process. In addition to the polarite filters the works will be provided with three clarifiers to economise chemicals and save labour. There was no opposition, and it is intended to carry out the work forthwith.

BUILDING AND BUILDERS.

THE Local Government Board have written to the Islington Board of Guardians sanctioning the erection of a new infirmary for 750 patients at Bowes Manor, Bowes Park, N. The cost will probably exceed 125,000/. The draft plans have also been approved for the buildings, which will take a couple of years to construct.

THE Glasgow Discharged Prisoners' Aid Society are about to erect a reception-house at junction of Cathedral Square and John Knox Street. The site is a triangular piece of ground on the east side of Cathedral Square, and the building is to be three storeys in height, and will give accommodation on the basement floor or ground level for breakfast-hall, with kitchen, &c., for men. On the principal floor is office accommodation for superintendent and clerks, and also a large room for women. On the upper floor two apartments are provided for the caretaker, and dormitory accommodation for men. The architects are Messrs. Campbell Douglas & Morrison.

PLANS have been passed for an enlargement to the Broomloan Road Public School, Govan, providing additional accommodation for 925 scholars. The plans include a large swimming pond, as also a manual instruction workshop for boys and a laundry for girls. The estimated cost is about 17,500/., exclusive of site. The architects for the enlargement are Messrs. Barclay, of Glasgow.

THE Rhyl Improvement Commissioners have contracted for works which will entail an expenditure of about 24,000/.

A contract of 11,800/ is let to Mr. Briggs, of Birmingham, and consists of a new main drain and sewage outfall works, by which the sewage will be carried three-quarters of a mile out to sea, being discharged on the ebb tide, thus insuring its carriage right out to sea. The formation of the new marine lake is entrusted to Mr. G. Law. It will be nearly 30 acres in extent, and cost when completed about 8,000/.

NEWBURY TECHNICAL INSTITUTE.

THE new Technical Institute in Newbury, which was opened by Mr. Alfred Waterhouse, R.A., of Yattendon Court, occupies a site in contiguity to the old Literary and Scientific Institution. The new buildings are placed somewhat to the rear. The architect, Mr. Walter H. Bell, had many difficulties to contend with, but has succeeded by a judicious adaptation of the old portions, and a skilful use of the space at his command, in providing a building which will enable the technical instruction committee to carry on their useful work in an enlarged and more systematic manner. There is an entrance from the Albert Road, but the principal entrance will be in Northbrook Street. In the library an alteration has been made by which, for the future, books may be passed to borrowers over a counter. On the ground floor, a corridor connects the old building with the new. On this floor there are three large rooms to be used for classes in science, woodwork, shorthand and other subjects. The first floor is reached by a handsome staircase in the front part of the building, or by another staircase for general use, situated about the middle of the building. The principal staircase is lighted by a large window glazed with tinted glass, and appropriately decorated with the borough arms in the upper part. The museum will now be located in the rooms which have hitherto been used for the art classes. The school of art, 42 feet by 28 feet, is the chief feature in the new structure; it is a handsome room lighted by three large windows, and well adapted to the purposes for which it is designed. A gallery adjoining, and the art master's room, with lavatories and cloak-rooms conveniently situated, completes the arrangements on the first floor. The caretaker's apartments are situated on the top floor of the Institute. The contractor was Mr. Samuel Elliott, of the Albert Steam Joinery Works, and sub-contracts for the gas and water-fittings were executed by Mr. Ernest Harris and Mr. S. Knight, jun.

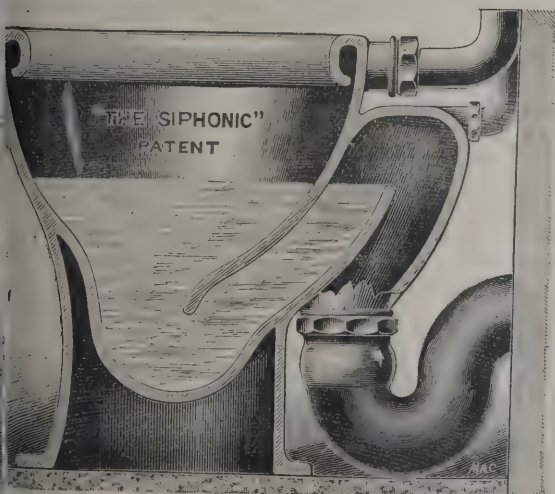
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THE LATE CHARLES LIDDELL.

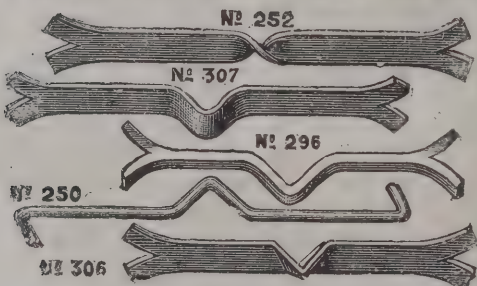
MR. CHARLES LIDDELL, the contractor, has just died at the age of eighty-one. He was the son of the Rev. H. G. Liddell, rector of Ensington, Durham, and a brother of the late Dean of Christ Church. Early in life Mr. Liddell was employed under George Stephenson in the construction of the Birmingham and Derby Railway, the Grand Junction, and the line from Rugby to London. With Robert Stephenson he assisted at the making of the Leicester and Swannington, the Syston and Peterborough and other lines. With Mr. L. Gordon, who was then his partner, he was engineer-in-chief of the Newport and Abergavenny, and more than a dozen other railways. He assisted in the same capacity in the construction of the Danube and Black Sea Railway in the Dabrudja—now part of Roumania—and the making of the Novara and Lake Orta Railway in Italy. His latest works have been the prolongation of the Metropolitan Railway to Aylesbury, and the new Manchester, Sheffield and Lincolnshire Railway to Nottingham. As a partner in the firm of R. S. Newall & Co. Mr. Liddell at one time took an active part in the laying of telegraph cables. During the war in the Crimea he laid the cable between Varna and Balaclava. Mr. Liddell was indefatigable from the time he joined Mr. Stephenson till within a week of his death. Whether travelling, standing at a drawing-table in his office, or what he called resting at his home in Sussex, he never ceased working during his waking hours.

BORE-HOLE WELLS.

A PAPER was read by Mr. H. Davey, C.E., on "Bore-hole Wells for Town Water Supply," at the meeting of the British Association. He said that at the Cardiff meeting of the Association he proposed a new system of bore-hole wells for town water supply. Since that time the system has been carried into effect at several places, and he described one of the most important examples of executed work, viz. that of the Netherley pumping-station of the Widnes Waterworks. The subject was dealt with under two heads. In procuring water for town water supply it is the usual and necessary practice to provide duplicate pumping engines, and where two engines are made to pump from the same well the well must be very large,

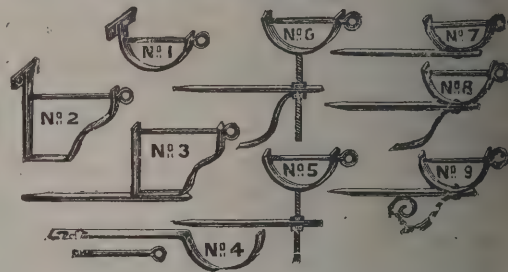
that it may accommodate two sets of pumps. Such wells are usually 12 feet to 14 feet in diameter. To sink such a well in the ordinary way is a very long and costly undertaking, especially if soft strata be met with, where lining becomes necessary. On the completion of the well it may be necessary to drive adits to increase the water supply. A simple bore-hole is made very cheaply and very expeditiously. Four 30-inch bore-holes can be put down in a very small fraction of the time required to sink a 12-foot well. Instead of making a large well, the author puts down four bore-holes to accommodate the pumps for duplicate pumping engines—a pair of pumps to each engine. The bore-holes being completed, the pumps are lowered into them and coupled-up to the permanent engines. Immediately that is done the water found in the bore-holes can be pumped and supplied to the town. Should it be insufficient, then a small well would be sunk in the dry to the bottom of the bore-hole pumps. The water being kept down by the pumps, the bore-holes at the level of the pumps would be connected to the centre well, and adits driven to collect more water. Should the bore-holes yield sufficient water, it would not be necessary to sink the well. It would be absurd to advocate any particular system of well-sinking as being universally applicable; this system, however, of making wells offers advantages under favourable conditions, but the advisability of its adoption in any particular case must be a matter of judgment with the engineer planning the work. The bore-holes at Netherley, two in number, are sunk in red sandstone rock, and are placed 20 feet apart, each bored to a diameter of 30 inches for a depth of 200 feet, and to a reduced diameter of 18 inches for a further depth of 200 feet and 300 feet respectively, thus making the first hole 400 feet deep and the second one 500 feet deep. On the completion of the boring the water stood 70 to 80 feet from the surface of the ground, when the quantity pumped by the old engine on the same site was $1\frac{1}{4}$ million gallons per day. The main pumps were then lowered into the bore-holes, each pump extending to the bottom of the large part of the hole, 200 feet from the ground-level. In that position the pumps were suspended from a cast-iron bed-plate supported on a concrete foundation formed round the top of the holes, a block of oak being inserted between the head of the pump and the bed-plate. In this suspended position the pumps work without the slightest unsteadiness. The engines were made for the purpose of pumping $2\frac{1}{4}$ million gallons per day, but it was found that, working up to their full capacity of $2\frac{3}{4}$ million gallons, the full

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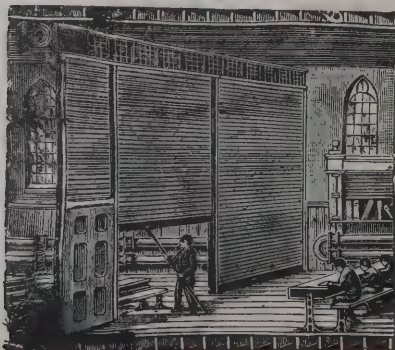
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yield of the bore-holes was not reached. On starting the new pumps it was found that when pumping 2½ million gallons per day the water-level was lowered to 100 feet from the surface of the ground.

AMATEUR CONTRACTORS.

A PAPER was read on Monday in the section of Economic Science at the meeting of the British Association at Oxford by Mr. Sidney Webb, on "The Alleged Economic Heresies of the London County Council." He said:—The policy of the London County Council has been intelligently criticised, from the point of view of economic science, mainly under three heads. Instead of "buying its labour in the cheapest market," as it was termed, it has from the first striven to adopt as its standard the trade union rates of wages, and to assert a "moral minimum" of earnings below which it was inexpedient that any London citizen should be allowed to sink. Moreover, not content with proceeding on these lines as regards the workmen whom it directly employs, it has sought throughout to secure that all contractors executing its work should adopt the same principle. Finally, it has endeavoured, wherever possible, to dispense with the middleman *entrepreneur*, and to substitute salaried supervision and management directly under public control. On all three points it has been accused of economic heresy by those who believed themselves to be expressing the conclusions of economic orthodoxy. On all three its action is largely influencing public opinion. It seems desirable, therefore, to set forth precisely the facts and to reconsider the economic position.

After prolonged discussions, repeated at intervals during four years, it has become settled policy (a) to pay in each trade the recognised standard rate of wages, (b) to give no adult male workman less than 6d. per hour and no adult woman less than 18s. per week. The labour policy of the London County Council, whether with regard to skilled or to unskilled labour, may be explained as the deliberate choice of that form of competition which secures the greatest possible efficiency as compared with the form which secures the greatest apparent cheapness. Public offices may be filled in one of two ways. We may on the one hand practically put the places up to auction, taking those candidates who offer to do the work for the lowest wages; or on the other hand we may first fix the emoluments and then pick the best of the candidates coming forward on those terms. The London County Council has

learned by long and painful experience that there is so much difference between competence and incompetence that it does not dream of seeking to save money by taking the candidate who offers his services at the lowest rate. Whether the post to be filled be that of an architect or a carpenter the wage to be paid is first fixed at a rate sufficient to attract the best class of men in the particular occupation. Then the most competent candidate that can be found is chosen. With regard to the lowlier grades of labour a further consideration enters in. The London County Council, responsible as it is for the health of the people of London, declines to use its position as an employer deliberately to degrade that health by paying wages obviously and flagrantly insufficient for maintenance, even if competition drives down rates to that pitch.

So far, indeed, is the Council's action from being economically heretical, as is commonly supposed in West End drawing-rooms, that it is exactly what the instructed economist would nowadays recommend. The economic heretics, in fact, are those who, in flat defiance of Adam Smith, M'Culloch, Mill and Marshall alike, persist in assuming that there is some obligatory "law" that the pressure of competition ought, without interference from man, to be allowed so to act as to degrade the standard of life of the whole community.

Some critics demur to any interference with the freedom of contractors, and denounce as economically heretical the Council's standing order confining the Council's work to such firms as adopt the current standard rates of wages. The very object of industrial competition, they say, is to keep the cost of production down to the lowest possible point, and any interference with the contractor's freedom to do his business in his own way tends to increase that cost. These criticisms confuse cost of production with expenses of production. What the community has at heart is a reduction of the cost of production—that is, of the efforts and sacrifices involved in getting the object desired. It was in order to put a stop to the constant tendency of contractors to nibble at the current standard wages that the London County Council inserted its celebrated fair wages clauses. These clauses, it will be observed, leave open to contractors every chance of profit which comes from reduction of the cost of production. By concentrating the contractor's energy and attention on this point they presumably increase the fierceness of that part of the competitive struggle which promotes the public good. Here, again, the key-note of the Council's policy is, not the



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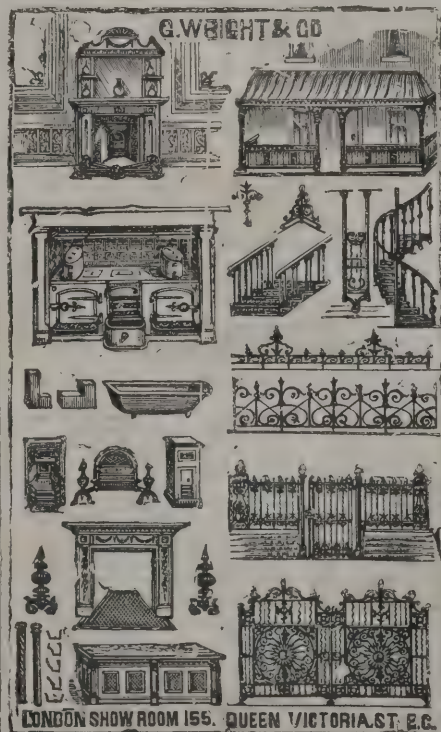
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WORKS, ROTHERHAM. Estab. 1854.

abolition of competition, but the shifting of its plane from mere cheapness to that of industrial efficiency. The speeding up of machinery, the better organisation of labour, the greater competency of manager, clerk, or craftsman, are all stimulated and encouraged by the deliberate closing up to the contractor of other means of making profit.

With regard to the Council's determination to dispense wherever possible with the contractor, and execute its works by engaging a staff of workmen under the supervision of its own salaried officers, this has been fiercely attacked as being palpably and obviously opposed to political economy and business experience. Mr. Webb showed by figures that there had been a saving of 2,420*l.* or 12·33 per cent. in the first sixteen operations carried out by the Council without a contractor. It is usually assumed, continued Mr. Webb, by the Council's critics that its policy of eliminating the contractor is an unparalleled innovation unknown outside London. A little knowledge of the action of local governing bodies elsewhere would prevent this mistake. The Corporation of Birmingham is going far beyond the London County Council. When we thus find even the county councils in rural districts giving up the contractor, it ceases to be surprising that the Town Council of Manchester, in the city of Cobden and Bright, now manufactures its own bass-brooms, or even that the ultra-conservative Commissioners of Sewers of the City of London actually set the County Council an example by manufacturing their own carts. The superiority of direct municipal employment under salaried supervision to the system of letting out works to contractors has, in fact, been slowly borne in on the best municipal authorities all over the country by their own administrative experience, quite irrespective of social or political theories. With regard to the integration of processes, Mr. Webb pointed out that within the last twenty years the maxim in large industries was "Never buy from anyone else what you can manufacture for yourself."

He concluded by asking, Why is the elimination of the subsidiary *entrepreneur* more practicable now than it was in the last generation? It would take too long to examine the fundamental causes and conditions of this change in industrial organisation. Most changes in social structure depend, in the long run, upon individual character; possibly there has been a growth in the number of men who can be trusted to work efficiently and honestly as salaried managers instead of for their own personal profit. Possibly, too, as industrial organisation becomes more complex, the advantage to the consumer in

directly controlling the production of every article he requires becomes more apparent. All improvements in social organisation, too—steam, telegraphy, the free use of the printing press, and now the telephone—facilitate the massing of workmen under single generals of industry, able efficiently to control larger and more heterogeneous and more complex industrial armies than could be managed by the captains of the past generation. Finally, as regards the substitution of the collective for the individual management of industry, it is evident that this will have been rendered increasingly practicable by the perfecting of democratic organisation. All these and other influences are but fragmentary suggestions towards the explanation of a change in industry of which the supposed economic heresy of the London County Council is but one out of many manifestations. Formerly the best business management was that which itself managed least. Nowadays the best business management is that which can safely and efficiently administer most. The integration of productive processes under direct control of the consumers may or may not be economic heresy; the business history of England for the past twenty years indicates that it is industrial orthodoxy.

Mr. Edward Atkinson was surprised that Mr. Webb had so completely justified the principle of competition. The County Council had successfully competed with contractors by dispensing with contractors. High wages and cheapness of production was the rule which prevailed in the United States, and was being tried successfully by the Council.

Professor Nicholson observed, with respect to getting rid of the middleman, that this doctrine was not new, but was earnestly supported by Adam Smith as one of his cardinal principles.

General Strachey agreed with what Mr. Webb had said. In days gone by all the railways were constructed by the contractor. Now it was hardly ever done.

Professor Foxwell said that the tendency of the aggregation of many businesses in one hand was by no means universal, and there were striking instances of an opposite character. He was afraid that the irritation at the inevitable inequality in human ability and character and the necessary and justifiable inequality of emolument was one of the most striking and least attractive elements of the modern democracy.

Mr. Bond said there was an impression that the London County Council overpaid their unskilled workmen and underpaid the most highly skilled. The Council might do better than endeavour to master the details of every trade, and he disapproved the rigid adherence to trade unions.

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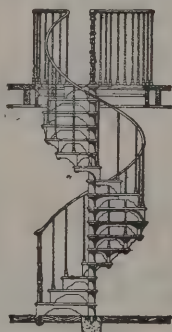
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THE TRADE OF CHICAGO.

THE report on the trade of the Consular district of Chicago states that the trade in 1893 shows a falling off compared with that of the preceding year, owing to universal dullness consequent on the financial crisis; but the decrease was not large, and in making the comparison the fact must be taken into consideration that almost every year had shown large and successive increase, and that the year 1892 was an especially prosperous one. The year opened with great activity, and promised at least an average percentage of increase in the volume of business till the panic caused general depression in transactions. The record, based as on previous occasions on a summary compiled by the best authorities, and on such official returns as are available, shows a decrease of about 6.75 per cent. as compared with the record of 1892, the total trade being estimated in round figures at 295,800,000, or 21,300,000. less than in 1892, when the estimate amounted to 317,100,000.

The great prosperity which marked the wholesale trade of Chicago in 1892 lasted during the early months of the following year, until the financial crisis caused dullness in all branches of industry and resulted in the considerable falling off of 9½ per cent. in value of business done compared with the preceding year. The continued demand for many goods consequent on the exhibition in some measure prevented wider stagnation, but country trade was dull, stocks were not replenished in the same degree as usual, and all articles as a rule were cheaper, many of them having never been so low in price as during the last winter.

It is natural that a sensible decrease should be shown in the lumber trade after the greatly-increased consumption in 1892 for the buildings of the exhibition and of those connected with it, and the receipts fell from 2,200,000,000 feet to 1,600,000,000 feet. For the same reason all industries associated with the building trade were comparatively depressed. The iron industry declined, business in structural iron falling off about 50 per cent., some of the largest manufacturing works were temporarily suspended, and the coke iron blast-furnaces were all closed in the autumn.

The manufacturing trade likewise suffered from general depression caused by the financial panic, and it is estimated that there was a decrease in the entire value of production to the extent of nearly 4½ per cent., compared with that of the preceding year. The total value of the product of 1893 is estimated at 117,275,000, the falling-off being mainly due to a

decrease in the packing business, in the wood, brick, and stone and textile fabric industries, and in the production of iron and steel.

The iron and steel industry fell off nearly 2,000,000. in value of production, which was estimated at 12,950,000.

The number of rolling-mills was reduced from six to five, and of foundries from 62 to 53. The output from the mills, which in 1892 was valued at slightly over 5,000,000, fell to 2,887,000, but an increase of about 680,000. brought the output of the foundries to an estimated value of 2,990,000. The large works of the Illinois Steel Company shut down early in the autumn, and the branch works at Joliet were closed nearly the whole of the year. The product of the 82 machinery and malleable iron establishments was estimated at a value of 2,350,000, or about 350,000. more than in 1892. There was a decrease of nearly 10,000 men in the total number of hands employed in the different iron and steel industries, and a reduction of about one-third in the aggregate amount of wages paid, which scarcely reached 2,700,000. Owing to the shorter demand for ore mining has been less active, especially in the older districts, where cost of extraction is greater than at some of the lately discovered mines. The brass and copper industries developed an increased output of 2,637,000. in value, the production in 1893 being estimated at 13,433,000. owing to the unusually large employment of material at the World's Fair, and for the numerous hotels, restaurants and other buildings constructed to meet the requirements of expected visitors, as well as to the greatly increased output from smelting and refining works, which alone was valued at about 8,500,000. The tin, stamped and sheet metalware industries turned out to the approximate value of 1,413,000, or slightly less than in either of the two preceding years. The total number of workers employed in the brass and copper industries was larger by 7,000 than in 1892, amounting to 16,300 hands, and the aggregate amount of wages paid was about two-thirds greater. The whole manufacturing trade in iron and wood, including car and bridge building, elevators and sewing machines, is stated to have amounted to 9,258,000. against 8,950,000. in 1892 and 8,495,000. in 1891.

The panic which cast so depressing an influence over trade in this district during the latter half of the year may be greatly attributed to depreciation in the value of silver, to over-production, and perhaps in some degree to tariff uncertainty. It was not a local panic, but part of a storm-wave which travelled rapidly from east to west, and swept over the whole of

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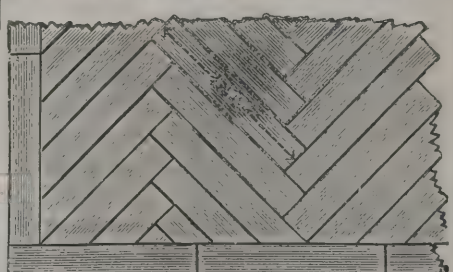
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	ROYAL MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
	SILVER MEDAL—PARIS, 1889.

the United States. Even if its origin cannot be traced so far back as the Baring failure, that first cloud in the horizon, when so much stock was thrown on the market here, it was probably accelerated by the great Australian bank failures, which caused a certain feeling of insecurity among communities here, judging from those disasters, as to the stability of their own banks.

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PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

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14612. John Morcombe Bromley Baker, for "An improved method of and apparatus for deodorising and disinfecting water-closets, urinals, sinks and the like."
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14715. John Quarnby, for "Improvements in traps for drains, water-closets and the like."
14752. Lawrence Robson, for "Holding devices suitable for connecting sash-cords to window-sashes."
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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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BLAGDON.—Aug. 28.—For Alterations and Additions to Schools. Mr. F. W. Wills, Architect, Foster's Chambers, Small Street, Bristol.

BOLTON.—Aug. 28.—For Constructing Weir, &c. Mr. W. H. Brockbank, Town Hall, Bolton.

BOLTON.—Sept. 3.—For Taking Down and Rebuilding Steel Girder Bridge. Borough Surveyor, Town Hall, Bolton.

BRIGHOUSE.—Aug. 28.—For Alterations and Reseating Church. Mr. Wm. Swinden Barber, Architect, 28 George Street, Halifax.

BURTON-ON-TRENT.—Aug. 31.—For Alterations to Wins-hill Girls' School, and Erection of Infants' School. Mr. Reginald Churchill, St. Paul's Square, Burton-on-Trent.

CAMBRIDGE.—Sept. 14.—For Construction of about 3,000 Yards of Brick Sewers and 90,000 Yards of Pipe Sewers, with River Crossings, Manholes, &c. Mr. J. T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CHRISTCHURCH.—Aug. 25.—For Adding Block to Men's Quarters at the Workhouse. Mr. E. H. Burton, Architect, Bournemouth.

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DEPTFORD.—Sept. 12.—For Filling-up with Dry Rubbish the Basin in Foreign Cattle Market. Guildhall, E.C.

DURHAM.—Sept. 3.—For Building Footbridge. Town Clerk, Durham.

ECCLES.—Sept. 5.—For Constructing Pipe Sewers. Mr. A. C. Turley, Town Hall, Eccles.

FARNHAM.—Sept. 4.—For Building School. Mr. J. Alfred Eggar, Architect, Farnham, Surrey.

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FULHAM.—Sept. 6.—For Heating and Hot-water Supply. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

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GREAT GRIMSBY.—Aug. 29.—For Building Higher Grade Board School. Mr. H. C. Scaping, Architect, Victoria Chambers, Grimsby.

HARROGATE.—Sept. 7.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

HASTINGS.—Aug. 27.—For Building School. Messrs. Jeffery & Skiller, Architects, 5 Havelock Road, Hastings.

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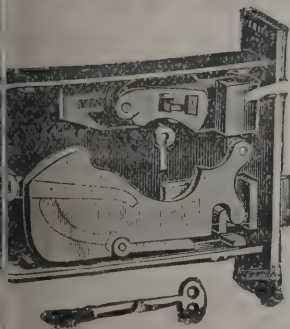
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IPSWICH.—For Building Dairy Institute. Messrs. Wm. Eade and E. T. Jones, Architects, Cornhill Chambers, Ipswich.

KIRKCALDY.—Aug. 25.—For Mason, Joiner, Slater, Plumber and Plaster-work at the Public Library. Mr. W. L. Macindoe, Deputy Town Clerk, Kirkcaldy.

LISBURN.—Sept. 6.—For Construction of Extensive Works for the Water Supply. Mr. John Lanyon, Engineer, Northern Bank Chambers, Belfast. Mr. Richard Young, Lisburn, Town Clerk.

LIVERPOOL.—Sept. 18.—For Erection of Superstructure of proposed Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LOUGHAGHRY.—Sept. 5.—For Alterations to Church. Mr. Wm. Batt, Architect, Garfield Chambers, Belfast.

LUDLOW.—Aug. 29.—For Constructing Stoneware Pipe, Sewers, &c. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

MEVAGISSEY.—Sept. 3.—For Building Lifeboat House. Engineer, National Lifeboat Institution, 17 Victoria Street, Westminster, S.W.

NEWBOLD.—Sept. 11.—For Building School. Mr. J. W. Fearn, 31 Devonshire Street, Chesterfield.

NEWTON HEATH.—Aug. 29.—For Additions to Police Station. Mr. T. de Courcy Meade, City Surveyor, Town Hall, Manchester.

PANNAL.—Sept. 3.—For Pulling Down and Rebuilding Hotel. Mr. T. Winn, Architect, 90 Albion Street, Leeds.

PLYMOUTH.—Aug. 27.—For Building Retaining Wall. Borough Engineer, Plymouth.

POOLE.—Aug. 29.—For Constructing Stoneware Pipe Sewers. Borough Engineer, Poole.

RADNOR.—Sept. 10.—For Pulling-down and Restoring Nave and Tower of St. Michael's Church, Beguildy. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

RUNCORN.—Aug. 28.—For Cutting and Laying Pipe Sewer. Mr. E. Marshall, Town Hall, Runcorn.

SANDBACH.—Sept. 1.—For Constructing Waterworks. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

SEDBERGH.—Aug. 25.—For Building Farmhouse. Mr. S. Shaw, Architect, Kendal.

SMETHWICK.—Sept. 14.—For the Construction of about 1,900 Yards of Brick Sewers and Conduits, and 3,700 Yards of Pipe Sewers with Manholes, Lampholes, Bell-mouths, &c. Messrs. Harris & Harris, 9 Bennett's Hill, Birmingham.

SOUTHEND-ON-SEA.—Aug. 27.—For Laying about 250 Yards of 21-inch Pipe Sewer. Mr. C. S. Copley, Borough Surveyor, Clarence Road, Southend.

SOUTHWOLD.—Aug. 30.—For Constructing Pipe Sewers, Sewage Tanks, &c. Mr. F. Beesley, 11 Victoria Street, Westminster.

ST. PANCRAS.—Sept. 3.—For the Construction of a Pipe Sewer in Albany Street. Mr. Wm. N. Blair, C.E., Vestry Hall, Pancras Road.

SEVENOAKS.—Aug. 29.—For the Supply of 300 Cubic Yards of Broken Granite. Mr. Jabez Mann, C.E., Argyle Road, Sevenoaks.

TORQUAY.—For Building Church. Mr. John Watson, Architect, Lower Terrace, Torquay.

WALSALL.—Aug. 29.—For New Buildings at Queen Mary's Schools. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WALTHAMSTOW.—Sept. 7.—For Making-up and Laying Concrete Flags. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Sept. 7.—For Supplying and Fixing about 60 Rods of Oak Park Fencing. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WEST MALLING.—Aug. 28.—For Repairing, Painting, &c. at Workhouse. Master of the Workhouse, West Malling.

WHITTINGHAM.—Aug. 26.—For Painting the Asylum, Whittingham, near Preston, Lancs.

WORSBOROUGH.—Aug. 30.—For Alterations to Board School. Messrs. Senior & Clegg, Architects, 15 Regent Street, Barnsley.

WORKSOP.—Aug. 25.—For Sinking Well. Mr. J. Allsopp, Engineer, Worksop.

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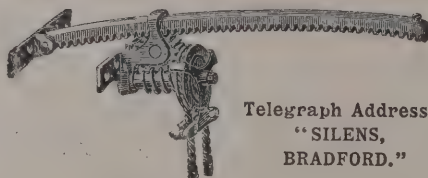
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WORTHING.—Aug. 27.—For Building Pumping Station, Chimney Shaft, Service Reservoir, Laying Cast-iron Mains, &c. Mr. J. Mansergh, 5 Victoria Street, Westminster.
YORK.—Aug. 29.—For Works required in the Erection and Completion of a large Riverside Warehouse for Messrs. H. Leatham & Sons. Mr. W. G. Penty, Architect, York.

TENDERS.

ALDEBURGH.

For Building Two Cells and Alterations and Repairs at Portland House, Aldeburgh, to Convert it into a County Police Station, for the East Suffolk County Council. Mr. H. MILLER, County Surveyor, 16 Museum Street, Ipswich.
Stannard, Aldeburgh £296 10 0
Carter, Saxmundham 236 0 0
COOPER & SON, Aldeburgh (accepted) 229 12 5

AYLESBURY.

For Erection of Proposed Public Baths, Aylesbury, for the Local Board of Health. Mr. GUEST LUCKETT, Architect, Virginian Cottage, Aylesbury.
W. Lee £2,950 0 0
A. Groves 2,856 0 0
H. & C. Burden 2,780 0 0
W. Abbott & Son 2,780 0 0
J. S. Kimberley 2,676 0 0
G. Darlington 2,660 0 0
H. Sherwin 2,541 0 0
G. Gibson 2,440 0 0
C. Hunt 2,349 0 0
H. Hill 2,325 0 0
T. Grimsdale 2,225 0 0
J. Wallis & Sons 2,120 0 0
H. Fincher & Son 2,049 0 0
W. SIAREY (accepted) 1,999 0 0
For the Erection of Two Cottages in Albion Street, Aylesbury, for Mr. D. Titmuss, Luton, Beds. Mr. GUEST LUCKETT, Architect, Virginian Cottage, Aylesbury.
JEWELL (accepted) 318 0 0
No competition.

BANTRY.

For Improvement Works, Kilmocomege Burial Grounds, for the Guardians of Bantry Union.
T. Murphy, Kealkil £196 0 0
James Cotter, Bantry 179 0 0
John Cotter, Bantry 173 10 0
P. Hurley, Cahermuckee 165 0 0
D. HURLEY, Lisheen (accepted) 155 0 0

BUCKSHAW.

For Building Hunting Stables at Buckshaw, Dorset, for Colonel the Hon. Everard Digby. Mr. J. FEACEY, Architect, Dorchester.
RENDEL & Co., Dorchester (accepted) £1,100 0 0

CAIRO.

For Supply of Twenty-four Engines and Tenders, for the Egyptian Government Railways.
Hawthorn-Leslie, England £60,600 0 0
Berlin, Germany 55,488 0 0
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Metallurgique, Belgium 51,844 0 0
Beyer-Peacock, England 51,500 0 0
Alsacienne, Germany 51,085 0 0
Locomotive Fabrik 50,895 0 0
Hohenzollern, Germany 50,601 0 0
Machinen Fabrik, Austria 50,420 0 0
Actien Gesellschaft, Austria 50,373 0 0
Vienna, Austria 50,246 0 0
Vulcan, Germany 49,934 0 0
Suise, Switzerland 49,842 0 0
Hanoverische, Germany 49,423 0 0
Henschell & Son, Germany 49,390 0 0
Sachsche, Germany 48,742 0 0
Dübs, Scotland 47,760 0 0
Austro-Hungary, Austria 47,476 0 0
Sharp, Stewart & Co., Scotland 46,560 0 0
Marcinelle & Couillelt, Belgium 44,612 0 0
Cockerill, Belgium 44,121 0 0
Société des Forges 44,121 0 0
G. Ansaldo & Co., Italy 43,520 0 0
Neilson, Scotland 41,280 0 0
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J. W. Darwent, Sheffield	£4,510	0	0
G. Lawson, Edinburgh	4,028	0	0
J. H. Vickers, Nottingham	3,447	7	11
S. Johnson, Irlams-o'-th'-Height	3,390	0	0
G. Hall, Sheffield	3,258	16	9
R. Holmes & Co., Chesterfield	3,020	0	0
J. TOMLINSON, Derby (accepted)	2,979	0	0

CRAWLEY.

For Building Shops and Fronts to Houses at Handcross, near Crawley, for Mrs. Bradley. Mr. C. H. BURSTOW, Architect, 40 North Street, Horsham.

Pannett Bros., Horsham	£296	13	0
M. Etheridge, Horsham	237	15	0
P. Peters, Horsham	220	0	0
Rowland Bros., Horsham	197	0	0
Peskett & Ayling, Horsham	196	15	0
G. WHEATLAND, Handcross (accepted)	163	0	0

CRICKLADE.

For Rebuilding the Congregational Sunday School. Mr. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

J. COLBORNE, New Swindon (accepted)	£124	0	0
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CROOK.

For Additions to Schools, Pease's West, Crook. Mr. H. T. GRADON, Architect, Durham.

Accepted Tenders.

J. J. Craman, Willington, other trades	£1,097	19	0
J. Wylie, South Shields, slater	103	0	0
R. Thompson, Bishop Auckland, painter and glazier	23	15	0

DURHAM.

For Building Two Houses, The Avenue, Durham. Mr. H. T. GRADON, Architect, Durham.

Accepted Tenders.

Rhodes & Son, Neville's Cross, other trades	£559	5	11
G. T. Manners, Durham, carpenter and joiner	280	0	0
Heron & Brown, Durham, plumber	100	11	10

DUNOON.

For Constructing Impounding Dam, with Concrete Breast Wall and Cast-iron Valves and Fittings, &c. Mr. MACKINTOSH, Burgh Surveyor.

G. Watson & Sons, Partick	£1,806	14	5
Kerr & Melville, Dunoon	1,546	14	3
R. C. BREBNER, Edinburgh (accepted)	1,264	10	1
D. Cunningham & Son, Kilbarchan	1,252	7	3
W. Eadie, Paisley	1,236	18	4
Engineer's estimate	1,200	0	0

EARLS BARTON.

For Erection of a Boot and Shoe Factory, Earls Barton, for Mr. A. Baker, Shoe Manufacturer. Messrs. MOSLEY & ANDERSON, Architects and Surveyors, Goodyear Chambers, Northampton. Quantities by Architects.

J. B. Clarke, Northampton	£335	0	0
W. Gregory & Son, Northampton	334	0	0
J. Garrett, Northampton	326	14	0
G. Henson, Wellingborough	320	0	0
Wilford & Judkin, Northampton	318	10	0
Sparrow, Rushden	318	0	0
T. & C. Berrill, Irchester	292	0	0
F. JOHNSON & SON, Earls Barton (accepted)	287	6	

FARNHAM.

For Building School for about 350 Children and Teacher's Residence, at the Bourne, for the Farnham School Board. Mr. PAXTON H. WATSON, Architect, West Street, Farnham.

Mid-Kent Building and Contracting Works	£3,293	0	0
T. H. Kingerlee, Oxford	3,265	0	0
Martin, Wells & Co., Aldershot	3,224	0	0
Morris & Sons, Sunningdale	3,118	0	0
Goddard & Sons, Farnham	3,112	0	0
Bulled & Co., Croydon	3,050	0	0
Tompsett & Kingham, Farnham	3,046	0	0
A. Wallis, Balham	2,988	0	0
G. Kemp, Aldershot	2,930	0	0
J. BOTTRIL & SON, Reading (accepted)	2,859	0	0

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H. & J. Martin, Limited, Dublin	5,357	0	0
S. H. Bolton & Sons, Dublin	4,890	0	0
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J. Sweeney & Son, Birr	4,585	0	0
W. Conolly & Son, Dublin	4,500	0	0
J. Broderick, Athenry	4,480	0	0
D. M'Lynn, Sligo	4,450	0	0
Collen Bros., Portadown	4,300	0	0
M. J. MARTIN, Portumna (accepted)	4,035	0	0

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For New Wing and Alterations to Heatherdene Convalescent Home, Harrogate. Mr. JOHN ELTRINGHAM, Architect, 62 John Street, Sunderland.

Whole Tenders.

W. Nicholson & Son, 9 South Brook Street, Leeds	£3,840	0	0
W. Sixton, Harrogate	3,574	0	0
D. Simpson, Duchy Road, Harrogate	3,460	0	0
J. Simpson, Albury Villas, Harrogate	3,390	0	0
T. Linskill, Harrogate	3,278	0	0
W. Topham, Harrogate	3,165	0	0
W. Ives & Co., Gateland Works, Shipley	3,099	0	0

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R. Birkenhead, Harrogate	1,494	0	0
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W. Wilcox, Church Street, Harrogate	570	0	0
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Plumber.

Kirtley, Sunderland	416	0	0
Wilkinson, Sunderland	340	0	0
Arinson, Sunderland	330	0	0
Braithwaite, Leeds	327	0	0
Snowdon	307	0	0

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Braithwaite	118	0	0
J. Mills, Leeds	116	0	0
Arinson	113	0	0
Snowdon	113	0	0

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Slater.

Shepherd, Harrogate	£92	0	0
Baynes, Harrogate	88	0	0
Season, Leeds	84	5	0

Plasterer.

Blackburn	189	10	0
Nicholson, Leeds	185	0	0

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For New Pier, Isle of Rum, Hebrides, for Mr. G. Bullough. Mr. JOHN SCOTT, Engineer.

W. Bain, Creaquny	£3,200	0	0
MACANDREW & Co., Ludgate Hill, London (accepted)	3,090	0	0

KEMNAY.

For Additions to Kemnay Public School.

Mason Work.

Alexander & Davidson, Cluny	£153	0	0
W. Lauder, Ashfield, Inverurie	147	0	0
J. Smith, Kintore	145	0	0
L. DINNIE, Cluny (accepted)	120	0	0

Carpenter Work (exclusive of Desks and Furnishings).

Bruce & Chalmers, Kemnay	78	14	0
A. Bruce, Kemnay	78	10	0
W. WRIGHT, Bridge, Alford (accepted)	72	10	6

Slater Work.

G. Mitchell, Inverurie	30	12	1
W. AULD, Kemnay (accepted)	29	16	0

Plaster Work.

J. Sivewright, Inverurie	17	0	0
R. MOIR, Inverurie (accepted)	16	19	0

KINSON.

For Surface Water Drainage and Forming and Kerbing New Footpath, for the Local Board. Mr. S. J. NEWMAN, Surveyor.

G. Troke, Winton	£146	6	11
H. C. Brixey, Newtown	128	15	4
W. A. Guy, Parkstone	123	8	10
G. T. Budden, Kinson	121	12	0
W. H. SAUNDERS & Co., Bournemouth (accepted)	118	18	0

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For additional Buildings at Infectious Hospital, Kingsthorpe, for the Northampton Corporation. Mr. W. D. GIBBINS, Borough Engineer. Quantities by the Engineer.		
J. Dunkley, Northampton	£3,261	0 0
G. F. Sharman, Northampton	3,129	11 4
W. J. Havell, Northampton	3,043	10 0
G. Branson & Son, Northampton	3,000	0 0
J. Chown, Kingsthorpe	2,885	0 0
E. Archer, Northampton	2,821	0 0
Green Bros, Northampton	2,778	0 0
J. Garratt, Northampton	2,753	0 0
A. P. Hawtin, Northampton	2,725	0 0
J. Woodford & Son, Northampton	2,685	0 0
G. FISHER, Northampton (accepted)	2,673	0 0
Engineer's estimate	2,667	0 0

LONDON.

For Paving the Carriageway of Park Street, N., with Wood, for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.		
Mowlem & Co., Westminster	£2,189	17 6
Improved Wood Pavement Company, E.C.	2,025	16 8
WM. GRIFFITHS, Kingsland (accepted)	1,935	8 4
For Paving with Compressed Asphalte the Carriageway of Thornhill Road, for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.		
Wm. Griffiths, Kingsland	£3,245	7 6
Val de Travers Asphalte Company, Old Broad Street	3,162	10 10
Limmer Asphalte Paving Company, Moorgate, Street	3,121	2 6
FRENCH ASPHALTE COMPANY, Laurence Pountney Hill (accepted)	3,063	9 2
For Paving a Portion of the Carriageway of the Holloway Road, N., by the Great Northern Hospital, with Wood, for the Vestry of St. Mary, Islington. Mr. J. PATTEN BARBER, Chief Surveyor.		
Mowlem & Co., Westminster	£618	14 6
Improved Wood Pavement Company, E.C.	598	6 2
WM. GRIFFITHS, Kingsland (accepted)	527	16 0

LONDON—continued.

For Repairs and General Decoration at the Offices of the Mutual Life Assurance Society, 39 King Street, Cheapside. Mr. LEDGER, Architect.		
Staines & Son	£570	0 0
P. Kerridge	485	0 0
Woodward & Co.	471	0 0
For Supplying and Fixing Laundry Fittings, Shafting, Steam Cooking Coppers and Hot-plate Carving Tables, at their Edmonton Workhouse, Upper Edmonton, for the Guardians of Edmonton Union.		
Bradford & Co, High Holborn	£680	10 0
T. Walker & Co, London	197	19 0
Roberts & Son, Lower Tottenham	160	6 8
H. Parsons & Harris, London	87	10 0

LYMINGTON.

For Erection of Two External Iron Staircases at the Workhouse.		
George & Harding, Bournemouth	£233	0 0
Jenkins & Son, Bournemouth	194	0 0
St. Pancras Ironwork Company	192	0 0
Drew & Co.	180	0 0
Allen & Son, Glasgow	178	5 0
Bacon & Curtis, Bournemouth	158	10 0
G. F. Saul, Lymington	142	0 0
Blackwall Ironwork Company	128	10 0
Architect's estimate, £100 for Three Staircases, and £66 10s. for Two.		

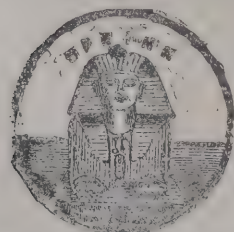
NORTHWICH.

For Construction of Midfeather in the Heywood Reservoir.		
S. Hutton, Bowdon	£1,061	0 0
Beckett & Co., Hartford	930	0 0
F. Wilson & Co, Northwich	865	0 0

PENYGELLI.

For Carrying out Uncompleted Work in Connection with Infants' School, Penygelli, for the Bersham United District School Board.		
J. Hughes, Wrexham Fechan	£1,577	0 0
W. E. Samuel, Wrexham	1,310	0 0
E. Bradshaw, Wrexham	1,296	0 0
S. Moss, Coedpoeth	1,263	0 0
W. Owen & R. Griffiths, Coedpoeth	1,250	0 0
Davies & Whittingham, Wrexham	1,200	0 0
W. OWEN, Wrexham (accepted)	1,120	0 0

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MERTHYR TYDFIL.

For Building Public Offices and County Courts for the Merthyr Tydfil Local Board. Mr. E. A. JOHNSON, Architect, Abergavenny.

In Stone.

E. Thomas, Neath	£14,487	0	0
T. Jenkins, Swansea	13,500	0	0
Bowers & Co., Hereford	13,225	0	0
T. Rees, Merthyr Vale	12,999	0	0
J. D. Williams, Knighton	12,450	0	0
W. Lissaman, jun., Chipping Campden	12,200	0	0
J. Linton, Newport	12,178	0	0
H. GIBBON, 185 Richmond Road, Cardiff (accepted)	11,400	0	0

In Brick.

E. Thomas	14,693	0	0
T. Jenkins	13,630	0	0
Bowers & Co.	12,910	0	0
T. Rees	12,899	0	0
J. D. Williams	12,575	0	0
J. Linton	12,361	0	0
W. Lissaman, jun.	12,250	0	0
H. Gibbon	11,668	0	0
Architect's estimate	11,960	0	0

SEDFIELD.

For Additions to Workhouse, Sedfield. Mr. H. T. GRADON, Architect, Durham.

W. C. ATKINSON, Stockton-on-Tees (accepted) £1,034 5 6

STRATTON ST. MARGARET.

For Re-roofing the South Aisle of the Parish Church, and Sundry Repairs. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

T. COLBORNE, Stratton Cross Roads (accepted).

SWINDON.

For Additions to Standish Villa, Bellevue, for Mr. J. P. Kirby. Mr. WILLIAM DREW, M.S.A., Architect.

W. CHAMBERS, New Swindon (accepted) . £250 0 0

For Rebuilding the Latrines and Sundry Works at the Haydon Schools, for the Rodborne Cheney School Board. Mr. WM. DREW, M.S.A., Architect to the Board, Swindon.

PARKER, Moredon (accepted).

SWINDON—continued.

For Enlargement of Even Swindon Schools, for the Swindon School Board. Mr. WILLIAM DREW, M.S.A., Architect, Swindon. Quantities by Architect.

	Mixed School.	Infant School.
T. Reeks, Lymington	£3,570 19 2	£1,239 12 6
W. Chambers, Swindon	2,949 18 0	1,017 10 6
W. Jones & Son, Gloucester	2,960 0 0	1,000 0 0
H. Flewelling, Wootton Bassett	2,873 0 0	973 0 0
G. Wiltshire, Swindon	2,840 0 0	950 0 0
T. Barrett, Swindon	2,815 2 7	950 17 10
C. Williams, New Swindon	2,707 0 0	937 0 0
T. COLBORNE, New Swindon *	2,592 8 6	916 1 4

Architect's estimate, 3,910l.

* Accepted subject to the approval of the Education Department.

For Erection of two Dwelling-houses and Shops, Regent Street, New Swindon, for Mr. G. Whitehead. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

J. COLBORNE, New Swindon and Stratton Cross Roads (accepted) £652 10 0

VARIETIES.

WE are requested to announce that the partnership existing between Messrs. R. J. Collier & Henderson has been dissolved. Mr. H. A. Henderson, F.S.I., is carrying on his business as an auctioneer, surveyor and land and estate agent, at 70 Finsbury Pavement, London, E.C., and under his own name only.

THE first piece of turf for the East Glamorgan Railway, a line to connect Barry Dock with the Ogmore Valley, has been cut. The new line will give a direct connection between the coal-fields of the Ogmore Valley and Barry Dock.

IT is stated that Mr. W. Cuthbert Quilter, M.P., has had a steam ferry bridge constructed for the river Doben, Suffolk, near his residence, Bawdsey Manor. The bridge will be a very great convenience to the people of Felixstowe and Woodbridge districts, vehicular communication having hitherto been very difficult. The bridge is constructed of Siemens steel, and is divided into six watertight compartments. It is propelled by



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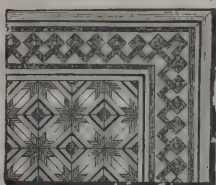
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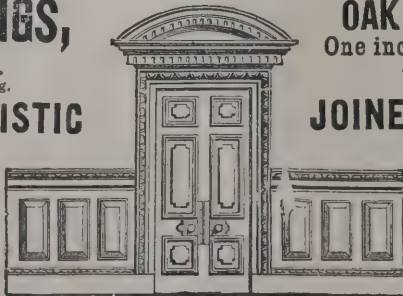
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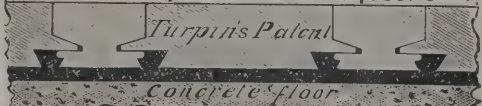
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means of chains passing over two segment wheels, motion being given to the segment wheels by a pair of surface condensing engines worked by a return tube boiler. The roadway of the bridge is 12 feet wide and 50 feet long.

THE correspondent of the *Standard* at Vienna says that the Turkish Ministry of Public Works has determined upon the reconstruction of the ancient water conduits of Jerusalem, dating from the age of King Solomon. By this means it would be possible to convey 2,500 cubic metres of water daily to the Holy City. Of this it is proposed to give 1,000 metres away free of charge to the poor of Jerusalem, the distribution to take place at the mosque of Omar, the Holy Sepulchre and other places frequented by pilgrims. The new conduits are to be joined to the ancient aqueducts of Aroba, and are to be carried through a tunnel 3,570 metres in length. The total outlay in connection with these works is estimated at 2,000,000 francs.

THE application of the Bath Town Council for powers to borrow 30,000*l.* for certain improvements to the Grand Pump Room, Bath, has just been heard. Mr. Austin King, who appeared for the Corporation, said that the proposed extension included the provision of another concert-room, a coffee-room and ladies' parlour, with other improvements, to make a pleasant lounge. Large sums of money, he said, had been expended in building new baths lately, and the bathing establishment was now very complete.

THE Worcester City Council propose to borrow 850*l.* to purchase a site on which to erect a new isolation hospital for infectious diseases.

SCARBOROUGH CORPORATION propose to borrow 70,000*l.* for the construction of a new marine drive and sea wall round the Castle Hill.

THE Town Council at Southend-on-Sea have applied to the Local Government Board for permission to borrow 25,000*l.* for works of sewerage and sewage disposal, 4,200*l.* for the erection of municipal buildings, and 400*l.* for the construction of underground conveniences.

THE final meeting of shareholders of the Accrington Gas and Waterworks Company, whose extensive undertaking has been sold to the Corporation and four local boards surrounding, has just been held. In addition to declaring the customary dividends of 10 and 8 per cent., the meeting decided to distribute undivided profits amongst the shareholders equal to the

extra dividend of 10 and 8 per cent. on A and B stock. There is a remaining sum of 5,000*l.* received from local authorities as compensation, and a committee was appointed to confer with the directors as to how the money should be divided.

AT Glasgow some interesting experiments are being made in the relaying of Buchanan Street. For many years wood has been the pavement used for this thoroughfare, and in order to test the particular timber best suited for the traffic, four different kinds of wood are now being used in the relaying of the street. These are Jarrahdale, Karri wood, Kauri pine and carbolised pitch-pine. In addition to these, however, a new cork pavement is also to be experimented with. Some time ago brick paving was tried, but given up as a failure.

THE *Liverpool Courier* says:—The preparations for the forthcoming Autumn Exhibition of pictures at the Walker Art Gallery are making rapid progress, and those who are in a position to know confidently express the opinion that the show will be one of the best in recent years. The Artists' Club dinner to the gentlemen engaged in selecting and hanging the pictures has been arranged for the evening of Tuesday, 28th inst., and the Corporation banquet will take place on the 30th.

AT the meeting of the proprietors of the Liverpool Gas Company it was reported that the year's working showed a surplus of 107,790*l.* The coal strike had entailed a large increase in the expenditure upon coal. In view, however, of their present coal contracts, the directors felt justified in reducing the price of gas from 3*s.* 4*d.* to 3*s.* per 1,000 cubic feet.

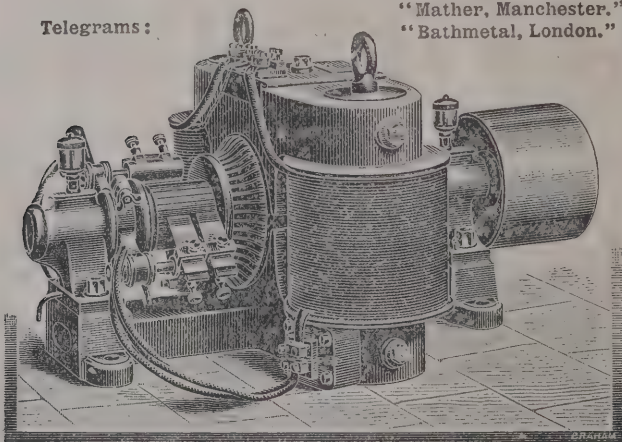
AT the meeting of the Edinburgh Dean of Guild Court a warrant was granted for the construction of a bridge across the Water of Leith at Bell Place, Glenogle Road.

THE Tunstall Local Board of Health propose to borrow 1,500*l.* for the extension of the technical schools. The additions contemplated are estimated to cost 2,300*l.*

THE *Birmingham Post* says:—It was intended to solicit from American visitors donations for a new east window for Stratford-on-Avon parish church, the cost being estimated at 600*l.* A wealthy English gentleman, Mr. William Law, of Littleborough, near Manchester, has now come forward and offered to present to the church an English window in place of the one proposed, and it is believed that his offer will be accepted.

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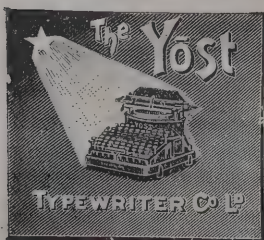
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TRADE NOTES.

A NEW large turret Cambridge full four-quarter chime clock, with five large bells and four automaton figures taken from Sir Walter Scott's "Ivanhoe," and representing King Richard, Friar Tuck, Robin Hood, and Gurth the Swine Herd, has been fixed in the new Arcade, Oldham, Lancs., just erected for Mr. J. Hilton, wholesale clothier, of Curzon Street, Oldham, by Messrs. Wild, Collins & Wild, architects, of Clegg Street, Oldham. The arcade connects two of the principal streets of this busy town, and at one of the entrances is placed a large 6-foot illuminated dial with ornamental corners designed by the architect. The clock is from the firm of Messrs. W. Potts & Sons, 13 Guildford Street, Leeds, and 22 Collingwood Street, Newcastle-on-Tyne, who are well known for this class of work, and they have introduced all the latest improvements of Lord Grimthorpe, the greatest authority on clocks and bells. Besides being an attraction, it will also be very useful as a good time-keeper.

WE are informed by Messrs. W. F. Dennis & Co., of Billiter Street, E.C., that they have been appointed sole agents in Great Britain and Ireland for the Antwerp Telephone and Electrical Works (Société Anonyme), Antwerp, manufacturers of telephones and other electrical appliances, which they have for some years past made a specialty of, for the English market (home and export).

ELECTRICAL.

WE notice that the Edison and Swan United Electric Light Company, Limited, are removing their head offices from 100 Victoria Street, S.W., to new premises, the Ediswan Buildings, 5 and 37 Queen Street, Cannon Street, E.C., where they will carry on business on and after August 27.

AT Worcester the mayor, Mr. G. H. Williamson, will open the new electric-light works on October 11.

AT Wolverhampton the Corporation scheme for illuminating central area of Wolverhampton with the electric light is nearing completion, the lines having been laid beneath the footways, and the generating station will be finished shortly. The principal Corporation buildings which will be lighted on

the new principle will be the Town Hall, Market Hall, Free Library, Art Gallery and School of Art, and out of the twenty-two competitors Messrs. Fletcher & Hurst, of Burnley, have secured the contract for putting the necessary wires and the selected fittings into those buildings. The amount of the tender, which was the lowest, was 609*l.* 11*s.* The tender for the pendants and other fittings has not yet been agreed upon.

THE *Irish Times* says:—It will be recollected that last year the Bill promoted by the Dublin Southern Tramways Company for applying electricity to the working of their cars on the overhead system between Haddington Road, Kingstown and Dalkey received the Royal assent. Since then the company, who have their headquarters in Bristol, have been making the necessary arrangements for commencing operations, and we understand that these have been so far advanced that the contracts for the electric installation have actually been placed.

GREAT improvements are being effected at Arundel Castle for the Duke of Norfolk. The work of rebuilding the castle is steadily proceeding, and the new road and bridge are rapidly approaching completion. When the electric light installation is completed, it will be one of the most important private installations in the kingdom. The building connected with the electric lighting and general arrangements of the plant have been carried out according to the designs of Mr. A. F. Phillips, C.E., of St. Albans, and of 31 Great George Street, Westminster. A fire-reserve has also been constructed under the designs of Mr. A. F. Phillips, embodying all the principles which Sir E. M. Shaw thought advisable.

HYDRAULIC POWER SUPPLY IN SYDNEY.*

I PROPOSE to consider briefly in the first place the remarkable progress and development that has been made in hydraulic power supply on the co-operative system during the last few years. The first meeting of this Association at which I had the honour of being present was in September 1889, on the occasion of Mr. Selfe's very able paper on "The Operation of Power Companies and Power Transmission by Compressed

* A paper read before the Engineering Association of New South Wales by Mr. Tom Dickinson, and published in the *Building and Engineering Journal*, Australia.

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Air." On that occasion the system of power transmission by compressed air had a worthy champion in Mr. Selfe. At a later stage I may have to refer to statements then made in reference to the cost of hydraulic power supply in Sydney. Public power supply on the high-pressure hydraulic system was successfully established in Hull in 1875, on a comparatively small scale, the installation consisting of two pairs of pumping engines of 60 horse-power each, two Lancashire boilers 22 feet 6 inches by 6 feet 6 inches diameter, one accumulator with 18 inch ram by 20 feet stroke, with storage and filtering tanks complete. Additions have since been made adding to the output capacity of this station. The works have been in continuous and successful operation up to the present time. Then we have the London Company inaugurated in 1882, with works in operation in 1884, delivering 218,000 gallons per week, to 96 machines. In the London Company's report for the year ending December 31, 1893, we have the enormous development in their operations represented by a total output of over 7,000,000 gallons per week, supplied to work a total of 2,025 machines, producing a revenue of 51,445 $\frac{1}{2}$ per annum. Liverpool was the next city to adopt the system in 1886, Melbourne in 1888, Sydney in 1890. The Birmingham Corporation recently commenced to supply power on their own account; works have also been erected in Manchester and Glasgow by the respective corporations. The Melbourne Company commenced to supply power in July 1889, with about 12 machines connected. Now they are supplying power to 413 machines consuming 1,500,000 gallons per week, with a total length of 18 miles of mains in use. The Sydney Hydraulic Power Company commenced to supply power in January 1891 to 8 machines, and now they are supplying power to over 200 machines. The steady growth in the company's operations and its appreciation by the public is evidenced by the following particulars:—Water delivered to mains—December 1891, 240,000 gallons per week; December 1892, 570,000 gallons per week; December 1893, 721,000 gallons per week. The output at date is 740,000 gallons per week, showing a continued steady increase.

The company's central pumping station, situated in Pier Street, Darling Harbour, is a building containing engine-room, boiler-house, accumulator tower, coal store and commodious yard space for the storage of pipes, &c. The engine-house contains three sets of high-pressure expansive steam-pumping engines of "Armstrong's" horizontal type. Two pairs of the engines have steam cylinders 24 inches diameter by 30-inch stroke, and one pair

with cylinders 16 inches diameter by 24-inch stroke. At a working pressure of 100 lbs. per square inch at the boilers, each pair of the large engines is capable of delivering 475 gallons per minute from the pump at a pressure of 750 lbs. per square inch when running at 50 revolutions per minute. The smaller set of engines, 16-inch by 24-inch stroke, is equal to delivering 200 gallons per minute under the same conditions when running at 60 revolutions per minute, the piston speed being 250 and 240 feet per minute respectively, the three engines being equal to a total output of 1,200 gallons per minute. Each set of engines is complete in itself, with two high-pressure steam cylinders and two double-acting force-pumps fixed on a massive cast-iron bed-plate. The cranks are shrunk and keyed on to a shaft common to both sides of the engine; the flywheels for the 24-inch cylinder engines are 11 feet in diameter, weighing each 95 cwt., and for the 16-inch cylinder engine 9 feet diameter, and weighs 70 cwt. The steam cylinders have a main slide and also expansion slide working on the back of same, arranged to cut off at any point between three-tenths of the piston-stroke and the cut-off of the main valve. The expansion-valves are capable of being adjusted while the engines are running. The force-pump cylinders of the 24-inch cylinder-engines are 7 $\frac{1}{2}$ inches diameter, and fitted with solid gunmetal rams 7 $\frac{1}{2}$ inches diameter in piston part and 5 $\frac{5}{8}$ inches in body part; for the 16-inch engines the rams are 5 $\frac{1}{4}$ inches diameter in piston and 3 $\frac{3}{4}$ inches diameter in body part. The suction-valves are 7 inches diameter and the retention-valves 6 inches diameter for the 24-inch engines and 5 inches and 4 inches respectively for the smaller set of engines. The water delivered from the main pumps passes into the accumulators. The rams are 20 inches in diameter and have a stroke of 22 feet; they are each loaded with 100 tons of ballast (Nepean gravel) contained in a wrought-iron cylindrical casing suspended from a crosshead on the top of ram. The area of each ram is 314 square inches, and the pressure being 750 lbs. on the square inch, the total load is 235,500 lbs., or nearly 105 tons, the extra 5 tons being supplied by the weight of ram and casing. One of the accumulators is loaded a little heavier than the other, so that they rise successively, the more heavily weighted, being the controlling accumulator, actuates a throttle valve on the main steam pipes. If the engines supply more water than is wanted the lighter of the two rams first rises as far as it can go, the other ram then rises, and when it has reached nearly the limit of its stroke, shuts off the steam and slows down, or stops the engines automatically; although one accumulator is always in

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advance of the other the difference of load is so small that both move at the same time ; the result is that the pressure is maintained in the mains with very great regularity. In the arrangement of the steam, feed and hydraulic pipes at the works a thorough system of duplication has been carried out. From the boilers to the pumping engines two distinct lines of steam pipes are provided, so that any boiler can be isolated for examination or repairs, and any section of the system of steam pipes can be closed if necessary for remaking joints or other repairs without any inconvenience whatever ; the same system of duplication has been carried out in the arrangement of feed pipes. The pressure pipes from the pumps to accumulators have been arranged in a similar manner ; two separate pipes are provided with stop-valves arranged so that any engine can be shut off without any interruption to the supply ; should a pressure pipe break the section can be isolated at once, the water being sent through the duplicate main, and repairs effected without stoppage. This matter of duplication has been carefully planned and carried out in order to minimise the risk of interruption of supply, a most important consideration where hundreds of elevators and hoists rely on one source for their motive power.

(To be continued.)

NEW CATALOGUES.

HOBBS, HART & CO., Limited, have issued a new edition of the safe and strong room door section of their illustrated price list. It contains the information which is required on the subject in the most precise form. With a firm of the kind the briefest statement is sufficient, for their works are a better recommendation than can be given by words. There are accurate drawings of the various classes of safes and safe doors which are being manufactured by the firm and corresponding to those which have gained a reputation for them. That their productions have been employed for the royal gold and silver plate-rooms and jewel-room in the Bank of England and in many of the most important banks of London and the provinces, is the best testimony to the value of the construction as an unconquerable protection. The examples, which are illustrated, speak well for the skill and energy of the present management, and we have no doubt the very large outlay will have an adequate return. The list of safes and doors is to be followed by a revised lock list.

ILLUSTRATIONS.

DECORATIVE PANELS.

RESIDENCE, WESTFIELD ROAD, EDGBASTON.

LONDON AND PROVINCIAL BANK, NEATH.

NEW SCHOOL, BATHGATE.

ORNAMENTATION IN GLASS.

MESSRS. JONES & FIRMAN have recently revived the old-fashioned "brilliant" cutting, but their latest and most highly decorative form of ornamentation is what is known as the French or shaded embossing.

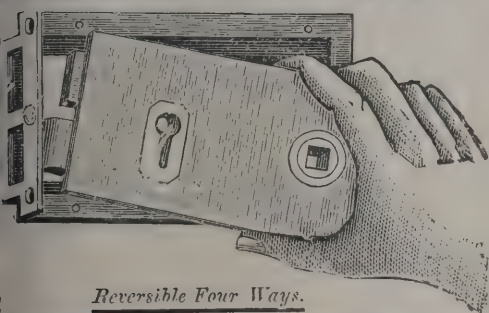
Quite lately we visited the works of Messrs. Jones and Firmin, Blackfriars Road, London, and saw some very rich panels produced by this new process, which will prove a favourite method of decoration for some time, as it is soft and delicate in tone, light in appearance, and in the hands of experienced manufacturers, such as the firm in question, is capable of producing most beautiful effects. We also saw some glass tablets for wall decoration, the subject being painted on the back of the glass before the silvering is done. This has a far better effect than painting on the face of the glass, and it is stated that mirrors made in this style can be produced at a less cost than tiles.

There are few industries in which so many changes and improvements have been effected as those which deal with the utilisation of glass for decorative purposes and for advertising.

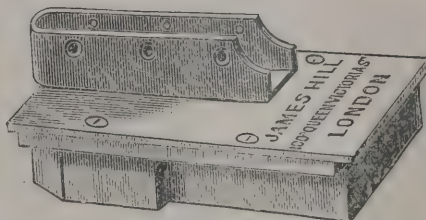
BURSTING OF WATER-MAINS.

CONSIDERABLE commotion and damage was occasioned in Birmingham by the bursting of water-mains in three districts. Water was seen issuing from the roadway at the junction of Liverpool Road and High Street, and the volume increased rapidly until it attained sufficient force to tear up the macadam and the concrete bed and stone setting of the tramway, traffic upon which had to be suspended. Information of the occurrence was telephoned to the officials of the Staffordshire Potteries Waterworks Company, but before the water could be turned off at the reservoir Liverpool Road was flooded for a distance of 500 yards, and the cellars of the houses for at least

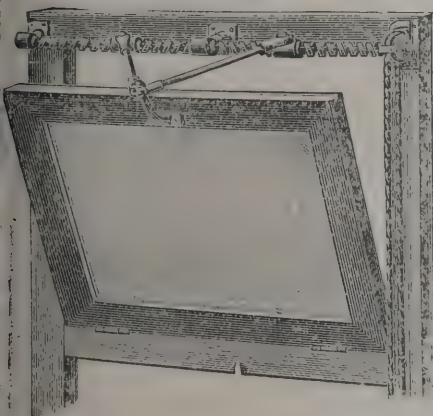
HILL'S PATENT LOCKS & OTHER FITTINGS.



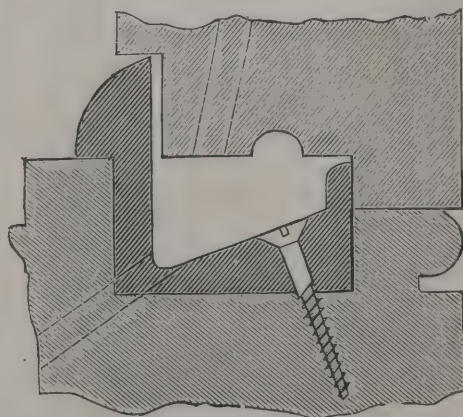
Reversible Four Ways.



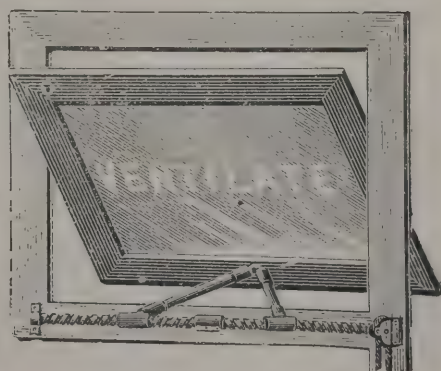
All kinds of Rim and Mortise Locks, Door Furniture, Sash and Casement Fittings, Swing Hinges, &c., kept in Stock.



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a hundred yards on each side of the breakage were completely filled with water. The manual engine of the Stoke fire brigade was made use of for the purpose of pumping the water from the cellars, and men were at work throughout the night and next morning in replacing the fractured main pipe and restoring the roadway and tramway. Some time after the burst in Liverpool Road there was another break in the main at the top of the Honeywall, Penkhull, and the flood of water issuing from the opening flowed down the hill with such force as to cut up the roadway and cause much damage to the pavement and channelling in several places. There was also an extensive bursting of the main at Trent Vale, where it passes over the bridge spanning the Newcastle branch of the Trent and Mersey Canal. Torrents of water swept down the road in the direction of Trentham for several hundred yards, and accumulating in a hollow at the foot of the incline caused a flood several feet deep, and rendered the road impassable for some time. The main to which these accidents occurred is a comparatively new one, and carries water from the company's new works at Hatton to the Potteries. It is understood that the company have ordered an investigation to be made as to the cause of the breakages.

BELGIAN v. ENGLISH IRON JOISTS.

When addressing a meeting at Brooklands, Mr. Thomas Morris, of the Pearson and Knowles Iron Company, Warrington, referred to his recent investigations into the condition of the Belgian iron trade. He said that he had recently made a journey to Belgium to ascertain on the spot how it was they could make so cheaply this building and construction material which was imported so largely into this country for building purposes. When he told them that in the Law Courts, London, there were used 11,000 tons of Belgian iron, and in the Hôtel Métropole 10,000 tons, they would have some idea, applying it to the whole of England, of the enormous quantity of iron that came from Belgium. It had frequently puzzled him how they could beat us on our own ground, and he determined to ascertain the reason. He fortunately met in Antwerp a gentleman who was agent for a Sheffield firm, who kindly volunteered to show him all that could be seen and give him every information possible. He ascertained that the price of the pig-iron at the works before it was made into those sections which architects were so fond of putting into our large buildings was 35 francs,

but that the Belgians had put a duty of 6 francs on French pig-iron. The Belgians cried out because the French were sending pig-iron into Belgium. In addition there were 6 francs per ton carriage, in all 50 francs, or 2½ per ton. He (the speaker) said they got pig-iron in England as cheap as that, and thought it might be in the lower price of coal. The price, however, was as much as with us, and the price paid for puddling was the same. When he got to the works he found that the puddlers who started with this pig-iron were working for a quarter the price we were paying in England to-day, and so on through every department it was a third or fourth less. These men worked almost continuously for miserable wages. They knew nothing of a Sabbath or seventh day. In England the trades union leaders were crying out for an eight hours' day, and while he did not desire that in England they should work longer than they did, some effort ought to be made whereby these men should have one day in seven and something akin to the hours they had here. If they could not afford to pay more wages then they need not do it, but cut off those long hours, compel English railway companies to carry merchandise at the same rate as they did in Belgium, and he did not think we should see one ton of building sections in England where now they saw thousands. He thought the trades union leaders and our working men should move to obtain shorter hours on the Continent, and then with fair rates of carriage and fair competition there would be more work and people would be happier all round. At the same time he wished it to be known in Belgium that what he saw there was sufficient to shame any man of common sense or any man who had capital to spend where labour was employed.

A MANX ELECTRIC TRAMWAY.

An electric tramway constructed by the Isle of Man Electric Tramway Company (Limited), and running between Douglas and Laxey, has been formally opened from end to end. It was completed and opened as far as Groudle Glen, half the full distance, last summer. The traffic, especially since the whole of the line has been opened, is very large, far exceeding the expectations of the promoters, as it affords a very pleasant excursion for the many summer visitors to the island. The tramroad is seven miles in length, with a double line all the distance. It is a surface line, following, for the most part, the contours of the hilly country through which it passes, but at



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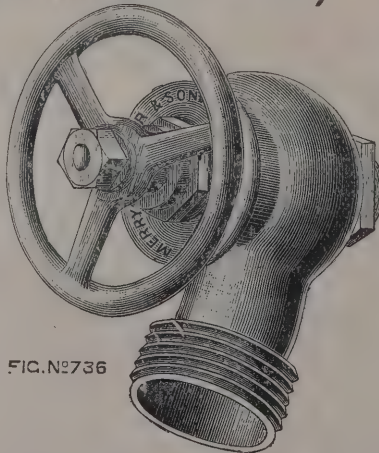
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GOLD MEDAL, Inventions Exhibition, 1885.

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the Douglas end there is a cutting along the face of the cliff, this portion of the road being protected seaward by a massive cement-concreted wall. At other portions of the line there are some long gradients, the steepest being 1 in 24. The line is made of the ordinary steel rails laid on transverse sleepers. The speed is, by Act of Tynwald (the Manx Parliament), limited to eight miles an hour. The cost of the line, including the plant, rolling-stock and electrical machinery, is about 9,000*l.* a mile. Each train consists of one motor and one trailing car, the two vehicles being together capable of seating eighty-two persons. The electric current is generated at two stations—one at Douglas and the other at the Laxey terminus. At the Douglas end there are three steam-engines and three boilers, each engine driving a fifty kilowatt dynamo of the Manchester type. There is also a large fixed accumulator storage station about halfway along the line. The current generated by the dynamos is conveyed by copper conductors supported by steel poles erected along the line. Two uprights fixed on each motor car carry a horizontal copper collecting bar, which conveys the current from the conductors to two 30 horse-power motors fixed underneath each car. These motors are geared to the axle of the driving rails. The return current passes through the rails, which are connected by a copper strip at each joint. The whole of the electrical plant and machinery has been designed by Dr. E. Hopkinson, the contractors for the work being Messrs. Mather & Platt, of the Salford Iron Works, and the engineer by whom the tramroad was constructed Mr. Frederick Saunderson, of Douglas. The line has been inspected by Colonel Rich and Major Cardew, the Government inspectors, who passed over in a trial car, and who expressed their entire satisfaction with it in every respect.

THE CHANCELOT FLOUR MILLS, EDINBURGH.

THE pile of buildings erected by the Scottish Co-operative Wholesale Society, Limited, at the northern boundary of Edinburgh has been opened. The buildings are to be known as the Chancelot Roller Flour Mills. It appears, says the *Scotsman*, that the distributive co-operative societies federated with the Wholesale Society purchase about 180,000 bags of home millers' flour each year; and in these circumstances the directors in 1891 resolved to add flour milling to their already numerous branches of manufacturing industry.

Ground at Chancelot, extending to over two acres, was taken from Colonel Clark Rattray, and the memorial-stone was laid by Mr. W. Maxwell, the president, on August 6, 1892. The progress of the building has been watched with considerable interest by thousands who have no monetary stake in it. The Chancelot Mills now form one of the most conspicuous objects on the northern boundary of the city looking towards Leith; and it is a circumstance on which the directors deserve to be congratulated, that they have not only seen to it that the mills are stoutly built and efficient for their work, but that they have been enlightened enough to permit their architect to impart to the front elevation a distinctly ornamental architectural character. With their imposing mass, prominent clock tower and other decorative features, the mills are among the most important industrial buildings that have been erected in Edinburgh for many years.

The pile has been built and equipped after a careful inspection and consideration of the most modern flour mills in England and Scotland. The frontage to Dalmeny Road has a length of 328 feet. It is of Classic design, boldly planned, the line being broken up by four bays effectively pilastered and showing other simple forms of Classic ornament. These bays are surmounted by domical roofs crowned by iron crests. The central tower, 42 feet square at the base, rises to a height of 185 feet. It shows at the angles clusters of pilasters and pinnacles; the four clock faces are placed in a series of moulded dormers surmounted by a sheaf of wheat, and crowning all is the high-pitched conical roof terminating in a platform surrounded by a massive iron crest, into which are worked the monogram of the Society and the Scottish thistle. A capital feature of the elevation is an open balustrade, which is carried right round the wall-head of the mill save where the bays and towers intervene, and a similar balustrade adorns the wall-head of the plainer warehouse block behind. Immediately to the east of the tower the engine-house is projected beyond the line of the general building. This, with rustic ashlar-work similar to the base of the whole mill, circular-headed windows, moulded cornice and balustrade, is also an effective part of the design. The whole of the buildings are built of stone; the walls are 2 feet 6 inches thick at the base, and internally are plastered with Portland cement and Keene's cement, which give to them a hard white surface.

The mill has in the meantime been fitted up with plant capable of turning out 25 sacks per hour, and there is provision for increasing the output by other 15 sacks with the same

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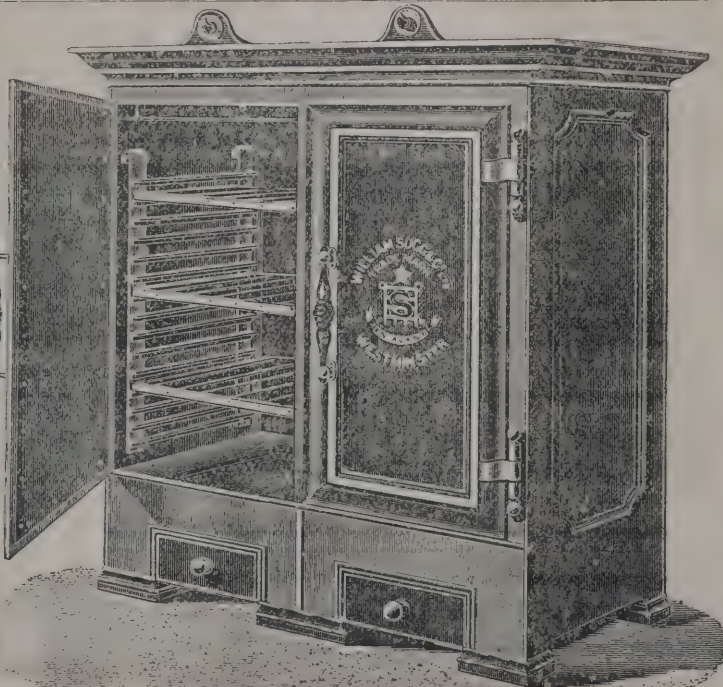
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engine power. The working week for the machinery will be one of 144 hours, engines and machinery going night and day except on Sundays. The mill is entirely fitted up with Symon's roller plant, which in their report to their constituents the deputation which visited other mills say had been recommended to them as a modern and efficient system. Mechanically it seems exceedingly perfect, for so complete is the mechanism for receiving, lifting, cleaning, storing and distributing the wheat, and milling, separating and sacking the flour, that it seems something like forty men only will be required to keep the whole mill running. Looking at the buildings from Dalmeny Road, that portion to the east of the tower is the mill proper: in the tower are situated the wheat cleaners; to the west of the tower is the silo-house; and in the westmost bay a number of workshops of various kinds chiefly associated with the repairing of sacks, &c. This front building is of five storeys, and is 65 feet in height to the wall-head. The different floors vary from 14 feet 6 inches to 12 feet 6 inches in height. To the north of the mill, and separated from it by a courtyard 40 feet in width, is a large range of warehouses, six storeys in height, and to the north of the silo-house are workshops for mechanics, the boiler-house and chimney stack, which rises in shape like a Doric column with ornamental gilled top to a height of 215 feet. Beyond that is the North British siding, and on ground on the north side of the railway, over which is thrown an iron bridge, is a range of stables and cart sheds. The Caledonian Railway has acquired ground to the east of the mill, in connection with their new Leith line, and they will form a siding in the court between the mill and the warehouses, so that there will be ample railway facilities for receiving grain and sending away the manufactured flour. A few notes may be given to show how complete in all respects are the labour-saving appliances at this mill. The wheat coming by railway is poured from the waggon into a tip, and carried along a subway on an endless belt to a hopper in the basement of the tower. The belt can deal with 50 tons an hour. From the hopper the wheat is raised by elevators to the top of the tower, where it is roughly brushed by machinery and distributed, by means of spouts and travelling-bands, into a series of fifty-four wooden silos, each 8 feet square and about 60 feet in depth, where it is stored. The silos have hopper bottoms, and when the mill is running these discharge the wheat by spouts upon moving bands and screws, which carry it to the cleaners in the tower, whence it passes to the mill and goes through on the several floors all the various processes of rolling

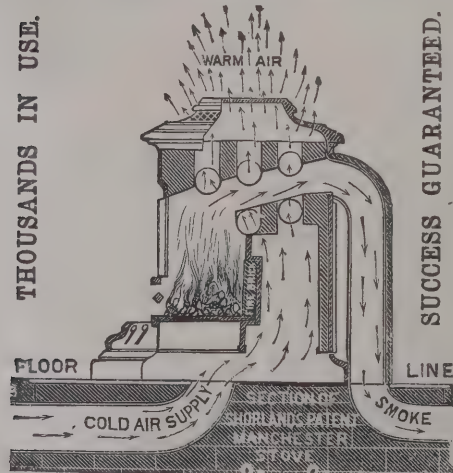
and milling. The flour is carried across an iron gangway connecting the mill and the warehouse on travelling bands, and is mechanically sacked and pressed by an ingenious American contrivance. Not a hand touches it from the moment the wheat passes into the mill until it is sent out sacked and ready for use. At different stages the wheat and flour are automatically weighed, so that the quantities of grain used and flour delivered can be precisely ascertained; and at one point the flour passes through a machine with magnets, whose object is to attract any metallic particles which accidentally may have gone along with it. In the warehouse, each floor of which is carried on seventy-two cast-iron beams, there is storage for 45,000 to 50,000 sacks. Approved tackle-lifts for delivering the sacks either into the railway waggons or into carts are placed all round this part of the building. The main cart entrance is in the basement of the tower.

The engine-house, situated as already stated on the east of the tower, is 61 feet by 55 feet by 27 feet in height, and the taste seen outside is also exhibited in the decoration of this apartment, as the only one in the mill suitable for such treatment. The deep spaces of the iron girders carrying the floor above have been effectively dealt with, and form for the engine-house a beautifully panelled ceiling done in cordelova; there are a series of iron-supporting pillars with Corinthian capitals; the walls are pilastered at various points; there is a decorative cornice and a handsome dado, the latter in cordelova, with raised wheatsheaf and floral devices. The floor is laid with black and white tiles, and the windows are filled with stained-glass figures associated with the agricultural industry.

The engines, which are of a powerful description, were constructed by D. Stewart & Co., Limited, Glasgow. They are of the triple-expansion, horizontal, tandem, Corliss, condensing type. They have one high-pressure cylinder 15 inches in diameter, one intermediate cylinder 24 inches in diameter, and two low-pressure cylinders 28 inches in diameter, each cylinder having a 4-foot stroke. Power is transmitted by a rope pulley 20 feet in diameter, grooved for eighteen $1\frac{3}{4}$ -inch ropes. The engines can develop 600 horse-power, with a consumption of 11 lbs. of steam per horse-power per hour. In the same engine-room is a small compound engine of similar construction for driving the dynamos of the electric light installation, the shaft being so arranged that the mill engine may be called into requisition for this purpose if it should be required. Steam is supplied by two horizontal boilers 8 feet in diameter by 30 feet in length, constructed by Messrs. Penman & Co.,

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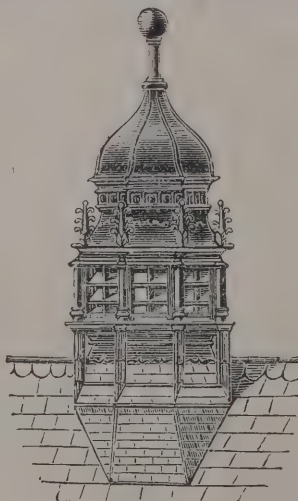
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"THE GOLD MEDAL RANGE,"

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WORKS, ROTHERHAM. Estab. 1854.

Glasgow. They work up to a pressure of 160 lbs. per square inch. The feed water is heated by means of a fuel economiser, and the condensing water will circulate between the boilers and a series of large brick-built cooling ponds placed at the west end of the grounds.

The dynamos are two compound self-regulators of 30 units each, made by Mavor & Coulson, Glasgow, and fitted with Sayer's patent non-sparking armature. Each machine is capable of lighting up the whole mill, the installation of which consists of 500 incandescent lamps of 16 candle-power and eight outdoor arc lamps. The wiring throughout the mill is on the concentric wire system. All the branch circuits are of a uniform sectional area, distributing from a single fuse box in each section. The main distributing circuit is led from the switch-board to these fuse boxes, thereby reducing the chance of faults to a minimum, as there are no joints off the main cables. The switch-board is set between the two dynamos, and has twenty-four branch switches for the various circuits.

The arrangements for guarding against and dealing with outbreaks of fire are of a complete description. The rope-race immediately to the east of the tower forms a fireproof buffer-chamber 7 feet 6 inches across between the mill and the tower; while the tower itself constitutes a similar fireproof block against fire from the silo-house. In one of the floors of the mill there is an ingenious cyclonic machine for gathering from the spouts the fine flour dust by which explosions are often caused; and in addition to a wide distribution of fire hydrants and a fireproof stone stair placed in the tower which forms an architectural feature at the back of the buildings, the mill has been fitted with Grinnell's automatic sprinkler, which consists of a large series of pipes with 770 sprinklers closed with solder. If fire should occur the solder melts whenever the temperature is raised to 155 deg. Fahrenheit and the water pours through the sprinklers upon the flames. For sprinkler and hydrant purposes there is a large tank on the top of the tower capable of containing 30,000 gallons of water. Great pressure is thus got on the fire apparatus.

The total cost of this fine pile of buildings and their equipment will be about 100,000l. The designs were by the late Mr. James Simpson, burgh assessor and architect, Leith, and since his death the work has been carried out by his son, Mr. George Simpson, who also succeeded his father in his civic appointment. The whole of the masonry was built without the intervention of contractors, and on an average between 200 and 300 masons and labourers were employed upon it.

FORESTRY IN GREAT BRITAIN.

AN address was delivered at the opening of the Biological Section at the meeting of the British Association at Oxford by Professor Bayley Balfour on "Forestry." He said he had followed the lead of those of his predecessors in this chair, who had used the opportunity to discuss a practical subject. Forestry was a branch of applied science, to which in this country but little attention had been given by any class of the community. By scientific men it had practically been ignored. Yet it was a division of rural economy which ought to be the basis of a large national industry. There were no intrinsic circumstances in the country to prevent their growing trees as a profitable crop for timber as well as their neighbours. Nowhere in the world, probably, were to be found finer specimens of tree growth. But the growing of trees for effect and in plantations was a very different matter from their cultivation on scientific principles for the purpose of yielding profitable crops. It was the latter aspect—the sylvicultural aspect—in the science of forestry which had hitherto been neglected in this country. There were two aspects from which forests were of importance to a country—firstly, as a source of timber and fuel, and secondly, on account of their hygienic and climatic influences. Dealing more particularly with the former aspect, the Professor remarked that while there were no means available through which to estimate the annual output of timber from their plantations, indirectly they could gauge the insufficiency of their woodlands to supply the timber necessities of the country by reference to the returns showing the amount and value of forest produce annually imported. This had been steadily increasing, until in 1893 its value exceeded eighteen millions sterling. No one, of course, would suggest that in the limited and densely-populated area of Great Britain timber trees of kinds suiting the climate could be grown sufficient to supply all their demands. But few would venture to deny that they could do very much better for themselves than they did, and that their labour payments abroad might be materially reduced. It was admitted that well-grown home timber was, of its kind, equal to, if not superior in quality to that which was imported. It was surely then legitimate to expect that a large supply of well-grown timber would enable them to hold the market to a much larger extent than was at present the case, and that they might be very much less dependent than they were upon the surplus timber of other nations. The Professor went on to show that the importance of this was increased by

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the fact that there was abundant evidence forthcoming to indicate that the present rate of timber consumption of the world was in excess of the present reproduction in the forests of the great timber-supplying countries, and that with the persistence of existing conditions they would appear to be within measurable distance of a timber famine. The acreage of wooded land in Great Britain and Ireland was only 4 per cent. of its total area—a smaller proportion so covered than any other European country. Denmark had 5 per cent., France 15, Norway and Germany 25, Austria-Hungary 30, whilst in Sweden the amount was over 40 per cent. But although there was so little land under wood in Britain and Ireland, there were thousands of acres unsuited for any other crop, and these it was desirable to have planted. How to have this accomplished and how to secure that woodlands already existing should be tended so as to produce a maximum result giving a profitable return were the problems they wished to see solved. Dealing with certain practical difficulties in the way of an extension of planting, Professor Balfour remarked that forestry was handicapped as compared with agriculture, by the fact that the crop could not be reaped within the year. It was this planting for posterity that made demands upon the landowner to which he was unequal. But in this connection the Professor argued that, scientifically worked, a forest area on suitable land, of which there was such abundance in Britain, should be capable of yielding an annual net revenue as regular as that obtainable by any other form of soil cultivation. The latter and larger half of Professor Balfour's address was devoted to the consideration of practical suggestions for bringing forestry in Britain more in line with that of other nations. The State, he said, ought to treat the forest areas now in its possession in a reasonable and scientific manner, instead of leaving them as objects for the finger of scientific scorn. The creation of some experimental teaching stations in State forests was one of the essentials for forestry in Britain. He would go further, and say that the area of State ownership should be increased to the extent of the establishment of forestry stations of an acreage sufficient to allow of a satisfactory rotation—for instance, in the North of England and in Scotland. There had been, as they were aware, proposals for the afforestation of some of the three million and more acres of waste land in the Highlands of Scotland capable of growing timber, and they awaited with some interest the report of the Deer Forest Commission which had taken evidence on the subject. If, as had been suggested might be

possible, afforestation was attempted through any system of State-aided planting, an opportunity would be afforded for securing what would be of much advantage to the country. Remarking that it was through education alone that they could arrive at improved forestry, Professor Balfour discussed the scanty provisions already made in the country for imparting teaching in silviculture, and made suggestions as to how that could be extended and improved, especially by the co-operation of the Board of Agriculture and the County Councils, with, it might be, aid from private benefactors. He believed the importance of forestry as a national question must sooner or later be recognised. Its elements were complex, and it touched large social problems; but the whole question ultimately resolved itself into one of the application of science. To botanists they must look, in the first instance, for the propagation of the scientific knowledge upon which this large industry must rest. They must be the apostles of forestry, and forestry in turn would react upon their treatment of botany. Botany could not thrive in a purely retrospective atmosphere. It could only live by keeping in touch with the national life, and the path by which it might at the present time best do this was that offered by forestry.

FEUS AND BUILDING LEASES IN SCOTLAND.

THE report of the select committee appointed to inquire into the subject of feus and building leases in Scotland has prepared its report, which has been published as a parliamentary paper. The report is dated July 26, and extends to fourteen pages, and appended to it are the proceedings of the committee. The matter first dealt with is "commutation of casualties of superiority." After describing the law and practice in the matter of the exaction of casualties by superiors, the report says:—"There appears to be now a prevalent consensus of opinion, both professional and lay, that it would be desirable to put an end to such payments as relief duty and composition, for reasons of general policy and public interest, and the question comes to be, should this be enforced by legislation, and if so, upon what terms?" From what has been already said, it is plain that both these casualties are well-known parts or adjuncts of the estate of superiority, and that Parliament could not be asked to abolish them without providing in some form a fair equivalent

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to the superior. The purchase of superiorities has long been a favourite form of investment in Scotland, especially for trustees in charitable, ecclesiastical and other trusts of prolonged endurance, and in the price given for them regard has been had not only to the annual feu-duties, but also to the casualties. In some cases where the feu-duty has been nominal or little more than nominal, the casualties have been of large amount and have thus constituted the only valuable part of the estate of superiority purchased. The first point to be considered is whether the abolition of the casualties in question should be optional either to the superior or to the vassal, or to both, or whether it should be compulsory, and the preponderance of opinion among the witnesses examined is to the effect that it should be compulsory. The Act of 1874 has certainly failed to bring about commutation upon any considerable scale, and even if the option of claiming commutation was extended to the superior, it is very doubtful whether this would greatly enlarge the number of cases in which the casualties would be commuted. The committee concur in the view that it would be desirable to provide by legislation that all existing casualties should be compulsorily commuted, and that even the stipulation for casualties of fixed amounts becoming due at specified periods, allowed by the Act of 1874, should be prohibited for the future, the sole payments to be hereafter stipulated to be made by the vassal to the superior in respect of the feu, to take the form of an annual feu-duty, provided always that a just basis for the commutation could be arrived at. Upon this essential point, however, as well as upon the question at what time the commutation should be enforced, a difference of opinion exists among the members of the committee. A minority of the committee think that commutation should be compulsory and immediate, and that the basis of commutation of casualties becoming due on the death of the last-entered vassal should be the capital value of one casualty (in addition to any casualty which may have already become due), convertible into a permanent annuity or addition to the feu-duty at the rate of 3 per cent. upon the capital value of the casualty in the ordinary case, and that where the casualties are stipulated to be paid on each sale or transfer of the property the rate of conversion should be somewhat higher, say 4 per cent. While these are the views entertained by a minority of the committee in regard to the commutation of casualties, a majority feel themselves unable to recommend that immediate compulsory commutation should be enforced by legislation, partly upon the ground

that many vassals would object to having an addition made at once to their feu-duties by way of commutation of a charge which might not fall upon them for many years, and which possibly might never do so, and partly because it is, in their opinion, impossible to arrive at a basis of present commutation which could be fairly applied to all cases. It appears to a majority of the committee that the best course would be to provide that compulsory commutation should not be enforced until a casualty of composition should become due, and they would recommend that it should then be in the option of the vassal either to pay the casualty in a capital sum, or to have it converted into an addition to the annual feu-duty, arrived at by taking 3 per cent. upon the capital value or amount of the composition. While it is difficult to average the chances of future casualties being relief or composition, it appears to a majority of the committee that substantial justice should be done by providing that all future casualties would be compulsorily commuted in respect of a permanent addition to the feu-duty of, say 1 per cent., on the amount or value of the composition which had already become due in the ordinary case, and a somewhat larger amount, say 1½ per cent., where by the terms of the grant a casualty is payable on every sale or transfer of the property. This payment, beginning to run from the date of the first composition falling due after the passing of the Act of Parliament requiring compulsory commutation, would provide what would be in effect a sinking fund, to serve as an equivalent to all subsequent casualties, whether relief or composition.

Taking up the subject of the enfranchisement of building leases, the committee advise that provision should be made by legislation for the enfranchisement of building leases in Scotland, whether these leases are for a term of years or upon a tenancy at will. Two methods of bringing about this result might be adopted, either (1) by compelling the lessors to sell the value of their interest for a present capital payment, or (2) by providing that the lessee should obtain a permanent right of feu upon his becoming liable for such feu-duty as would fairly represent the value of the rights which the lessor has in the subject when enfranchisement is claimed.

The next question adverted to is the acquisition of building land by local authorities. The committee suggests that the local authority, whether town council, county council, or other elected body, should be empowered to purchase land by agreement, or compulsorily, for the purposes either of providing sites for dwellings for workmen or other persons, or of other-

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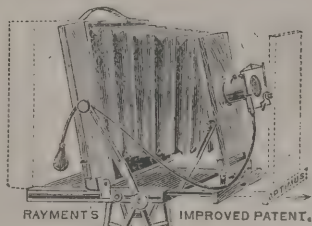
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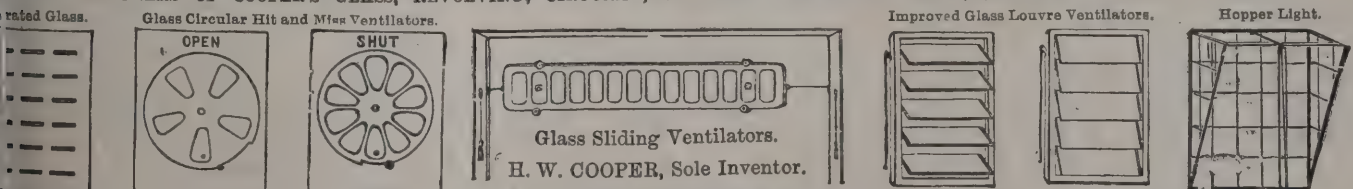
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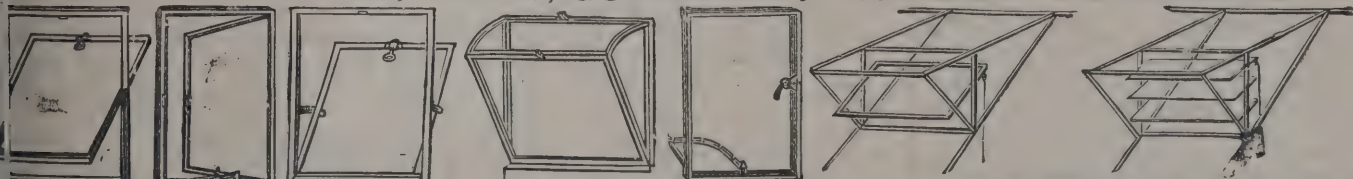


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wise providing for the present or prospective development of the town or village. It appears to the committee that, subject to the review or control immediately afterwards suggested, considerable latitude might be left to the local authorities, both as to the purposes for which the land might be acquired, and as to the manner in which it should be dealt with when acquired, whether by letting on lease, feuing, or selling to the persons by whom it was to be occupied. A question of much practical importance, and of no small difficulty, has been brought under the notice of the committee in regard to a hardship complained of by feuars of building ground in Motherwell, Hamilton, and other places where the industry of mining is largely carried on. Having described the problem, the report proceeds:—"What has now been said sufficiently indicates the view which the committee take of the suggestions put forward in clause 1 of Mr. Crawford's bill, *vide licet*, that where land has been or shall be feued or let upon a condition that buildings were or are to be erected thereon by the vassal or lessee, any contract or agreement purporting (a) to entitle the superior or lessor to do or authorise to be done any act whereby such buildings may be injured, which but for such contract or agreement he would not have been legally entitled to do; or (b) release the superior or lessor from any liability to pay damages for doing injury to such buildings, or authorising any act whereby injury was caused to the buildings, which but for such contract or agreement he would have been liable to pay, shall be void. A majority of the committee further think that the Legislature might properly declare that the provisions of such feu grants shall be invalid in so far as they involve a repugnancy, and in particular in so far as they purport to impose an obligation upon the vassals to rebuild their houses or other erections after they have been destroyed by mineral workings, especially as the obligation would, according to its terms, bind the vassals to re-erect the buildings as often as they might be brought down by the mineral workings. The considerations which prevailed with the majority of the Judges of the Court of Session in the case of Buchanan, &c. v. Andrew, 9 M. 554, would seem to warrant such a statutory interference with the grants. A minority, however, consider that such legislation should be made applicable only to future feus. It is to be observed that little if any practical advantage would accrue to vassals from legislation limited to this point, as buildings are seldom totally destroyed by mineral workings, and it has not been proved that in any such case the superior has called upon the vassal to rebuild."

THE NEW WEST INDIA DOCK.

FOR many years the West India Dock has practically been lying idle, its depth and entrance capacity being quite insufficient. The adoption of a working union between the London and St. Katharine and the East and West India Docks Companies induced the directors of the two undertakings rather more than a couple of years ago to embark upon considerable expenditure, in order to carry out works intended to enable the West India export and import docks to be utilised in their full extent. Plans were prepared by Mr. Robert Carr, but before the execution of the contract began that gentleman suddenly fell ill, and it was found necessary to relieve him of responsibility by appointing Mr. H. F. Donaldson. Mr. Carr's services were retained for consultative purposes, but the entire scheme has been carried out under the personal direction of Mr. Donaldson, who has been publicly congratulated by both Boards on the fact that the work has been completed, not merely in the time specified, but within the original estimate of 200,000*l.*, notwithstanding that several material and costly additions have since been made to the design.

The improvement consists of a new entrance lock opening from the river into the Blackwall basin, together with two new cuts passing between concrete walls from that basin into the import and export docks respectively. As at first planned, the cuts were to have been short locks, but the directors decided that they should be open, without gates, the length being insufficient to provide lockage, while, except as a safeguard, locks were considered unnecessary. It was also proposed at the outset that the entrance lock, which is 60 feet wide, should be 430 feet long, but eventually it was resolved that the lock should be 480 feet, while the uniform depth of 30 feet over the sills will enable the docks to receive the largest merchant vessels trading to the Port of London. The dock gates, like those at Barry and elsewhere, will be opened and closed by means of powerful direct-acting rams, which obviate the difficulty caused by the fouling of twin screws when chains are used. The bulk of the work was entrusted to Messrs. Lucas & Aird, in whose contract was included everything except the gates, the machinery necessary for pumping and hydraulic purposes, and the lengthening of the railway bridges over the two cuts. Messrs. Armstrong & Co., Limited, of Elswick, have supplied the whole of the hydraulic machinery; the pumping machinery has come from the works of Messrs. Easton & Anderson, of Erith; and the bridges on the railway of the

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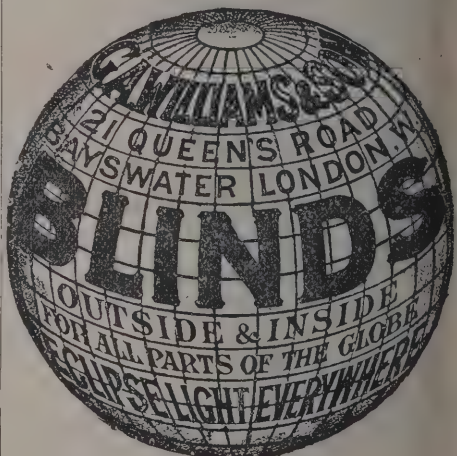
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joint committee have been lengthened from 45 feet to 60 feet by Messrs. W. Erroll & Co., of London and Glasgow, without any interruption of the traffic.

In conjunction with the new entrance, it was decided to erect a quay extension, 20 feet wide, providing six berths, on the north side of the import dock. This work was entrusted to Mr. John Price, of Westminster, and the cranes are being supplied by Messrs. Tennant, Walker & Co., of Leeds. The works do not include any addition to the warehouse accommodation provided by the docks, but a considerable sum has recently been spent in the neighbourhood of the Blackwall basin and the Junction Dock in meeting the requirements of the hardwood trade. Overhead travellers worked by electricity have there been erected for manipulating timber in large logs, and the results from every point of view have been eminently satisfactory.

The river is now much cleaner than it was some years ago. It is hoped, therefore, that the dredging necessary on the part of the joint committee will be reduced to a minimum, and the level of the water in the docks will, by means of pumps laid down, be kept slightly above the rise of the highest tides. A novelty has been introduced in connection with the delivery of water into the docks. In order to prevent the cross-currents which are always experienced when the stream enters from the side, Mr. Donaldson has adopted the principle of the domestic bath, and the water will enter at the bottom of the docks through orifices covered by metal discs. By this arrangement no difficulty will occur to ships leaving or entering the docks. The London County Council are rebuilding the Isle of Dogs bridges, and the means of public access to the new dock will thus be much improved.

ELECTRIC WELDING.

A PAPER on "Electric Welding" was read by Alderman B. A. Dobson, J.P., of Bolton, at the meeting of the Institution of Mechanical Engineers, held at Manchester. He said that practical everyday working for nearly three years of the process of welding by electric force enabled him to give certain indications and appreciations of the method considered as a practical workshop operation. During this period his firm had had two machines in operation, worked from the same generating dynamo, and employed on different classes of work.

One was specially arranged for piecing bar iron and steel, and the other and smaller machine for special classes of work of a more delicate description, such as brazing and the piecing of clean finished work, where the fire heat would have destroyed the quality of the work on the adjacent material. The statement made with regard to the requisite mechanical power placed great difficulties in the way at first, as it was found that this power had been much understated. The company having control of the welding machine supplied a portable engine capable of working up to 100 indicated horse-power with 800 lbs. pressure, and it was placed at a distance of about 45 yards from the welding machine. This got over the difficulty of power, but was of course more expensive on the score of separate attendance and other cost. But even with this engine it was found that, when piecing the larger diameters—and as yet nothing over $2\frac{1}{4}$ inches had been pieced—if the work was to be done within a reasonable time, the engine was seriously checked in speed. As considerable enlargements were about to be made to the establishment, a portion of a large dynamo-room for electric-lighting purposes was set apart for the welding dynamo and exciter. The distance of the leads from the dynamo to the welding machine was approximately 100 yards. Having a quick-running vertical engine making 140 revolutions per minute, with an extra heavy fly-wheel and abundance of surplus power, he had been able to work the larger diameters without affecting the steadiness of the arc lamps driven off the same engine; and as the load would vary 80 horse-power in the tenth of a second, this result spoke well for the arrangement of the engine and for its governing powers. The greatest variation in voltage of the lighting dynamos had been two volts. The heating effect of the passage of electric energy through a bar of any particular resistance was proportional, not to the amount of energy but to the square of the current simply. In order, therefore, to obtain the greatest heating effect with a given amount of energy, it was advisable to use a very large current at a very small pressure. With this object an alternating current was employed in the Thompson process, and transformed down from something like 300 volts to one volt or even a fraction of a volt. This reduction in pressure was accompanied by an exactly proportional increase in current, and the heating effect of the process was due to the passage of this enormous current through the bar which was to be welded. The bar itself was held between two clamps of copper having a small resistance, and the portion of the bar to be heated

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for welding was that which lay between the two clamps, and which always had a much greater resistance than the clamps themselves or any other portion of the circuit. It must not be imagined that a good weld could always be made by pressure alone. No doubt if the material were perfect in character and thoroughly homogeneous, this might be the case. The iron and steel of commerce are not perfectly pure, and in order to make certain that the work might be subsequently depended upon, it was advisable that the burr formed by the pressure should be reduced by hammering in swages. In common practice at the author's works the following materials had been heated and the undermentioned work had been performed. Welding of steel of every quality, iron of every description from crown to best roller iron and charcoal iron, steel and iron together, wrought-iron and cast-iron; different diameters of the same and different materials. Rivetting in many varieties; work which previously had to be rivetted cold, and which consequently left the strength of the parts uncertain, is now done easily and certainly with the requisite heat. The piecing of countershafts and lathe spindles, where the question of exactness of length was of the utmost importance; screwing taps, rollers and spindles broken in the neck bearings, and brazing of all descriptions, had all been successfully treated. The alloys which have been tried have been done more for the purpose of experiment than for any useful end, and were not successful, owing to their not having been time to persevere sufficiently for ascertaining the precise temperatures and conditions under which the process could succeed. The practical experiments made in the author's works showed almost a better conclusion than the tests shown in published tables from the testing machine of the United States arsenal, for in bending cold here the weld had rarely given way. But in explanation of this it must be borne in mind that all the piecings of plain bars were here more or less swaged. It was well within the mark to state that there was not one out of five hundred welds which turned out a failure or even defective. The question of cost, which of course was of importance to commercial engineers, was not alluded to in detail. The author admitted, however, that the payment of royalty, the cost of horse-power, and the depreciation, which on electrical apparatus was heavy, together brought the cost considerably over the net cost of the ordinary smith's hearth work, while the actual payments in wages and so on were considerably less. The loss in weight of iron was about 1-20th only. It might be taken that on straightforward welds the total cost would be between 10 and 15 per cent. more than

the ordinary smith's work, whereas in delicate work and difficult operations the cost would probably be one-third of the smith's work. But the real advantage of the apparatus, at any rate as at present arranged, was not so much an economy as a method of securing an absolutely reliable result, and occasionally saving considerable expenditure by its special adaptability.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 15055. Leigh Turncock, for "An improved fastener for window-sashes, frames and other purposes."
- 15102. Reginald Haddon, for "Improvements in chimney cowls."
- 15118. Robert Gough, for "An improved apparatus for locking window fasteners."
- 15123. William Peyton, for "An improved chimney-pot and ventilator."
- 15149. Lawrence Robson, for "Improvements in windows."
- 15241. Elisha Andrews, for "Improvements in window-sashes."
- 15267. Frederick William Hitchin, for "Improvements in cord-holders for window-blinds and other purposes."
- 15302. Oscar Elphick, for "Improvements in water-closets."
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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

THE ARCHITECT AND CONTRACT REPORTER.

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TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

ABERAVON.—Sept. 8.—For Rebuilding Crown Hotel. Messrs. Lambert & Rees, Architects, Bridgend.

BARKING.—Sept. 11.—For Supply of 400 Yards of 1½-inch, 350 Yards Broken Guernsey Granite and 800 Yards Kentish Flints. Mr. C. Dawson, Local Board Offices, East Street, Barking.

BELFAST.—Sept. 5.—For Alterations to Church. Mr. Wm. Batt, Architect, Garfield Chambers, Belfast.

BLACKBURN.—Aug. 31.—For Building Church. Messrs. Wright & Son, Surveyors, Lancaster.

BLACKBURN.—Aug. 31.—For Building St. Silas Church in Preston New Road. Messrs. Paley, Austin & Paley, Architects, Lancaster.

BOLTON.—Sept. 3.—For Taking Down and Rebuilding Steel Girder Bridge. Borough Surveyor, Town Hall, Bolton.

BOSCOMBE.—Sept. 10.—For Additions at Sanitary Hospital. Mr. F. W. Lacey, Borough Surveyor, Bournemouth.

BRADFORD.—Sept. 3.—For Additional Wards, &c., at General Infirmary. Messrs. Milnes & France, Architects, Bradford.

BRITON FERRY.—Sept. 10.—For Building Eight Cottages. Mr. John Jones, Architect, Briton Ferry.

BURTON-ON-TRENT.—Aug. 31.—For Alterations to Wins-hill Girls' School, and Erection of Infants' School. Mr. Reginald Churchill, St. Paul's Square, Burton-on-Trent.

CAMBRIDGE.—Sept. 14.—For Construction of about 3,000 Yards of Brick Sewers and 90,000 Yards of Pipe Sewers, with River Crossings, Manholes, &c. Mr. J. T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CARDIFF.—Sept. 11.—For Building Vagrant Wards, &c., at Workhouse. Mr. E. Seward, Architect, Queen's Chambers, Cardiff.

CARDIFF.—For Building Biscuit Factory and Warehouses. Messrs. Veall & Sant, Architects, Cardiff.

CARLISLE.—Sept. 5.—For Laundry Buildings at St. Mary's Home, Newtown. Messrs. Johnstone Bros., Architects, 39 Lowther Street, Carlisle.

CARLISLE.—For Alterations to Workhouse, Harraby Hill. Mr. Geo. Armstrong, Architect, 45 Lowther Street, Carlisle.

CASTLETON.—Sept. 12.—For Construction of Sewage Purification Works. Mr. James Diggle, Engineer, 29 Alexander Street, Heywood.

CHELSEA.—Sept. 11.—For the Erection of a Doctor's House and Nurses' Quarters at Cale Street and Sydney Street. Messrs. Landsdell & Harrison, 12 Compton Terrace, N.

CHORLTON-CUM-HARDY.—Sept. 8.—For Detritus Tanks, Engine-house, &c. Mr. A. H. Mountain, Engineer, Town Hall, Withington.

CRUMLIN.—Sept. 1.—For Building Twelve Houses. Mr. W. L. Griffiths, Architect, 27 High Street, Newport, Mon.

DEPTFORD.—Sept. 12.—For Filling-up with Dry Rubbish the Basin in Foreign Cattle Market. Guildhall, E.C.

DEWSBURY.—Sept. 4.—For Additions to Workmen's Club. Messrs. Holtom & Fox, Architects, Dewsbury.

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DONAGHADEE.—Sept. 5.—For Building Villa. Mr. T. Pentland, Architect, 81 High Street, Belfast.

DURHAM.—Sept. 3.—For Building Footbridge. Town Clerk, Durham.

ECCLES.—Sept. 5.—For Constructing Pipe Sewers. Mr. A. C. Turley, Town Hall, Eccles.

EDINBURGH.—Sept. 8.—For Additions to Royal High School. Mr. Wilson, Architect, 3 Queen Street, Edinburgh.

FARNHAM.—Sept. 4.—For Building School. Mr. J. Alfred Eggar, Architect, Farnham, Surrey.

FLEETWOOD.—Sept. 1.—For Constructing Jetty. Mr. J. Tildsley, Town Hall, Fleetwood.

FULHAM.—Sept. 6.—For Heating and Hot-water Supply. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

FULHAM.—Sept. 6.—For Engineering Work at Western Hospital, Seagrave Road. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

GORLESTON.—Sept. 3.—For Additions to Board Schools. Mr. H. Dudley Arnott, Architect, High Street, Gorleston.

GRIMSBY.—Sept. 7.—For Building Schools for St. John's Church. Mr. Herbert C. Scaping, Architect, Victoria Chambers, Grimsby.

HALIFAX.—Sept. 7.—For New Wing to National School, Norland. Mr. C. F. L. Horsfall, Architect, Lord Street Chambers, Halifax.

HARROGATE.—Sept. 7.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

HARRINGTON.—Sept. 3.—For Additions to Board Schools. Mr. W. G. Scott, Architect, Victoria Buildings, Workington.

HAVANT.—Sept. 5.—For New Ward at Workhouse. Mr. Loncroft, Clerk to the Guardians, West Street, Havant.

HORNSEY.—Sept. 17.—For the Supply of 100 or 200 Fire Hydrants and Covers. Mr. F. D. Askey, Southwood Lane, N.

KING'S LYNN.—Sept. 8.—For Additions to East Anglian Hotel. Mr. E. J. Colman, Architect, King's Lynn.

LISBURN.—Sept. 6.—For Construction of Extensive Works for the Water Supply. Mr. John Lanyon, Engineer, Northern Bank Chambers, Belfast. Mr. Richard Young, Lisburn, Town Clerk.

LIVERPOOL.—Sept. 18.—For Erection of Superstructure of proposed Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LIVERSEDGE.—Sept. 3.—For Rebuilding Victoria Mills. Mr. Alfred E. Rhodes, Architect, Union Street, Heckmondwike.

LLANRWST.—Sept. 7.—For Erection of Board School and Master's House. Mr. Richard James, Llanwrst.

LLWYNYPPIA.—Sept. 10.—For Building Thirty Houses. Mr. T. B. Phillips, Llwynypia.

LOUGHAGHRY.—Sept. 5.—For Alterations to Church. Mr. Wm. Batt, Architect, Garfield Chambers, Belfast.

MARPLE, STOCKPORT.—Sept. 3.—For Construction of Outfall Sewerage Works. Mr. Henry Bancroft, Engineer, 88 Mosley Street, Manchester.

MANCHESTER.—Sept. 3.—For Providing, Laying and Jointing Iron and Stoneware Pipes, including the Building of Manholes, Lampholes, &c., of about the following Lengths of Sewers, viz.:—25 Lineal Yards of 12-Inch Iron Pipes, 1,126 Lineal Yards of 15-Inch Stoneware Pipes, 1,738 Lineal Yards of 12-Inch Stoneware Pipes, 335 Lineal Yards of 9-Inch Stoneware Pipes, 106 Lineal Yards of 6-Inch Stoneware Pipes. Mr. Henry Bancroft, C.E., 88 Moseley Street, Manchester.

MEVACISSEY.—Sept. 3.—For Building Lifeboat House, Engineer, National Lifeboat Institution, 17 Victoria Street, Westminster, S.W.

MIDSOMER NORTON.—Sept. 5.—For the Construction of Precipitation Tanks and Filter Beds, and Providing and Laying about 1,000 Feet Run of 12-Inch Stoneware Pipe Sewer and Levelling the Site of Irrigation Area. Mr. C. Nicholson Lailey, 16 Great George Street, S.W.

NEWBOLD.—Sept. 11.—For Building School. Mr. J. W. Fearn, 31 Devonshire Street, Chesterfield.

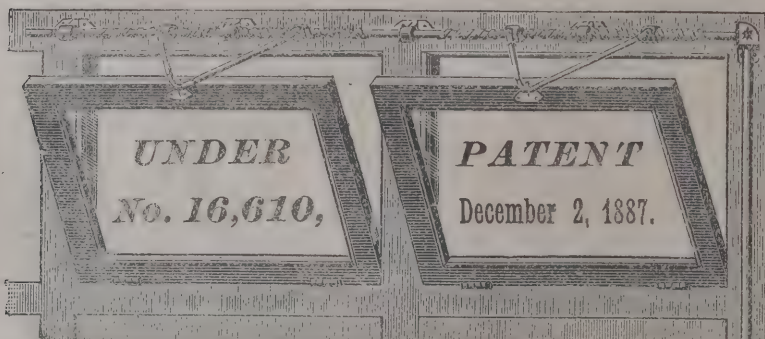
PANNAL.—Sept. 3.—For Pulling Down and Rebuilding Hotel. Mr. T. Winn, Architect, 90 Albion Street, Leeds.

PONTYPRIDD.—For Building Villa. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

PONTYPRIDD.—Sept. 5.—For Building Board Schools. Mr. J. Rees, Architect, Hillside Cottage, Pentre.

PORTH.—Sept. 10.—For Building Forty-five Cottages. Mr. D. W. Jones, Tynewydd Hotel, Porth.

PORTSMOUTH.—Sept. 12.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.



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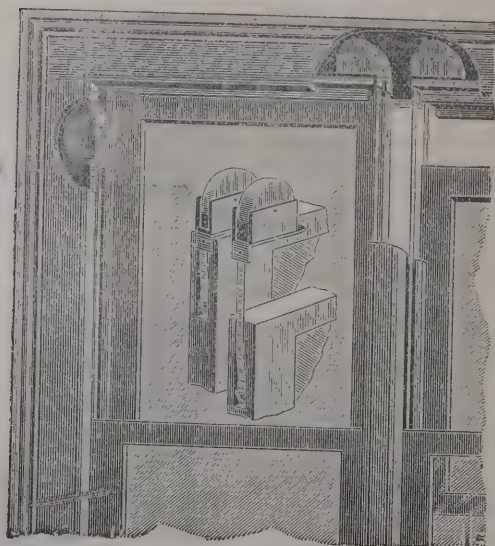
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RADNOR.—Sept. 10.—For Pulling-down and Restoring Nave and Tower of St. Michael's Church, Beguildy. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

RIVER MERSEY.—Sept. 3.—For Construction of Settling Tanks, Filters, Sludge Tanks, Building Cottage, Committee-room and Store-room, and Formation of Roads, Footpaths, &c., in Connection with Outfall Sewerage Works. Mr. Henry Bancroft, C.E., 88 Moseley Street, Manchester.

RUABON.—Sept. 17.—For Additions to Board Schools. Mr. J. Denbigh Jones, Clerk, Johnstown, Ruabon.

SANDBACH.—Sept. 1.—For Constructing Waterworks. Mr. W. Wyatt, Pride Hill Chambers, Shrewsbury.

SMETHWICK.—Sept. 14.—For the Construction of about 1,900 Yards of Brick Sewers and Conduits, and 3,700 Yards of Pipe Sewers with Manholes, Lampholes, Bell-mouths, &c. Messrs. Harris & Harris, 9 Bennett's Hill, Birmingham.

ST. PANCRAS.—Sept. 3.—For the Construction of a Pipe Sewer in Albany Street. Mr. Wm. N. Blair, C.E., Vestry Hall, Pancras Road.

WALTHAMSTOW.—Sept. 7.—For Making-up and Laying Concrete Flags. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Sept. 7.—For Supplying and Fixing about 60 Rods of Oak Park Fencing. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

TENDERS.

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For Erection of Two Semi-detached Houses, Dover Street, Bilston, Staffs, for Messrs. Greenfield & Colley. Mr. J. MASON, Architect, Victoria Chambers, Bilston Street, Wolverhampton.

C. E. BURTON, Wolverhampton (accepted) .£922 0 0

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For Building Shops, Stores and Tenement Dwelling-houses, Rosemount Place, for the Northern Co-operative Company, Limited, Aberdeen. Mr. ALEXANDER MAYOR, Architect, 211 Union Street, Aberdeen.

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W. Farquharson, mason	£3,740	0	0
D. MacAndrew & Co., carpenter	1,900	0	0
Scott & Sellar, plasterer	798	18	0
J. F. Anderson, plumber	459	11	0
W. McKinnon & Co., ironwork	451	3	4
J. Garvie & Sons, painter and glazier	285	10	0
G. Davidson, jun., slater	5	0	0

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T. SMITH, Otley (accepted)	£3,492	9	9

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R. Grain & Son, Cockermouth	£65	5	0
T. REAY, Cockermouth (accepted)	59	7	6

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For the Erection of a Lodge at Springhill, Bromley, Kent, for Mr. W. Bowley. Mr. PERCY B. STRUDWICK, Architect, Bromley, Kent.

R. Harmer	£635	0	0
W. Grubb	560	0	0
F. Duthoit	524	0	0
J. Podger	523	15	0
W. Prebble & Co.	520	0	0
J. GRATY (accepted)*	519	0	0

* Subject to slight reduction.

For Erection of Two Chapels and Caretaker's House for the St. Luke's Burial Board, Bromley, Kent. Mr. PERCY B. STRUDWICK, Architect, Bromley, Kent.

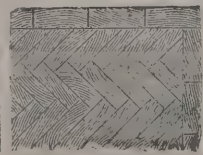
W. A. Grubb	£1,090	0	0
Jones, Richards & Co.	995	0	0
R. HARMER (accepted)	955	0	0

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J. Casey	321 15 0
R. C. Daley & Co.	259 13 3
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D. R. BRADBURY (accepted)	173 3 6

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James & Son, Newbury	700 0 0
H. Hoskings, Hungerford	697 0 0
F. New, Chilton Foliat	665 18 4
W. Moulding, Aldbourne	575 0 0
G. ELMS, Benham (accepted)	549 0 0

CHRISTCHURCH.

For Works of Sewerage, near the Christchurch National School. Mr. R. WALTER KNAPP, Surveyor.

W. Howe, Christchurch	£105 0 0
W. J. AYLES & SON, Ringwood (accepted)	62 10 0
Surveyor's estimate	65 0 0

CLEATOR MOOR.

For Stone Building at the Gasworks, Cleator Moor, for the Local Board.

R. & D. PEARSON, Jacktrees Road (accepted)	£61 8 6
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For Works required in Erection of a Villa Residence, Out-buildings, &c., at Whitehall, Darwen. Mr. JOHN B. THORNLEY, Architect, 45 Market Street, Darwen.

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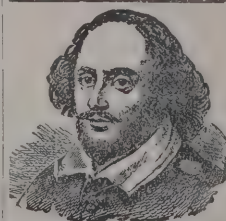
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T. Steel & Son, slater	155	4	0
J. Inglis & Son, plumber	153	7	9
J. W. Mackie, Glasgow, tile linings	77	7	5
T. Hoggan, painter	43	12	10
J. M'Farlane & Co., Greenock, heating apparatus	42	12	10
W. Ure, plasterer	36	18	8
Total	£2,302	12	5

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For Carrying-out New Drainage Scheme for Far Cotton.			
J. H. Vickers, Nottingham	£8,184	15	10
G. T. Band, Essex	7,980	0	0
G. Fisher, Northampton	7,550	0	0
Green Bros, Northampton	7,280	0	0
R. Finnegan, Northampton	7,203	7	5
H. Martin, Northampton	7,130	0	0
T. Cosford, Northampton	7,116	0	8
S. Wood, Northampton	6,986	16	2
Branson & Son, Northampton	6,942	19	2
Siddons & Freeman, Oundle	6,700	0	0
W. Gregory, Northampton	6,539	13	8
H. WELDON, Birmingham (accepted)	6,534	8	10

KNIGHTLEY.

For Additions to Knightley School, Eccleshall.			
J. Jarvis, Stafford	£230	0	0
W. Whitfield, Stone	197	0	0
T. Plant & W. Cliffe, Knightley	164	14	8

LEICESTER.

For Building Eight Cottages, Pye Bridge Station. Mr. CHAS. KEMPSON, Architect. Quantities supplied.			
<i>Whole Tenders.</i>			
Macandrews, London	£1,699	0	0
Richardson & Son, Leicester	1,579	0	0
Major, Leicester	1,550	0	0
M. Martin, Leicester	1,540	0	0
Stubbs, Eastwood	1,430	0	0

LEICESTER—continued.

Bricklayer.

Brentnall, Alfreton	£712	0	0
Stubbs, Eastwood	672	0	0
Tebbutt, Leicester	625	0	0
LEE, Nottingham (accepted)	593	0	0

Joiner.

Hanson, Leicester	593	0	0
Williamson, Nottingham	450	0	0
Tebbutt	407	0	0
Bailey, Riddings	355	0	0
Cole, Leicester	312	0	0
Stubbs	279	0	0
LEE (accepted)	300	0	0

Painter.

Williamson	65	0	0
Burnham, Alfreton	63	0	0
Shaw, Alfreton	56	0	0
Stubbs	46	0	0
Lee	46	0	0
BURTON, Alfreton (accepted)	38	0	0

Plasterer.

Williamson	120	0	0
Brentnall	110	0	0
Tebbutt	117	0	0
Woolley, Leicester	109	0	0
LEE (accepted)	100	0	0
Stubbs	97	0	0

Plumber.

Shaw	200	0	0
Burnham	186	0	0
Getliffe, Leicester	179	0	0
Rowlatt & Freer, Leicester	172	0	0
Bamber, Ilkeston	170	0	0
Lee	162	0	0
Pallett, Leicester	161	0	0
BURTON (accepted)	152	0	0

Slater.

Broadbent, Leicester	92	0	0
N. Mills	89	0	0
LEE (accepted)	85	0	0
Nixon & Knowles, Nottingham	82	0	0

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LLWYDGOED.

For Building Church at Llwydgoed, near Aberdare. Mr. G. E. HALLIDAY, Architect, 14 High Street, Cardiff.	
J. Williams, Knighton	£1,150 0 0
Bennett Bros., Swansea	1,070 0 0
Hatherly & Carr, Bristol	999 0 0
WILLIAMS & THOMAS, Cardiff (accepted)	975 0 0
Howell & Co., Cardiff	904 0 0
Architect's estimate	1,000 0 0

NEWMARKET.

For Improvement Works, Rous and Lisbon Roads, Newmarket, for Local Board. Mr. J. W. METCALF, Surveyor, Town Hall, Newmarket.	
H. Plummer, Rattlesden	£1,506 18 0
T. G. Cowell, Soham	1,343 10 0
R. Arber's Exors., Newmarket	920 8 6
Victoria Stone Company, London	883 4 4
S. HIPWELL, Wisbech (accepted)	862 10 6
Surveyor's estimate	880 0 0

OVER WALLOP.

For Building School and Master's House at Over Wallop, for the Wallop School Board. Messrs. J. HARDING & SON, Architects, 51 Canal, Salisbury.	
C. Robinson, Broughton	£3,132 6 6
C. Stevens, Salisbury	2,990 0 0
F. Dibben, Salisbury	2,986 0 0
Webb & Co., Salisbury	2,819 16 0
H. J. Kite, Salisbury	2,750 0 0
Annett & Son, Andover	2,700 0 0
W. N. Hobbs, Twyford	2,699 18 0
F. BEALE, Andover (accepted)	2,534 0 0
Macandrews & Co., London	2,440 0 0

ST. BURYAN.

For Reseating and General Renovation of St. Buryan Wesleyan Chapel. Mr. J. B. SANDERS, Jun., Architect, Savings Bank Buildings, Penzance.	
C. Chapman, Penzance	£270 0 0
W. Walters, Penzance	265 0 0
A. Mann, St. Buryan	260 0 0
J. James, Penzance	247 10 0
R. H. ROBERTS, St. Just (accepted)	249 0 0
Architect's estimate	250 0 0

SYSTON.

For Carrying-out Syston Sewerage Scheme. Mr. C. OGDEN, Engineer, Leicester.	
Philbrick, Leicester	£6,087 0 0
Smart, Nottingham	6,038 10 0
Wright, Wigston	6,019 0 0
Bentley, Leicester	5,869 0 0
Mason, Leicester	5,774 0 0
THUMBS, Nottingham (accepted)	5,735 5 0

TOTTENHAM.

For Alterations and New Billiard-Room to the Rose and Crown Hotel, High Cross, Tottenham, for Mr. Morris Benjamin. Mr. JOHN E. PINDER, Architect, Bridge House, South Tottenham.	
Godfrey & Son	£920 0 0
H. Knight & Son	893 0 0
Green & Smith	768 0 0
W. SMITH, Camberwell (accepted)	729 0 0

TREDEGAR.

For Additions to Schools, for the Bedwellty School Board. Mr. W. S. WILLIAMS, Architect, Tredegar.	
Earl Street.	

T. Edwards.	£789 14 0
S. Arrowsmith	787 0 0
R. Edwards	731 0 0
E. MORGAN (accepted)	712 0 0

George Town.

E. Morgan	730 10 0
T. Edwards.	716 0 0
S. Arrowsmith	712 0 0
R. EDWARDS (accepted)	710 0 0

Victoria.

S. Arrowsmith	805 0 0
T. Edwards.	800 0 0
E. Morgan	790 0 0
R. EDWARDS (accepted)	785 12 0

WINDERMERE.

For Building Dwelling-house, Broad Street, Windermere, for Mr. T. H. Cusins. Mr. ROBERT WALKER, Architect, Windermere.	
Accepted Tenders.	
Henry & Son, mason, walling, &c.	£212 0 0
Latham & Dobson, joiner	150 0 0
W. P. Musgrave, plumber	47 0 0
Moore & Steele, painter, &c.	17 0 0

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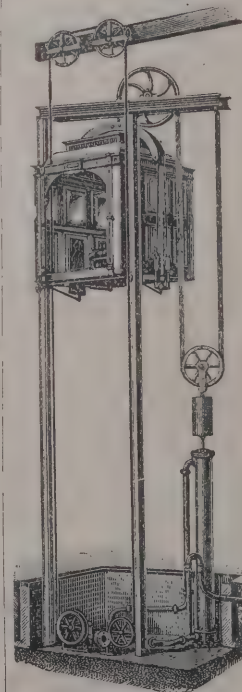
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TRADE NOTES.

A NEW public clock has been erected by the inhabitants in the tower of the parish church, Stanhope, Weardale, co. Durham, by voluntary subscriptions, the Right Rev. the Bishop of Richmond acting as chairman, and Mr. W. M. Egglestow as hon. secretary of the committee. The necessary work has been executed by Messrs. Wm. Potts & Sons, clock manufacturers, 13 Guildford Street, Leeds, and 22 Collingwood Street, Newcastle-on-Tyne, Mr. John Parker Stanhope doing the joiner-work. The clock is made from the designs and plans of Lord Grimthorpe.

A FRESH issue in monthly parts is about to appear of "Cassell's New Popular Educator." This work has recently been revised throughout, and new maps and coloured plates added. The first part will appear on September 25.

THE contract for supplying and fixing three lifts, together with pumping plant, at the Admiralty Extension buildings, has been taken by Messrs. R. Waygood & Co., of Falmouth Road, Great Dover Street, S.E. They also have in hand passenger and other lifts, of their latest type, as follows:—The German Embassy, Carlton House Terrace, S.W.; the Buckingham Palace Hotel, Buckingham Gate, S.W.; the Army and Navy Co-operative Stores, Coburg Row, S.W.; Mrs. Goldsmid, 14 South Street, Park Lane, W.; Earl Howe, Curzon House, W.; Wellington Court, Knightsbridge, W.; Messrs. Harvey, Nicholls & Co., Knightsbridge, W.; Avondale Mansions, Piccadilly, W.; Gower House, Euston Road, N.W.; offices, Messrs. Joseph & Smith, Basinghall Avenue, E.C.; Messrs. Johnson & Co., Farringdon Road, E.C.; business premises, 28 Bevis Marks, E.C.; Mr. S. Joseph, 1 Bevis Marks, E.C.; Messrs. Perrott & Perrott, Tenter Street, Moor Lane, E.C.; Messrs. W. Angus & Co., Leonard Square, E.C.; Messrs. W. & J. R. Hunter, 57 Moorgate Street, E.C.; Messrs. Salmon & Gluckstein, Clerkenwell, E.C.; the *Strand Magazine*, Southampton Street, Strand, W.C.; Messrs. Nicholls & Clark, Shore-ditch, E.; Messrs. Taylor, Garnett & Co., Examiner Buildings, Manchester; Mr. Louis Schwabe, Manchester; Victoria Hotel, Manchester (alterations); the Corn and Produce Exchange, Manchester; the Bank of England, Liverpool branch; the Preston Bank, Liverpool; Mr. T. Joynson, Liverpool; the Great Western Hotel, Birmingham; the *Western Daily Mail*, Cardiff; the City of Dublin Hospital, Dublin.

THE Pearn's Convalescent Home, near Plymouth, is being warmed and ventilated throughout by means of Shorland's

patent Manchester stoves, with descending smoke flues, and by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE streets and buildings committee of the Edinburgh Town Council, at their meeting, resolved to recommend the acceptance of an estimate for the construction of a new bridge over the Union Canal at Yeaman Place, at a cost of from 1,500*l.* to 1,600*l.*

VARIETIES.

THE death is announced of Mr. John Roberts, senior partner in the firm of Messrs. J. & S. Roberts, ironfounders and engineers, Swan Village, West Bromwich, at his residence, The Hayes, on Sunday, the 26th inst., after a brief illness.

THE Mold Local Board have decided to purchase land for the outfall of the proposed sewerage works at a cost of 670*l.*

THE Bangor City Council have commissioned Mr. J. J. Webster, civil engineer, of Westminster, to prepare plans for a new passenger pier at Garth Ferry. The pier, which will be over 500 yards in length, will cost about 16,000*l.*

THE clerk to the East Ham Local Board has received a cheque for 1,500*l.* from the clerk to the City Parochial Charities towards the cost of the Plasket recreation ground. This is the second sum of 1,500*l.* which has been voted from the City Parochial Charities to this purpose and another 500*l.* is promised.

THE Norfolk County Council have appointed Mr. John Marshall, of Hawick, N.B., district surveyor for Walton, in place of Mr. J. E. Haynes, resigned.

AT the meeting of the Tunbridge Wells Town Council Mr. H. Stowell, from the surveyor's office, Salford, was appointed assistant borough surveyor out of 130 applicants.

THE first stone has just been laid of the new school of science and art which is in course of erection on the site adjoining the Institute in the New Road, Bromsgrove. For some years past the committee have felt that the present building in High Street was altogether inadequate for the growing demands upon the accommodation. To counteract as far as possible the depression in the nail trade, special attention is being paid to ornamental ironwork, in the hope of promoting a new industry for the district. The building in course of erection is from the plans of Mr. John Cotton, of Oxford.

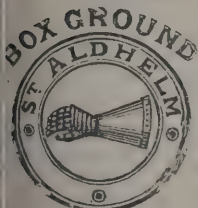
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THE electric lighting sub-committee of the Edinburgh Town Council have accepted offers for steam-engines, alternators, switch-board, rectifiers and insulated cable, amounting to between 4,000*l.* and 5,000*l.*

THE Corporation of Liverpool, in connection with the Sanitary Institute of Great Britain, have arranged a course of lectures on "Sanitary Science" to municipal and sanitary officers, and have invited the city surveyor of Carlisle, Mr. W. Howard-Smith, to deliver a lecture in October upon "Scavenging and the Disposal of Refuse."

THE Theatre Royal, Reading, has been destroyed by fire. It was supposed that the fire must have been caused by lightning.

PLANS have been prepared by Messrs. Gotch & Saunders, of Kettering, for the erection of a proposed general infirmary for Kettering.

THE Eccles Town Council have in hand a scheme for the enlargement of the Town Hall and the erection of a new council-chamber. Land for the purpose has already been secured by the Council at the rear of the hall. Dr. J. Hopkinson has submitted a report to the tramways and electric-lighting committee on the proposed electric lighting of the main thoroughfares of the borough. The new sewage-disposal works at Saltey are fast approaching completion.

AN inquiry has been held into the application of the Harrogate Corporation to borrow 25,180*l.* for public improvement works.

AT the meeting of the Kirkintilloch Dean of Guild Court, plans for the extension of the Lion Foundry were submitted and passed. They provide for the taking in of a large piece of ground at the back of the works, whereby an additional moulding shed will be secured.

THE total value of the plans of new buildings sanctioned by the plans committee of Aberdeen Town Council at the last meeting amounted to about 14,000*l.* One of the plans was that of the new savings bank in Union Terrace. The cost is estimated at 6,500*l.*

THE Sandbach Local Board have decided to carry out a sewerage scheme for the town and district at a cost of 3,000*l.* The scheme has been prepared by Mr. Codling, engineer, of Manchester. The Board are also about to spend between 2,000*l.* and 3,000*l.* in a water scheme and in providing water for some of the districts in the area of the Congleton Rural Sanitary Authority.

NEW CATALOGUES.

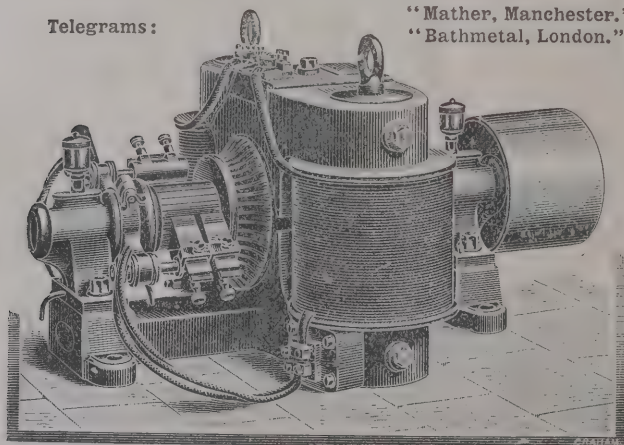
WE have received from Mr. Andrew Potter, of Melbourne Works, Wolverhampton, illustrated price-lists of his various specialties. The waterproof list has every article that can be wanted, including stack cloths, cart covers, waterproof leggings, caps, coats and oilskin goods for all climates, tents, marquees, &c. The wire-netting list deals with all kinds of wire-netting and accessories, also water-tanks and troughs, corn-bins, field hurdles, gates, &c. The netting list is full of details relating to netting for animals, fishing nets, netting for games, cricket, tennis, &c. Other lists refer to the well-known belting, hose, and also hot-water apparatus on a small scale. The last list deals with everything concerned with horses, dogs, &c., horse-cloths, harness, saddles and bridles, whips, india-rubber mats, &c. In this short summary all the articles could not be mentioned, as the requirements of gardens, residences, farm buildings, &c., are endless, and therefore we must refer those interested to the lists themselves as to every possible article for use of agriculturists, farmers, gentry, residents in the suburbs, &c., with all the necessary adjuncts. Not the least among these specialties are those connected with paddock, field, stables, kennels, &c., wants on a small scale as well as large having been catered for.

ROGER DAWSON, LIMITED.

THE employes of the above took their annual bean-feast last Saturday. The party which numbered close upon a hundred journeyed by early train to Portsmouth, where a *recherche* dinner was served at the Sussex Hotel. In the unavoidable absence of Mr. Roger Dawson, who was called away on an urgent matter of business, his co-director, Mr. H. B. Johnson, occupied the chair. Mr. Johnson made some happy allusions to the growing prosperity of the Company, which were received with enthusiasm, and referred to the recent opening of their new works for the manufacture of electric-light fittings, and the new showrooms about to be opened in Berners Street. The Chairman completed an excellent speech by stating that the Company had never since its start had so many contracts and such important work in hand, and he was happy to state that there was every indication of their remaining in their present happy condition for months to come.

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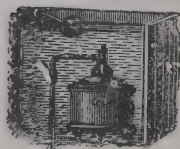
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MECHANICAL VENTILATION.

A PAPER was read at the Glasgow Sanitary Congress by Mr. W. Key on mechanical ventilation and extermination of spores and germs of disease. He claimed for mechanical ventilation by propulsion that grand, sweeping and irresistible air movement within rooms and halls applicable to every description of buildings, that had been found to bring within their reach that nearest approach to the outer air movement which he called "natural ventilation." He described his system at some length, and pointed out that in this city a school could be warmed and ventilated mechanically, so as to give an atmosphere of the greatest purity and at a cost of only one-fourth of a farthing per scholar per week for gas and fuel to propel and warm the air. Abundant pure fresh air and light were the best agents that could be employed for the destruction of microbes.

UNINHABITABLE HOUSES IN GLASGOW.

THE annual meeting of the Sanitary Association of Scotland was opened in Glasgow on Thursday in last week. Mr. Crawford presided.

Dr. Russell, medical officer of health, Glasgow, read a paper on "Uninhabitable Houses. Who inhabit them? Who own them? What is to be done with them?" He described the working of clause 32 of the Glasgow Police (Amendment) Act, 1890. The principle that an uninhabitable house ought to be closed until made habitable was admitted and laid down in the statute law. The question was, How best to carry out that principle? In Edinburgh and Glasgow, and with a much restricted application in England, by by-laws under the Public Health Act, the local authority, as advised by their officials, were entrusted with this duty, and with good reason. The

question of habitability was not one of law but of fact. Who better fitted than the representatives of the citizens to apply their judgment as business men to the determination of the question? In his opinion, the procedure introduced by the 32nd clause had worked admirably, and, he believed, experience was to the same effect in Edinburgh. The new powers were first applied in March 1891, and up to last July 282 houses belonging to over forty proprietors had been dealt with. A closing order had been issued in every case. No appeal had been made to the sheriff excepting in one, and that on a technical point not involving the merits. Only sixteen houses had been made habitable, so that the order could be revoked—a fact which expressed the simple truth that the remainder was so bad that it was impossible to patch them up. No complaint had been made of injustice being done, either through the press or by any association either of landlords or house-factors. He was, therefore, justified in claiming for the 32nd clause the credit of unqualified success. They had now to speak of 282 uninhabitable houses, of which 237 were inhabited. Of the 282 dealt with, 223 were houses of one apartment and 52 of two apartments. Of the 237 occupied houses, 40 were held in lots by persons who farmed them out in rooms furnished to nightly lodgers, generally families. In these uninhabitable houses the average monthly rent of a one-room house was 6s. 5d., of a two-room house 8s. 6d. This represented 2s. 1d. per head accommodated in the former and 2s. per head in the latter. Reducing the rent to a unit of air space obtained, it would be found from a table shown that 1,000 cubic feet cost 5s. 1d. in a one-room and 5s. 9d. in a two-room house. The inhabitants of the uninhabitable dwellings were obviously nomadic. It would be found that half of them lived in one place less than one year, and a third of that half, or nearly 17 per cent., less than one month. Then there was the large class of "uninhabitable casuals," to whom 36 per cent. of the uninhabitable one-room houses were farmed for nightly payments of sixpence or eightpence. But all the tenants of uninhabitable houses were not nomadic. You would find even in the worst tenements instances of prolonged tenancy which attracted your attention like ancient buildings in modern streets. Amid all the coming and going, the racket and rowdiness, these people had remained for ten, twenty, thirty, even forty years—a notable fact deserving close scrutiny as to its meaning. If you asked the employment of the inhabitant of the uninhabitable house, half of the male householders returned themselves as labourers, half of the female as simply

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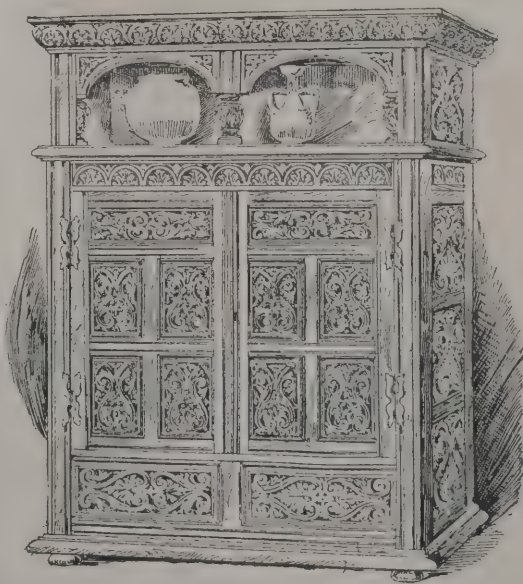
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the housekeeper. The other half in the case of the men were shoemakers, firewood choppers, carters and a long miscellaneous list of tradesmen of all kinds, while in the case of the women they were cleaners and washers, hawkers, mill-workers, &c. There could be no doubt that, in the case of the men, excepting those who called themselves "labourers," the designation of the others was but a mark to indicate the high estate from which they had fallen. He had been in their houses, had spent much time talking with them, and his opinion was that in the main they were the *débris* of the city, the chips and dishonoured stones which fell from the social structure and littered its base. There were the open and undisguised bad, the criminal and immoral, the obviously good and the enigmatical and mysterious, who were in truth most probably bad. He should estimate the good at some 10 per cent. of the whole, including therein a few rough souls who were not exactly teetotalers, but who confined their potations to Saturday night and Glasgow Fair, and as a rule worked hard when they could get work to do. Indeed, the uninhabitable house was pervaded with the smell of whisky predominant over all the other smells. The thief and the prostitute were borne along by it through their brief and unhappy lives. The inhabitant of the uninhabitable house followed the usual law of stratification or assortment. One came to know the lair of the criminal. It was always the back land where watch was readily kept, where defence was easy and attack difficult, where shame was unknown and honour was of the quality which prevailed among thieves. When at noonday you found all the men about playing cards or loafing in the closes and on stairs, and superfluous women lolling over windows or nursing black eyes in corners, you could have no doubt of the calling of the inhabitants. The 32nd clause had broken up several such retreats of vice. It was in such quarters you chiefly met with the mysterious and enigmatical tenant. There was the house in which you were told So-and-so lived, but you never could find him in or get clearly to know what he did, for information as to the comings and goings of people in those localities was difficult to get, but the sanitary man never told the police, and so you at last learned that Mr. So-and-so did a shebeen business and really lived in a more reputable locality except from Friday or Saturday until Monday, when he inhabited the uninhabitable house. Uninhabitable houses which were found in front lands or in single-storey ranges like colliers' rows, abutting on some unbuilt-on space or ranged round three sides of a square, were usually occupied by colonies of unskilled

workmen and labourers, who might be rough in their ways and found their only relaxation in whisky, which now and then led them to the police courts as riotous and disorderly, but they were different from the vicious and criminal people of the back lands. There was also a sprinkling of undoubtedly decent people, the salt of the otherwise festering population, the ten men for whose sake, peradventure, they would not be destroyed. They might say, "Why do they remain there?" Why should the native of St. Kilda stay there? Why did the inhabitants of the Achill Islands stay there? The majority were the remnants of a previous generation of respectable tenants, all of whom had gone as the property deteriorated. A few had formed little businesses in connection with their houses and they all knew how loath people were to shift in these circumstances, so the interests of family life were apt to be sacrificed. Again, and with reference to the death-rate, there were three characteristics of these uninhabitable houses—(1) the deaths always exceeded the births; (2) the infantile death-rate was enormous; (3) the general death-rate was Mediaeval in its dimensions. The important question who own these uninhabitable houses might be very shortly answered. There were forty-one proprietors involved, and only twenty-one of these were individuals; the remainder were either trustees or executors or joint-beneficiaries. This had an obvious bearing on personal responsibility. It behoved every person in the position of a trustee to inquire into the character of the property which he administered; it behoved every beneficiary to ascertain whence the rents were derived. As for the individual proprietors, they lived in houses in the West End, in villas in the suburbs, at coast and in country. Probably no one would be more astonished than those persons themselves if they were told that they had been living on the proceeds of such property. But to plead ignorance was to plead guilty. If they did not know they ought to have known. Factors might represent them, and so keep their names from a publicity which in the circumstances they would richly deserve; but nevertheless on them and their ill-got rents he was old enough fashioned to believe a curse rested which would be sure to find them out. Just think of it. The rents were collected from week to week and month to month by their agents at the doors of those houses. It might be that the very coins which were the reward of iniquity were put into their hands. It was all the same as if they stood at the doors of those houses and held out their hands for the money. But no; they sent some one else to get it, and perhaps they gave a subscription to the

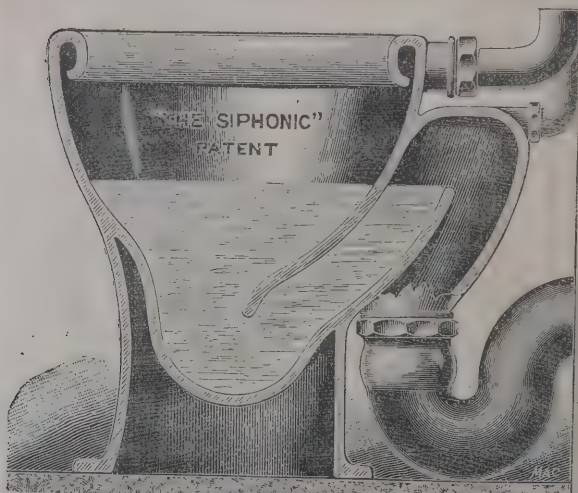
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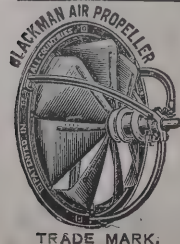


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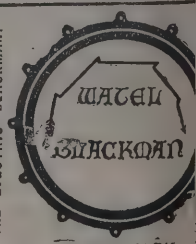
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Home Mission or the Social Union, or they discussed the great city of Babylon in their drawing-rooms, and they stood afar off and lamented when they saw the smoke of her burning. The question, What was to be done with the uninhabitable house? He had already answered—shut it up until it has been made habitable. If operations were not begun at once for its restoration the structure would soon disappear. In twenty-four hours here would not be a pane of glass unbroken; in a week the window-frames, doors and woodwork would be on the move; soon the demon boy would make his way through the roof, and so the work of destruction went on until the very walls were levelled. The question, however, was not merely what was to be done with the uninhabitable house, but what was to be done with the people who inhabited it. It was for the sake of the people that the house was closed. It must be remembered that they were dealing with a limited section of the population. The effect of disturbing these people as regarded the bad was like nothing so much as the driving away a swarm of flies from a raw place on an animal. They rose in a flight and settled down upon the nearest other raw place. The criminal and the drunkard looked out for the nearest property where they would be received, and that was sure to be but a little better than the place they left. For the compact between the landlord and the tenant of such property was an immoral compact. The necessity of finding house-room made the vicious and criminal person accept any hovel; the consciousness that he had an unsound article to sell made the landlord accept the criminal and the vicious as tenants. The object to be aimed at by the sanitarian was to make such a compact impossible by taking away the only reason the landlord had for entering upon it—the fact that he was possessed of an unsound article. But caution was necessary. In Glasgow of late there had been a great destruction of unwholesome property, and consequent disturbance of this restricted part of the population, quite independently of the 32nd clause. In every case of demolition and reconstruction the original occupants were first of all dispossessed, and then the process of selection began. No owner of new property would look at the old tenants. The 10 per cent. of good tenants might go into the Promised Land, but the 90 of bad were compelled to wander in the wilderness. Supposing every landlord said, "I shall not lay out a penny upon my property. I can always get somebody to inhabit it. I shall listen to no complaint of a tenant until I get a notice from the Sanitary Department, and then I shall put off as long as possible, and lead the authorities through every form which involves delay." There were landlords who did this, or their doctors for them. But suppose all did so, what would be the state of the city? He need not attempt the description. Supposing, on the other hand, every landlord said, "I shall keep my property in thorough repair; I shall inquire into every complaint from my tenants, and attend to every notice from the Sanitary Department, and by inspection endeavour to anticipate complaints. I am determined not to harbour thieves and prostitutes: I shall not put up with the drunkard and the night brawler; I shall not make the world easier to live in for the profligate and the unclean." The majority of landlords and factors set before themselves this standard of business. Why not all? If all, what then would be the state of the city? There were many schemes of social restitution before us at present. The oldest was to be found in the Bible, and was based upon righteousness—not righteousness in the air or in the earth, but in the individual. If he were desirous to promulgate a theory of social reform, he would base it by preference upon the higher morality of house owning—a very broad basis, because it included not merely the landlord and the factor, but the trustee and the beneficiary and the bondholder; and besides it touched every tenant. Let us not for gain make broader the way which led to the destruction both of body and soul.

Dr. J. C. McVail said that in the counties of Scotland as distinguished from the burghs the Housing of the Working Class Act took the place of the local Act, whose operations had been described by Dr. Russell. In mining districts, where it was alleged that the minerals would be wrought out in a few years, the closing of houses required to be carried out with much discretion, as there was a strong disinclination on the part of private individuals to erect new houses in their place. In one case he had been consulted by a mining firm as to the plans for a number of new houses in course of erection, and they gladly accepted his suggestions, their policy being that in time of unrest as between labour and capital miners would in many cases prefer to live on in habitable houses rather than go to worse houses connected with pits where the pay might be slightly greater. This was the right view for owners of such properties to take. In the end good house accommodation paid everybody—tenant, landlord and mine-owner.

Mr. Lindsay said one of the great difficulties in country districts was the determining of what was an uninhabitable house. People were found living to an old age in such houses, and it was difficult to prove that they were injurious to health. The Public Health Act should be amended on the lines of the

Municipal Act. It should not be necessary to prove that the house was injurious to health. It should be enough if certificates were granted by three or four responsible officials. He further complained that there was a lack of supervision of house property while in course of erection.

Dr. Munro, Renfrew, said the question had been asked what to do with the uninhabitable houses, but his own particular concern was what to do with the evicted tenants. In the counties the difficulties were greater than in the city. The only solution, he believed, was that this residuum must be the special charge of the community, who must make provision for housing them. They required to be policed into anything like good hygienic habits, and only under the operation of compulsory powers would municipal authorities be enabled to maintain model buildings under model conditions.

The Chairman, in closing the discussion, remarked that it should have some definite practical outcome. They were going to have next year a new Public Health Act for Scotland, and he thought there should be embodied in it powers to local authorities, rural or urban, similar to those we had in Glasgow. The moral effect of these powers had been enormously greater than the figures given by Dr. Russell showed. The plea that was almost always put before the court was that the parties implicated were willing to do anything the court might order, and that if the officers came in a month or two they would find that defects had been remedied. But the court held that they had been found breaking the law, and the punishment of breaking the law was that the houses must be closed. The moral effect of this upon proprietors throughout the city had been greater than the effect they had been able to achieve by passing closing orders. He moved that they should call upon the Secretary for Scotland to insert in the new Public Health Act a provision giving similar power to that contained in the Glasgow Act to all local authorities.

The motion was carried by acclamation.

TESTING INSTRUMENTS.

A PAPER was read at the meeting of the British Association in Oxford on "Engineering Laboratory Instruments and their Calibration," by Professor David S. Capper, M.A. He said that the reliance to be placed upon observations made with measuring instruments evidently depends primarily upon the accuracy with which these instruments record. Neglect of this fundamental truth often leads to inaccurate and erroneous deductions from experiments which are themselves of the highest scientific value; not infrequently the whole value of observations may be destroyed by insufficient care in the calibration of the instruments used. The subject is therefore one of some importance. The author describes the chief sources of error in some of the most common engineering investigations and their probable value, and points out some of the possible methods of correction where such exist. For example, in engine trials there are many possible sources of error. Most of these may be reduced in percentage value by continuing the trial for a sufficient period. But this is not the case with errors which may occur in the indicators, gauges or spring balances used in the determination of power. In these, unless properly calibrated before trial, very serious errors may be introduced, amounting in some cases to 5 and 6 per cent. of the total power indicated. It is therefore absurd, even if proper precautions have been taken, to rely upon horse-power measurements to two places of decimals.

Similarly with regard to tension and compression experiments with standard 10-inch bars. Here calibration of the testing machine is extremely difficult, and can in general only be carried out over a small portion of the experiments. Deductions have, therefore, to be made from the less to the greater, with the result that small errors in the calibration will tend to be magnified. Vertical testing machines have fewer sources of error, and can be calibrated with more certainty than horizontal machines. Extensometers are, however, much more easily applied to a horizontal bar than a vertical, and variable jockey weights, which are requisite if the same accuracy is to be maintained at low loads as at high, are also more readily adapted to horizontal machines.

Extensometers can be made and calibrated well up to the accuracy of the testing machine. With standard bars and a measuring instrument true to the ten-thousandth of an inch, the modulus can be relied upon to the second significant figure. It is doubtful if more can be obtained without very special construction and calibration of the testing machine.

The difficulty in bending experiments again lies in the accurate application of load. Unless the beams are very short or of unmanageable cross-sections, the load measurement must be very delicate if readings approaching the accuracy of those in tension are to be obtained. It is possible that some of the discrepancies in published beam experiments may be due to this cause.

THE BUILDING TRADE IN GLASGOW.

WHILE, in consequence of the coal strike and from other causes, the majority of industrial trades in Glasgow are at present quiet, this is not the case with the building trade, says the *Glasgow Herald*, in which the operative masons and stone-cutters are fully employed, and it is estimated that from 500 to 600 additional masons and builders could easily find employment in the city. Notwithstanding the depression in other trades, master masons have been short of men for a considerable time now, and there is a standing difficulty in procuring a sufficient number of tradesmen to carry on the various works in process of erection so as to fulfil contracts. Besides a large number of tenement buildings, there is unusual briskness in erecting handsome structures in the city, which gives steady employment to a considerable body of the men. An excellent arrangement which prevails between the employers and operatives is that there is an annual conference held in April, which fixes the standard wages for the year. It works well, and the present standard is $8\frac{1}{2}$ d. per hour. Those conferences have existed for the last ten years, during which time there has been no friction, either in respect of wages or of the conditions of employment. There are said to be large numbers of men in the South who cannot get employment; and even in the United States, where it is customary for many of our countrymen to seek employment in summer, returning to their homes in winter, the building trade is in a depressed state. Notwithstanding the great increase of the city, it is said that in 1874 and 1875 there were more masons, builders and hewers than there are at present.

HYGIENE OF SCHOOLS.

At the Sanitary Congress, Glasgow, Dr. Glaister read a paper on "School Hygiene," in which he discussed school space and its relations to the health of scholars and teachers. That subject lay at the foundation of the health requirements of school life, and involved some of the nicest and most important problems of sanitary science. Under the Education Act, the amount of superficial floor space required per scholar was 8 square feet and the cubic space per scholar 80 cubic feet. No allowance was made for the difference of the age and bulk of individual scholars; that was to say, the advanced pupils in one room had the same average amount of space as the

infants had. Under the new code, however, a somewhat more liberal average was laid down. The floor space was increased to 10 square feet per scholar and the cubic space to 100 feet. Having discussed the subject at some length, he observed that it seemed to him that the first point to be insisted upon was (1) an increase of school space per child to the extent that for each child there should be an average of 18 square feet of superficial floor space, with a ceiling not more than 14 feet in height, giving, approximately, 250 cubic feet per child; (2) the above school space should be accompanied by such special provision for ventilation as would not operate prejudicially on the scholars. Alternatively with mechanical ventilation smaller school spaces than the foregoing could be adopted, viz. 12 square feet floor space, with a ceiling not more than 14 feet high, giving 168 cubic feet per scholar, would be adequate; but 14 square feet floor space, with same height of ceiling, giving 196 cubic feet per scholar, would be much better. It appeared to him that the time was now ripe for a reconsideration of school spaces. While we had been advancing in our demand for cubic space for adults, we had been practically standing still in this direction for children, and surely the health of the coming generation was as important as that of the present adult population. If the State insisted on the compulsory education of every child, it ought to be the business of the State to see that, during the progress of that education, children should be placed in the best possible hygienic surroundings. He was not concerned respecting the economic aspect of the question, for he believed that, in the improved condition of the children, in the decrease of the death-rate of the children that would ensue, and the better protection of our children against epidemic and other diseases, the ratepayers of the country would be amply repaid, and that healthier men and women, and more of them, would be reared for the country's good.

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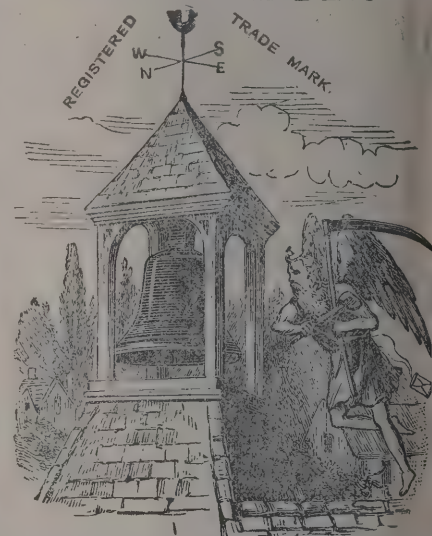
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safety valve and one $\frac{3}{4}$ -inch double lever safety valve. The boilers are fired by Vicar's mechanical stokers with movable fire bars. The stokers can be adjusted both in the hopper feed and in travel of fire bars to meet the irregular demands for steam which the installation has to meet. These stokers convert the firegrates of the boilers into a kind of gas furnace; all smoke is consumed. The mechanical stokers have been an unqualified success; the coal used is screened small, and excellent working results have been obtained. During the coal strike about two years ago the Melbourne Power Company were compelled to resort to the use of coal slack and breeze, which with similar mechanical stokers gave satisfactory results, though at the time they were short of boiler power. The combustion is perfect, the residue from furnaces being thoroughly spent. If the advantages of the mechanical stokers were better known they would be more generally adopted. Two mains leave the pumping station in Pier Street running in the same line until Sussex Street is reached, in Liverpool Street. At this point the mains diverge, one following Sussex Street to Market Street. At Market Street a circuit is formed by connecting the Sussex Street main and the main in Pitt Street. From Market Street 6-inch mains are continued through Pitt and George Streets, connecting again at Bridge Street. From Market Street a 6-inch main is continued through Kent Street to Miller's Point, continuing along Windmill Street with the intention of joining the Pitt Street main at Circular Quay. Smaller circuits of 4-inch and 3-inch mains have been laid around many of the city blocks, connecting at two points with the trunk mains. Stop valves are provided on the mains at about 300 yards apart, and also at the junction of all sub-mains, so that any section can be isolated if necessary. Should a fracture of the main occur, the stoppage is limited to the time occupied in shutting down the valves at each end of the section on which the break takes place. There have only been two breaks on the mains since the company commenced to supply power, one occurring at night on a branch main causing no stoppage. The second break brought down the accumulators; in fifteen minutes the section was cut off, and pressure restored throughout the system. The time occupied in reinstating a broken pipe is about four hours. All pipes, bends and tees are of standard lengths, and tested, when manufactured, to 2,500 lbs. per square inch. After being laid a further test of 15,000 lbs. per square inch is made to test the joints before filling in the trench in which the pipes are laid.

Air-cocks are fixed at all high points in the mains through which the air is displaced in charging the mains. Tee-pieces for 2, 3 and 4-inch branches are placed at convenient points on the line of mains, from which service-pipes can be carried to the consumers' premises when required. In making a connection to the consumers' premises a stop-valve is provided on the main at a point near the building; also a back pressure or non-return valve is fixed near the machine. Should a pipe or main break, the non-return valve is closed by the pressure on the top side of valve, and the water is thus prevented from leaving the cylinder, and the car or load from making a rapid descent. Owing to the nature of the Sydney streets, the mains have been laid underneath the footways; this has many advantages—being near the building line a shorter and cheaper connection can be effected, and obviates any necessity for disturbing the wood-blocking in the streets and the consequent expensive reinstatement. Repairs are also much easier carried out. The total length of pressure-mains laid up to date is 21,120 yards, equal to 12 miles; about 2,640 yards of return mains on the watershed to the works, where the water would return by gravitation, without exerting a back pressure on the consumers' machinery. After the water supply from Waterloo was decided on, any further extension of return-mains was discontinued. I omitted to mention the mains also extend on the Pyrmont side of Darling Harbour to Pyrmont Bridge road; power is being supplied to 19 cranes, and also to the wool stores of Messrs. Goldsborough & Co. and Messrs. F. L. Barker & Co.

The water for the power-supply is obtained from two sources; operations at first were commenced with a connection from the city water-supply, a 6-inch connection being laid to the storage-tanks at the works, but an initial cost of 1s. 6d. per 1,000 gallons, and even at the reduced rate of 1s. per 1,000, was a serious drawback in supplying the power at a reasonably cheap rate to large consumers. Steps were therefore taken to secure if possible a cheaper water-supply. With this in view 10 acres of land lying between Mount Rennie and Waterloo at the foot of the sand hills was secured on a long lease. A storage-dam was excavated of 750,000 gallons capacity, which has since been increased to about 1,000,000 gallons. A small pumping-station was erected and equipped with one set of Worthington pumping-engines (compound condensing) equal to raising 25,000 gallons per hour, together with the necessary boiler-power. The Waterloo station is connected to Pier Street by $2\frac{1}{2}$ miles of 9-inch and 6-inch main, $1\frac{1}{2}$ miles from Waterloo



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PROOFS of this Illustration, which appeared in "The Architect" on June 6, 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

being 9 inches in diameter. This is the rising portion of the main, and brings the water over the highest point in Redfern, after which the water reaches the central pumping-station by gravitation through 1 mile of 6-inch main. The water is delivered to large storage-tanks at the pumping-station. These tanks form the roof over engine-house, and measure 50 feet by 40 feet by 8 feet deep, equal to 100,000 gallons; the tank is divided into two compartments, the water being delivered and allowed to settle in the first, after which it overflows to the second section of the tank; the water then is supplied to the pumping-engines, the supply-pipes to pumps being in duplicate. The hydraulic power-water is sold by meter, the charges being based on a sliding scale, commencing with a minimum charge of 3d. per quarter, for which sum 5,000 gallons is supplied. Where the consumption reaches 275,000 gallons per quarter, the charge is 5s. per 1,000 gallons, and where the consumption reaches 300,000 gallons a special rate is given. Water is now being supplied in Sydney to large consumers at 4s. 2d. per 1,000 gallons. The principal use of the power is for intermittent work in cases where direct pressure can be employed, as, for instance, passenger lifts, warehouse hoists, cranes, presses, &c. For such purposes hydraulic power has long been recognised as being the best and most trustworthy. It is not, therefore, surprising to find that the hydraulic power companies in Sydney and elsewhere have secured so large a share of the lifting work. In all cities where public hydraulic supply has been introduced it has proved more convenient and satisfactory than any private system of power supply, and the sliding scale of charges adopted has brought it within the reach of both large and small consumers with advantage to both. Circumstances differ so widely that it is not perhaps possible to make any general statement as to the economy of hydraulic power over older systems, but in many cases the owners of lifting plant have found the saving sufficient to pay the cost of the new hydraulic machinery substituted for steam or other plant in three or four years. In Sydney the use of private installations of power-producing plant have in many instances been discontinued. To my knowledge, not less than twenty-five gas-engines, representing 175 horse-power, have been supplanted by the Public Power Supply. The 175 horse-power quoted was used for the running of thirty-eight lifts, or an average of 4.6 horse-power each. Taking, say, 200 lifts, the number now connected to the supply mains, and allowing 4.6 horse-power for each, the total required would be 920 horse-power, whereas the horse-power indicated

at the works is about 105 during the busiest hours of the day; this illustrates the economy derived from averaging the requirements of individual consumers. The result of working a large number of machines from one central station reduces the consumption of each to a common average, though a considerable variation in the demand for power exists at different hours of the day. Assuming that the 200 machines at present running consume, say, 4 horse-power each, 800 horse-power would be required, but in actual work we find that the average maximum demand is $\frac{1}{2}$ horse-power per machine as indicated at the station, the maximum output being from 12,000 to 13,000 gallons per hour. The machinery connected to the system comprises the following:—Passenger and goods lifts, 149; whip hoists, 22; dumping presses, 7; cranes, 20; motors, 3; total, 201. One of the most important points in the distribution of the power is the necessity of the perfectly sound condition and integrity of the mains—the velocity of water at 700 lbs. pressure through a free orifice being 320 feet per second, a very small hole is required to pass a great body of water. Any abnormal increase in the output is evident during the night, if due to leakage, as the demand during about four hours is very low. The number of gallons delivered to the mains is indicated by the counters fitted to each engine. Should any unaccounted for increase occur each section of the main is cut off during the night, each valve being closed at intervals of fifteen minutes, readings of the counters being taken at the same time at the station. When the section on which the leak occurs is cut off, the revolutions of the engine at once indicate the leak, which, after being located to a particular section, is soon discovered. The meters used for measuring the power to consumers are of various types, viz. Parkinson's fan meter, Siemen's, Kent's positive meter, and Tylor's. The water has hitherto, in nearly all cases, been measured on the exhaust side of the machines. High-pressure meters of the Kent's positive type and Tylor's turbine system have been introduced with good results; these meters in construction are identical with the low pressure, the casting only being strengthened to withstand the higher pressure. Another class consists of piston meters, as the Schoneyder; in these, the water passing through a cylinder or cylinders actuates a piston which in turn is geared to an index and records the volume that is passed. The Parkinson type of meter is based on the principle that is employed for gas meters, the water being admitted on one side of a drum, which is divided into compartments. The drum is caused to rotate by



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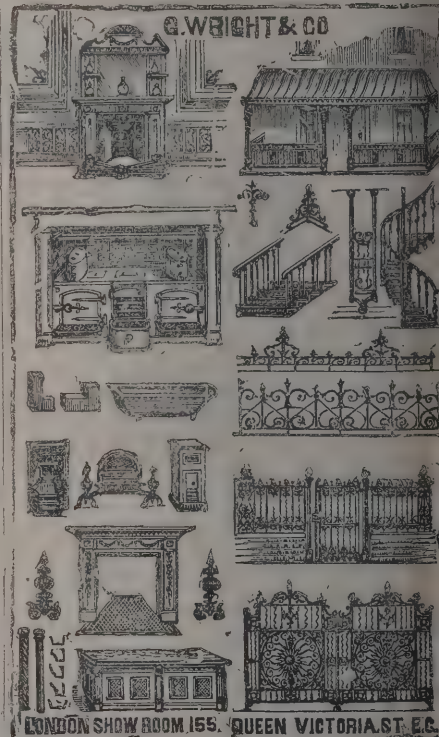
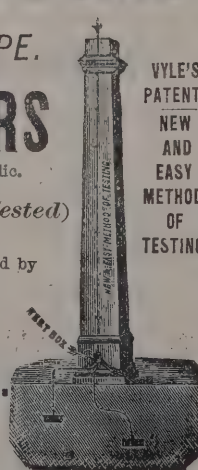
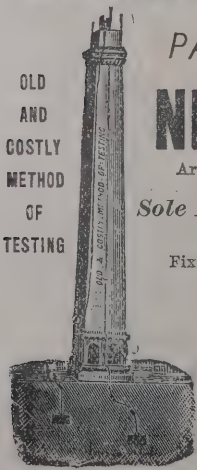
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the entry of the water which passes through it to the delivery of the quantity of water; thus each compartment being known the volume that is passed by each revolution is recorded on the dial. Kent's positive meters have also been used on the high-pressure side of the machine with very satisfactory results. The efficiency of the meters and condition of the mains is tested or checked by counters on the pumping-engines, such reading being multiplied by a constant representing the capacity of the pumps per revolution, less the 5 per cent. allowed for slip. A great advance has been made during the last few years in the class of lifts and hoists used in conjunction with hydraulic power. Sydney is in no way behind in this respect—in fact, I have no hesitation in saying that we have in this city some examples of hydraulic lifts not equalled in any part of the world, notably the direct-acting hydraulic passenger-lifts at the Hotel Australia, the Government Lands and Works Offices, the Mutual Life Association, and the latest installation at Messrs. Anthony Horden & Son's new premises, all of which have been designed by Mr. Norman Selfe, the inventor and patentee. We have also some very complete and perfect examples of the suspended hydraulic lift as supplied and erected by the Waygood Elevator Company and other makers. For economy of water for work done the suspended elevator, if properly balanced, stands first; the balancing of the lifts is carried out even to compensating for the weight of ropes when the lift is at the bottom limit of travel. I have not seen this applied in Sydney, but it is in general use in Melbourne where the buildings are much higher, and the weight of lifting ropes correspondingly greater; all these improvements have added to the efficiency of the modern elevator. Evidently we have not yet reached anything near perfection, for we have now running in Sydney a multiple power lift known as Carey's patent, introduced by the Waygood Company, for which excellent results are claimed. Three cylinders are placed side by side, with rams to each of equal diameter; the rams are inserted and fixed to one common crosshead; the three powers are controlled by an automatic valve which adjusts itself to the load placed in the car; should the load be under the limit of first power the pressure is admitted to the centre cylinder, the outer cylinders being filled from an overhead tank to which the exhaust water is delivered; if the second power is required the pressure-water is admitted automatically to the two outside cylinders and water from tank to centre cylinder; should the third or full power of lift be required, pressure is admitted to all three cylinders. The automatic working valve is controlled by

a governor arrangement which prevents the valve moving further over than the power required. The dream of all lift-makers is the ideal lift that will consume water in proportion to load raised. The driven machinery is of as great importance to an economical and satisfactory result as the distributing plant, but this fact does not receive the attention it deserves. Regulations are issued by power companies defining the conditions to be observed by manufacturers in fitting up machinery for connection to the system. These regulations are given in order to secure safety and efficient registration of the quantity of power used; but the score of economy and efficiency of the machines is left to be settled between the makers and the consumer. Outside of the operations of the power company we have in New South Wales several extensive installations of hydraulic power on the high-pressure system, the most important being at Newcastle, where the system has been adopted for the shipment of coal, the capacity of the pumping-station being nearly equal to that of the power company described before. In Sydney we have the installation at the Hotel Australia, also at Messrs. A. Horden & Son's, Lamb's Wharf, Miller's Point; the Pastoralists' Association, North Sydney, and the Australian Gaslight Company, where the coal is discharged from the colliers by quick-running hydraulic portable cranes, which can be moved to suit the hold of the vessel; two large hydraulic lifts are also in use for raising the coke, &c. from works to Kent Street level. All these installations are worthy of note. One fact forcibly presents itself to anyone who has given any attention to hydraulic appliances, viz. the absence of any wharf cranes in Sydney for the discharging of heavy weights, such as locomotive boilers and other heavy material. In Melbourne the Harbour Trust have erected several cranes, one equal to raise 25 tons; the cranes are connected and worked when required by the power company at a charge per hour when the cranes are in use. The Harbour Trust have thus all the advantages of the cranes for heavy lifts, without the standing charges which would attend any pumping station under their own control.

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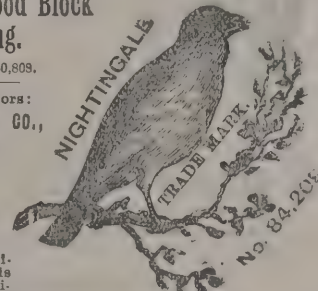
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 15447. James Hall Toote, for "Improvements in window-sash fasteners."
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 15498. Robert William McGregor, for "Improved apparatus for ventilating and other similar purposes."
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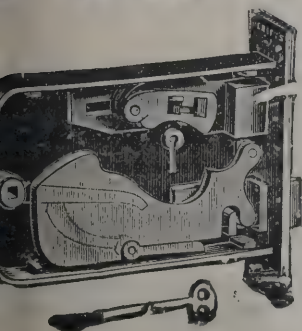
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DUNDEE.—Sept. 8.—For Mortuary at Poorhouse. The City Architect.

EDINBURGH.—Sept. 8.—For Additions to Royal High School. Mr. Wilson, Architect, 3 Queen Street, Edinburgh.

ELLESMERE.—For Building Two Infant Schools and other Works. Mr. A. E. Lloyd Oswell, Architect, Dana Chambers, Shrewsbury.

GELLIGAER.—Sept. 22.—For Extension of Board School. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

GLASGOW.—Sept. 14.—For Building Sanitary Offices. Mr. J. Lang, City Chambers, Glasgow.

GRIMSBY.—Sept. 7.—For Building Schools for St. John's Church. Mr. Herbert C. Scaping, Architect, Victoria Chambers, Grimsby.

HALIFAX.—Sept. 7.—For New Wing to National School, Norland. Mr. C. F. L. Horsfall, Architect, Lord Street Chambers, Halifax.

HALIFAX.—Sept. 27.—For Building Two Wool Warehouses. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HALIFAX.—Sept. 22.—For Building Board School for Infants. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

HARROGATE.—Sept. 7.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

HASSOCKS.—Sept. 15.—For Additions to Board Schools. Mr. Arthur Loader, Architect, 54 Old Steine, Brighton.

HORNSEY.—Sept. 17.—For the Supply of 100 or 200 Fire Hydrants and Covers. Mr. F. D. Askey, Southwood Lane, N.

IPSWICH.—Sept. 18.—For Works at Board School, Argyle Street. Mr. F. E. Bisshopp, Architect, Museum Street, Ipswich.

KILWORTH.—Sept. 8.—For Alterations to Parish Church. Mr. M. H. Hennessy, Architect, Trinity Chambers, 60 South Mall, Cork.

KING'S LYNN.—Sept. 8.—For Additions to East Anglian Hotel. Mr. E. J. Colman, Architect, King's Lynn.

LEEDS.—Sept. 17.—For Rebuilding Cardigan Arms Hotel and Old Toll Bar Hotel. Mr. Thomas Winn, Architect, 90 Albion Street, Leeds.

LEEDS.—Sept. 8.—For Brewhouse and Alterations to Pointer Inn. Mr. T. Winn, Architect, 90 Albion Street, Leeds.

LEWISHAM.—Sept. 11.—For Kerbing, Tar-paving, Metalling and Channelling Work. Mr. Edward Wright, Clerk to Local Board, Catford, S.E.

LIVERPOOL.—Sept. 18.—For Erection of Superstructure of proposed Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LLANRWST.—Sept. 7.—For Erection of Board School and Master's House. Mr. Richard James, Llanwrst.

LLWYNYPPIA.—Sept. 10.—For Building Thirty Houses. Mr. T. B. Phillips, Llwynypia.

LONDON.—For Construction of a Short Line of Railway in Suburbs and Supply of Materials. Mr. R. F. Anderson, A.M.I.C.E., Ryde, Isle of Wight.

MIDHURST.—Sept. 10.—For Sinking and Lining a Trial Bore-hole. Surveyor, Langford House, Midhurst.

NASSINGTON.—Sept. 10.—For Building Board School. Mr. Wm. Boyer, Architect, 10A Cowgate, Peterborough.

NEATH.—Sept. 8.—For Rebuilding Crown Hotel. Messrs. Lambert & Rees, Architects, Bridgend.

NEWBOLD.—Sept. 11.—For Building School. Mr. J. W. Fearn, 31 Devonshire Street, Chesterfield.

NEWTON ARLOSH.—Sept. 10.—For Alterations to Board School. Mr. G. D. Oliver, Architect, 5 Lowther Street, Carlisle.

NORTHALLERTON.—Sept. 13.—For Wing to Cottage Hospital. Mr. C. Hodgson Fowler, Architect, The College, Durham.

PETERBOROUGH.—Sept. 8.—For Alterations to Workhouse. Mr. J. G. Stallebrass, Architect, North Street, Peterborough.

PONTYPRIDD.—For Additions to Fairfield. Mr. T. R. Phillips, Architect, Old Bank Chambers, Pontypridd.

PORTH.—Sept. 10.—For Building Forty-five Cottages. Mr. D. W. Jones, Tynewydd Hotel, Porth.

PORTSMOUTH.—Sept. 12.—For Building Board School for 2,072 Children. Mr. A. H. Bone, Architect, Cambridge Junction, Portsmouth.

RADNOR.—Sept. 10.—For Pulling-down and Restoring Nave and Tower of St. Michael's Church, Beguildy. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

READING.—For Buildings for Central Electric Station. Mr. F. W. Albury, Architect, 154 Friar Street, Reading.

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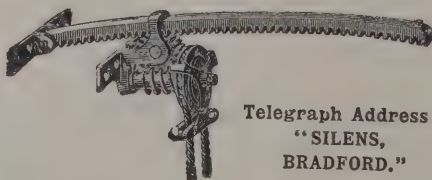
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SAXMUNDHAM.—Sept. 21.—For Building Board Schools. Mr. John Fry, Solicitor, Saxmundham.
SMETHWICK.—Sept. 14.—For the Construction of about 1,900 Yards of Brick Sewers and Conduits, and 3,700 Yards of Pipe Sewers with Manholes, Lampholes, Bell-mouths, &c. Messrs. Harris & Harris, 9 Bennett's Hill, Birmingham.
SOUTHBOROUGH.—Sept. 18.—For Erection of an Isolation Hospital. Mr. Wm. Harmer, 137 London Road, Southborough.

SOUTH CAVE.—Sept. 10.—For Building House. Mr. B. S. Jacobs, Architect, Lincoln's Inn Buildings, Bowldalley Lane, Hull.

SOUTH MOOR.—Sept. 11.—For Building Wesleyan Chapel and School. Mr. M. H. Kellett, Ivy Terrace, South Moor, Durham.

SOUTH NORMANTON.—Sept. 24.—For Building Board School for Infants. Mr. J. T. Shardlow, Architect, Blyth Road, Workson.

ST. GEORGE-IN-THE-EAST.—Sept. 21.—For Building Casual Wards, Old Gravel Lane. Messrs. Wilson, Son & Aldwinckle, Architects, 1 Victoria Street, S.W.

STRATFORD.—Sept. 8.—For Erection of a Block of Warehouses. Messrs. J. S. Newman & Jacques, 2 Fen Court, E.C.

TORQUAY.—For Erection of Holy Trinity Church. Mr. John Watson, 1 Lower Terrace, Torquay.

TURTON.—Sept. 14.—For Building Police Station. Messrs. Henry Littler & Son, Architects, 4 Chapel Walks, Manchester.

USWORTH COLLIERY.—Sept. 10.—For Additions to Schools. Mr. R. G. Cowe, Architect, Chester-le-Street.

WALSALL.—Sept. 17.—For Additions to Board School. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WALSALL.—Sept. 22.—For Building Police Station. The Borough Surveyor.

WALTHAMSTOW.—Sept. 7.—For Making-up and Laying Concrete Flags. Mr. G. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Sept. 7.—For Supplying and Fixing about 60 Rods of Oak Park Fencing. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WEST LAVINGTON, WILTS.—Sept. 10.—For Erection of School Buildings. Mr. John A. Randell, M.S.A., Exchange Place, Devizes.

WHITEHAVEN.—Sept. 8.—For Rebuilding Church. Messrs. Moffat & Bentley, Architects, 53 Church Street, Whitehaven.

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Tarran & Co., Hull	253	10	0
J. Habbershaw, Hull	242	0	0
A. Cass, Hull	240	12	6
J. Caunt, Hull	239	0	0
J. A. Gibson, Hull	237	0	0
J. M. Woods, Hull	235	10	0
A. Brown, Hull	230	0	0
H. S. DITCHBURN, Hull	217	0	0
A. Hewitt, Hull	185	9	6
H. F. Arnott, Hull	177	8	6

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W. Parker, Bexhill	710	0	0
BARKER & ROGERS, Bexhill (accepted)	699	0	0

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TOWNSEND, WATSON & GATES, Sheffield (accepted)	£1,258	3	0
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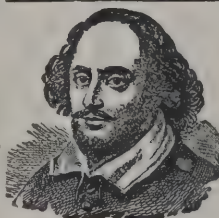
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PAYNTER & DAVEY, Plymouth (accepted) 285 10 0

PUDSEY.

For Building New Premises, Pudsey, for the London and Yorkshire Bank, Limited. Mr. C. S. NELSON, Architect, 10 Park Row, Leeds.

Accepted Tenders.

J. Moulson & Son, Bradford, mason.
Appleyard Bros., Bramley, joiner.
G. Lazenby, Leeds, plumber and glazier.
A. & S. Wheeler, Calverley, plasterer.
F. Thompson, Stanningley, slater.
J. Nicholson, Pudsey, painter.

Total, £2,360 10s.

TONYPANDY.

For Building Thirty-seven Houses for the Blaenclydach Building Club. Mr. R. S. GRIFFITHS, Architect, Town Hall Chambers, Tonymandy.
Davies & Thomas, Tonymandy £6,660 0 0
H. Games, Cilfynydd 6,105 0 0
Charles Bros., Tonymandy 6,095 15 0

WALSALL.

For Additions, &c., Queen Mary's Schools, Walsall. Messrs. BAILEY & MCCONNALL, Architects, Walsall. Quantities by Architects.

H. Willcock, Wolverhampton £4,875 0 0
R. Jones, Shelfield, Walsall 4,700 0 0
Barnsley & Sons, Birmingham 4,698 0 0
H. Lovatt, Wolverhampton 4,500 0 0
T. Rowbotham, Birmingham 4,416 0 0
W. Kendrick, Walsall 4,358 0 0
J. Bowen, Birmingham 4,300 0 0
J. Lynex, Walsall 4,239 0 0
Harley & Son, Smethwick 4,228 0 0
J. Mallin, West Bromwich 4,195 0 0
W. Winstance, Walsall 4,086 0 0
W. & J. Webb, Birmingham 4,084 0 0
W. Hopkins, Birmingham 4,072 0 0
Guest & Son, Stourbridge 3,958 0 0
R. M. HUGHES, Birmingham (accepted) 3,921 0 0

UPPER SKETTY.

For Dwelling-house and Stables at Upper Sketty, near Swansea. Mr. BUCKNALL, Architect, 97 Oxford Street, Swansea.

Evans & John, Brynhyfryd £1,570 0 0
T. Walters, Swansea 1,418 0 0
J. D. Williams, Knighton 1,350 0 0
T. Watkins & Co., Swansea 1,332 0 0
H. Billings, Swansea 1,312 0 0
Bennett Bros, Swansea 1,302 0 0
J. Tucker, Swansea 1,208 0 0
A. W. Llewellyn, Sketty 1,200 0 0

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For Addition to Clifton Cottage, Cleveland Road, South Woodford, Essex. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, King William Street, London, E.C.

W. MUNDY (accepted) £252 0 0

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A. Kellett 15,925 14 11
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It has been decided to apply for sanction to obtain a loan of 6,050l. for carrying out the new sewer at Faversham, the balance of the cost to be met out of the district fund.

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See Illustrated Advt. page

TRADE NOTES.

MR. ROBERT W. STEWART, of Tenter Street, Goodman's Fields, is introducing a new pigment which, when better known, should command an extensive sale. This colour, which for brilliancy compares with genuine vermilion, of which it is only one-fourth of the price, possesses fineness, body and durability, and it can be applied in oil or varnish to either inside or outside work. Another novelty, of which Mr. Stewart is making a specialty, is his Scotch soap powder or crystallised soap, which is specially manufactured for washing town paint and varnish work. It possesses the merits of being cheap, very portable, effective, clean and easily applied. It does not, moreover, leave a greasy surface or injure the work.

THE extensions to the Llanelly Hospital, which are nearing completion, are being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves with descending smoke flues, and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Hendon Local Board having decided, on the recommendation of their surveyor, to test the practicability of using Rutty's patent macadam road scarifier, to be worked by their own steam-roller, thus employing their own plant and labour, a machine has been sent to them, and is now being worked in the Edgware Road with satisfactory results, 500 yards super per hour being easily scarified; an ordinary draw-bar affixed to their roller has been found sufficient to enable them to use the scarifier.

VARIETIES.

IT is estimated that in the forests on the western district of Minnesota, which were exposed to the recent fires, there were 150,000,000 pine trees. The Diamond Match Company owned two-thirds of them. The timber which remains will have to be cut this year.

THE new City of London School for Girls, which has been erected in Carmelite Street at a cost of 20,000*l.*, will be opened on Thursday next.

ABOUT 14,000*l.* have been spent by the Corporation of London in building new offices at Guildhall and generally improving the accommodation for the staff of officers. The work, which has included the building of new quarters for the town clerk's, chamberlain's and surveyor's staffs, has extended

over two years. A sum of 200 guineas has also been expended in fitting the main entrance with new oaken doors, which have been designed by Mr. A. Murray, the surveyor to the Corporation. They are of fifteenth century style.

THE *Glasgow Herald* says:—Having regard to the number of applications for linings which continue to come before the Dean of Guild Court, the boom in building in Glasgow shows no sign of slackening. At the last sitting of the court, leave was given to erect no fewer than nine new tenements of dwelling-houses in different parts of the city, whilst the Central Drill Hall Company (practically the 5th Lanark Rifles) were authorised to proceed with a drill hall, armoury and headquarters in Garnethill, and the trustees of the Savings Bank of Glasgow to put up new buildings at the corner of Ingram and Glassford Streets. Numerous applications of a minor character were also granted.

THE licensing magistrates at Aberystwyth have granted two licenses for an hotel and park and cliff gardens and pavilion, to be erected by Mr. Grant, of London, at a cost of 20,000*l.*

THE death is announced of Mr. William Chalk, who has for the last thirty years been prominently identified with the iron trade of Lancashire, at his residence in Birkdale, Southport. Managing partner for Messrs. Thompson & Co., iron merchants, Manchester and Wigan, all his business life has been connected with the iron industry of the country. He filled many public offices in Wigan and the district, and was deservedly respected. He was fifty-three years of age, and his death will be regretted by a large circle of friends.

AN appeal has been issued on behalf of the buildings extension scheme of Aberdeen University. The total expenditure is expected to be 140,000*l.* The subscriptions already received, including 10,000*l.* from the Town Council and 20,000*l.* from Dr. Mitchell, Newcastle, amount to 50,219*l.*, and the Government grant to 40,000*l.*, leaving to be raised in round figures 50,000*l.*

ATTEMPTS to settle the disputes with the stonemasons and plumbers of Bolton having failed, the Bolton Master Builders' Association decided to lock out all the operatives in the building trades. Over a thousand men are affected.

THE Glasgow Corporation Water Committee are nearly prepared to supply hydraulic power for hoists and other purposes. It is expected that this will be on or about the beginning of the new year. The price of the power, it is said, will not be so much as that charged by the London hydraulic companies.



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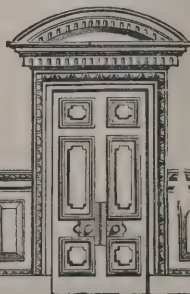
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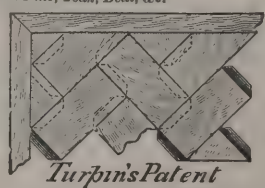
Turpin's Patent.
5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

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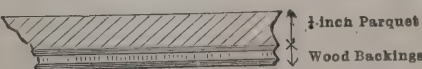


WOOD CARVING.

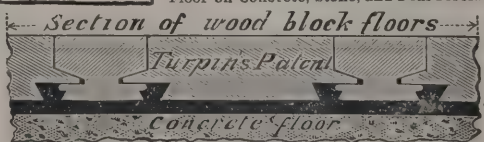
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Section of wood block floors
Turpin's Patent
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AT the meeting of the Docks and Pilotage Committee of Aberdeen Harbour Board it was decided to recommend the Board to extend the wharf on Regent Quay (Upper Dock) by 410 feet, and to erect a shed 22 feet in length by 35 feet in width. The estimated cost is 5,227*l*. The wharf on the south side of the basin will also be extended by 260 feet.

AT the meeting of the sewage committee of Glasgow Police Commissioners approval was given to a scheme prepared by Mr. McDonald, the city engineer, for the erection of sewage purification works at Dalmuir, similar to those at Dalmarnock, for dealing with that part of the sewage of the city on the north bank of the Clyde not touched by the east-end works. The scheme proposes that the greater part of the drainage area to be dealt with, covering 4,500 acres, shall be carried in a gravitation sewer, without pumping, to the Corporation lands at Dalmuir and there purified; it is also proposed that the lower levels of Glasgow and Partick, extending within the city boundary to 800 acres, should be pumped into an outfall sewer at a station on the Kelvin.

AT Egremont an inquiry has been held by the Local Government Board into an application by the Wallasey Local Board for powers to borrow 25,000*l*. for the purpose of building ferryboats. It was explained that the new boats had become necessary owing to the increased population of the district, and because of the opening at an early date of a branch of the Wirral Railway to Seacombe.

It is understood that Mr. Hugh Brown has been nominated next Glasgow Lord Dean of Guild.

THE Dereham Local Board have applied to the Local Government Board for sanction to borrow 1,100*l*. for the purposes of a new pig market.

AT the meeting of the Stockport and District Board of Guardians, an intimation was received from the Local Government Board to the effect that on the return of certain forms properly filled up an order will be issued enabling the Guardians to purchase a site near Hazel Grove for the erection of a new workhouse, the cost being about 6,200*l*.

THE Eccles Town Council propose to apply to the Local Government Board for power to borrow money for the provision of a town's yard for the borough. Plans have been prepared by the surveyor, Mr. A. C. Turley, C.E., and the work is estimated to cost about 7,000*l*. Provision is made in the plans for the custody of three fire-engines (two steam and one manual), stabling for twenty-three horses, &c.

THE Liverpool authorities have received notice to the effect that the Home Office has agreed to the purchase of the Kirkdale Gaol site by the Corporation for the sum of 17,650*l*. Thus a populous part of the city will in the near future be in possession of a valuable recreation ground.

THE Tonbridge Gas Company have, in consequence of the rapidly-increasing consumption of gas, decided to make extensions, including a new large gasometer, three new branches of retorts and a new coal store, the estimated cost being 7,000*l*., with the purchase of two acres of land.

AT the meeting of the Manchester City Council, Sir John Harwood mentioned that the Thirlmere lake was now filled up to the 20-foot level, and the water was running over in St. John's Beck. The committee had not thought that they would be able to open the works until April next; but matters were in such an advanced state that they proposed that the Prince of Wales should be asked to perform the ceremony next month.

ELECTRICAL.

AT the meeting of the gas and electric committee of the Glasgow Town Council, it was agreed that the price of gas should remain at 2*s* 6*d*. per 1,000 cubic feet, and that the price of electric light should be continued at 6*d*. per Board of Trade unit, being the price to which it was reduced from 7*d*. some time ago.

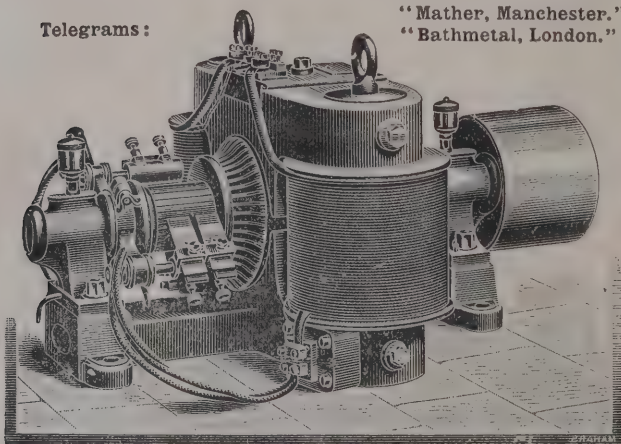
AT the meeting of the Worcester watch committee the sub-committee reported having received a number of applications for the electric light. The applications acceded to included several churches, and it was stated that the dean was anxious to have it put in the cathedral. It was decided to recommend the Council to vote a sum of 1,000*l*. as working capital to pay the cost of such extensions as the committee might decide were necessary.

AT Wolverhampton it is proposed to introduce the electric light in Walsall Street new Board school, at a cost of 233*l*.

THE *Scotsman* says:—By way of experiment, Nicolson Square, Edinburgh, has just been fitted up, at the instance of the Town Council, with incandescent gas-burners, which were lighted last night for the first time. There are four lamps along the front of the square and five on the two side streets, or nine in all. The burners used for outdoor lighting are about twice the size of those fitted in shop windows. The mantle is

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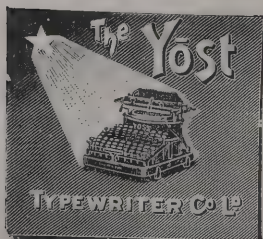
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larger and stronger, and there is a bulb globe and metal top. Each of the large burners consumes $3\frac{1}{4}$ cubic feet of gas per hour, or about a foot more than the burner in the ordinary street lamp, and the light given out is estimated to be equal to 75 candles. Under the influence of this light the square—usually very dark—had a more cheerful appearance. One of the lamps did not burn well, but it was explained that that was owing to the fact that a larger quantity of gas was passing through the pipe than could be consumed. Though the night was rainy the installation attracted a good deal of notice. When the Council go to see the lamps they will have a ready means of comparison between the incandescent light and the electric light by a reference to the electric lamps over the door of the Empire Theatre adjoining.

HEATING POWER OF SMOKE.

MR. R. R. TATLOCK, dating from the City Analyst's and Gas Examiner's Laboratory, Glasgow, says:—It appears to be generally understood that a large percentage of fuel is lost in the smoke which issues so abundantly from most chimneys, and random statements have been made to the effect that the loss in heating power due to this passing away of combustible matters in smoky furnace gases may reach as high as 30 per cent. of the whole. A little consideration, however, will show that the loss of any large percentage of combustible matter, and consequently of heating power, is quite out of the question. This may be proved in two ways (1) by calculation of the two sources of heating power as shown by an analysis of coal or dross used for steam raising; and (2) by actual analysis of the furnace gases for combustible solids and gases. Annexed are the results of these two methods of observation, the same dross being analysed and also employed as fuel in a works furnace, from which smoky gases were given off which were tested for combustible purposes.

Mr. Tatlock goes on to say that the points to be observed are the relative proportions of heating power (represented in the analysis by the number of pounds of water at 212 deg. F. capable of being evaporated to dryness by 1 lb. of the fuel) given out respectively by the combustion of gas, tar, &c., and by fixed carbon. These are calculated according to Playfair's well-known formula, which was practically tested on coals intended for the British navy, and which shows that while 1 lb. of fixed carbon is capable, when burned, of evaporating 13 lbs.

of water at 212 deg. F. to dryness, 1 lb. of the gas, tar, &c., will only evaporate $3\frac{1}{4}$ lbs. From these figures it appears that in this coal or dross the gas, tar, &c., only contributes 15 per cent. of the total heat given out during the combustion, and that the fixed carbon produces the remainder, or 85 per cent. In coals with less of the former ingredients and more of the latter, which is commonly the case, the proportion given out by the volatile constituents would be considerably reduced. It is thus perfectly clear that even though the whole of the volatile matters (which can alone be accountable for any loss of combustible material) escaped combustion, there could not possibly be a greater loss of heat than 15 per cent. of the whole, even in such an extreme case as this represents.

The analysis was made of the furnace gases given off during the burning of the dross is also recorded. It has been asserted that carbonic oxide is given off in considerable quantity when much smoke is being produced, but it does not appear in this case, and Hempel in his work on "Gas Analysis" comes to the conclusion that little or no combustible gases are present in furnace gases. In the volume referred to (page 205) Hempel says: "Furnace gases usually contain only carbon dioxide, oxygen and nitrogen. All other gases are present in but very small amounts. In oft-repeated analyses the author has always found only traces of carbon monoxide, methane and the heavy hydrocarbons." This is in complete accord with the analyses given above, and it may be taken for granted that the presence of carbonic oxide or other combustible gases in furnace gases is a most unusual occurrence. This is quite conclusive evidence that no appreciable loss of heat, even when the furnace gases are smoky, can be attributed to the passing away of the products of imperfect combustion, in the gaseous form at least.

That there is loss of combustible matter in the smoke is an undoubted fact, but the quantity seems also to be greatly magnified in certain random statements. In the experiment made the soot collected consisted largely of mineral or incombustible matter. In several experiments to estimate the soot in furnace gases similar results to these were obtained. To find how much carbonaceous matter was actually lost as smoke, it will be necessary to know the number of cubic feet of furnace gases given off by the combustion of, say, 1 ton of the dross. If the percentage of carbonic acid in the furnace gases is taken at 5 per cent., the total volume of these given off from 1 ton dross would be about 940,000 cubic feet measured at the ordinary temperature and pressure, and this would contain

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41 lbs. of carbonaceous matter and 27 lbs. of mineral matter. This would represent 1·83 per cent. of the volatile matters (gas, tar, &c.) given in the analysis of the dross, and if from this is now calculated the heating power according to Playfair's formula, it will only come to 0·057. This figure, compared with the practical heating power (7·75) of the dross, goes to show that the solid combustible matter of the smoke can only account for the very small percentage of 0·74 of the total heating power which can be obtained from the coal.

From the results of these experiments it is evident that the loss of combustible matters in smoke is very small indeed, and that the belief in immense loss by this cause is simply a fallacy, and is decidedly not corroborated by experiment. In adopting methods of removing the smoke nuisance, it must, therefore, be borne in mind that there is little or no gain in burning smoke.

ROUTINE IN CHICAGO.

To the inexperienced property owner who desires to get a permit for the erection of his building in the building department of the City Hall, Chicago, the task before him, says Mr. Francis J. Norton, is a difficult one. He is obliged to present his plans and drawings to no less than a dozen experts before the official stamp of the building commissioner is put upon them. It is a common occurrence to see two-thirds of the plans submitted for inspection in the building department rejected. Why should there be such a great number of high-salaried employes, at the expense of the public, inspecting the plans in question? Why should such a state of affairs exist in this great metropolis of the West? Why not insist on a recognised status for the architectural profession, and license architects same as the medical and legal professions, and insist that plans submitted to the building department of the city of Chicago should be attested by the signature of a professional architect licensed and qualified to draw them? Assuming that the public would be obliged to pay a few dozen high-salaried officers to examine the death certificates presented by the public from doctors, or to have experts looking over the documents filed by lawyers, or the opinions they give their clients, what a howl the public would make. Yet such is the neglected state of affairs in the building departments and the architectural professions in Chicago. No doctor, no lawyer will assert that the medical and legal professions are not in a higher standing, both before the public and among themselves,

than if the entrance to their professions were without restrictions, same as thirty years ago, when Massachusetts, Indiana, Ohio, New York and other States passed laws prohibiting lawyers or doctors practising without a strict examination. Architecture should be the next profession to insist on a recognised status and a legal qualification.

THE TEREDO NAVALIS IN BOSTON HARBOUR.

At a late meeting of the Boston Society of Civil Engineers Mr. Henry Manley said:—The Eastern Dredging Company has two large scows built last season of pine, which were brought to Boston, where they were measured. They were taken down to the mouth of the harbour, beyond Boston Light, on or about May 27, for dredging, and were used there during the summer. In October or early in November they began to leak, but by that time the owners had begun to suspect that something serious was the matter, and the one in the worst condition was brought up the harbour. It was found pretty thoroughly bored through by teredo navalis, and had to be practically replanked. Another scow was then brought up, and was found riddled through, though not so badly, by the teredo. The teredo has for a long time existed on the southern coast of New England; but the harbour, on account of the difference in the temperature of the water, was supposed to be exempt. This case is almost the first in which they have been found so far north, and is the first in which they have done any appreciable harm. There are some curious features in the life and nature of the teredo. The full-grown animal sometimes attains a length of 2 or 3 feet. It enters the wood through a very small hole, and after that passes its life inside, penetrating the wood as it grows, but living in one sense a solitary life, as the openings never communicate with each other. The eggs are formed in the interior of the animal in position, and are fertilised there. They are hatched in the water. While the animal is in the water it passes through two or three different stages of growth, in each of which it assumes a different form. In one stage it is able to swim. In a later stage it has a foot that enables it to cling to any object and to move about to a limited extent. It enters the wood when about as large as the head of a pin. After it makes its entrance into the wood its progress is quite rapid. The 4 or 5-inch plank shown has been torn to pieces during one summer. The teredo does not eat the wood, but simply bores it out for a habitation. It has two flues or

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NO SMOKE, SMELL, OR DIRT.

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Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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ORDINARY BURNERS, 50 calories per candle per hour.

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passages running the whole length of its body and opening out into the salt water. Through one passage it takes in the salt water with the infusoria, &c., which constitute its food, and through the other tube the chips, its own excreta and everything else it wishes to get rid of are passed out into the water. The animal is technically a bivalvular mollusc. Its boring apparatus is a very curious one. The two large shells are not firmly hinged together. Indeed, in the specimen shown they seem to be quite loose from each other, but judging from the amount of work it can do in one season they must, in the living animal, be connected by very powerful muscles. The instance recorded may be an isolated one, or it may be the beginning of a terrible pest that will cause great trouble for all time to come to those who have charge of submarine woodwork in Boston harbour. Among the preventives in common use, covering with copper and creosoting are the most effectual. Creosoting is valuable only for a certain number of years.

WHITWORTH SCHOLARSHIPS.

THE following is a list of candidates successful in the competition for the Whitworth Scholarships and Exhibitions, 1894 :—

SCHOLARSHIPS (tenable for three years).—John Ball, James I. Smith, Harry Verney, Charles F. Smith, 150*l.* a year each.

EXHIBITIONS (tenable for one year).—Frank Fisher, William M. Thornton, John W. Hinchley, William D. Young, Alexander L. Mellanby, William T. F. Trunchion, Henry Deanesly, William T. Swinger, Arthur W. Ashton, Arthur E. Mascall, William Rosbotham, Joseph J. Kirwin, Charlie W. Cairns, John W. Button, Sydney Eraut, Charles E. Pickles, Richard G. Allen, Alexander Craig, Thomas S. Usherwood, Walter Eraut, Lewis E. Limming, Sidney E. Lamb, Francis J. Russell, Edgar R. Sutcliffe, George F. Hambly, William Gore, Thomas S. Cockrill, William H. James, Henry J. Peachey, James N. Boot, 50*l.* each.

ARCHITECTS AS TOWN COUNCILLORS.

AT the meeting of the Eastbourne Town Council on Monday the following conversation, according to the *Sussex Daily News*, formed part of the business.

Councillor Foran asked whether, on plans being passed

subject to the condition that a building would not be occupied as a dwelling-house, it was anybody's duty, and if so whose, to see that the undertaking was carried out ; and, further, whether the undertaking was always strictly carried out ?

Councillor Towner replied that it would be the duty of the building surveyor to see that the condition was carried out, but he was afraid it was not always strictly adhered to, because he knew that from time to time places had been inspected and reported upon without any action being taken upon the report. He would, however, bring the question before the buildings committee at their next meeting.

When the minutes of the buildings committee came up for consideration, Councillor Towner called attention to the fact that some plans of his were passed subject to the undertaking, and said that he did not intend to give it, as although the premises were simply intended for business, if he wished to put a caretaker in he should do so.

Councillor Bennett : I rise to a point of order.

The Mayor : What is the point ?

Councillor Bennett : He is talking about his own affairs.

Councillor Towner : I cannot speak of anything better.

The Mayor : I think you are out of order.

Councillor Mitchell said he would like to take up the same subject.

The Mayor : You are out of order ; you are the architect.

Councillor Mitchell replied that he was not speaking of Councillor Towner's plans, but of Messrs. Strange & Atkinson's, who had given an undertaking that a building for which they submitted plans should not be occupied as a dwelling-house. This undertaking was simply a farce. The Town Council had just the same powers whether the undertaking was given or not.

Alderman Morrison thought it exceedingly wrong of Councillor Mitchell to suggest in the absence of Alderman Strange that anything the alderman put his hand to was a farce. Anything Alderman Strange did ought to be sacred, to say the least of it.

The appearance of Alderman Strange just at this moment drew a laugh from the Council.

Councillor Bennett raised the question of the committee's refusal to sanction Mr. Oakden's plans for the erection of shops and offices on ground adjoining No. 10 Cornfield Road, and Alderman Strange stated that an undertaking was given some time ago that the ground should always be kept as air-space.

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KITCHENERS.

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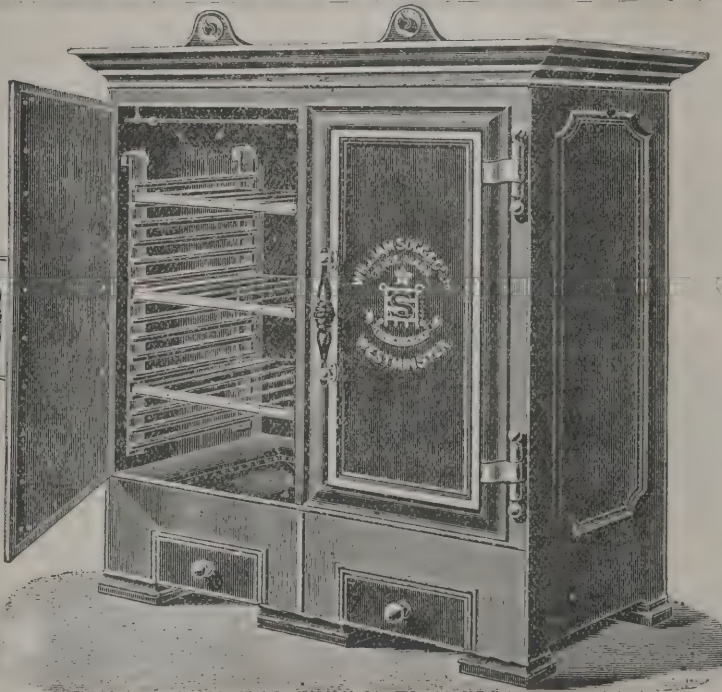
GAS OR FIRE
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GAS
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GAS, COAL OR COKE FIRES, OR STEAM.
WILLIAM SUGG & CO.

Vincent Works, Westminster, S.W.; 1 and 2 Grand Hotel Buildings, Charing Cross, W.C.;
1a Ludgate Hill, E.C.; 33 Bold Street, Liverpool, &c.

Councillor Bennett urged that the agreement between Mr. Gausden and Mr. Oakden was that shops should be built there.

Alderman Strange denied it, and Councillor Bennett characterised the alderman's denial as false, whereupon he was promptly called to order.

Alderman Homewood remarked that the undertaking seemed to be demanded in a great many cases.

Councillor Breach asked whether it would not be as well to insert the words "except to a caretaker"? He also contended the undertaking was a farce, as in Terminus Road at the present time there were premises occupied in respect of which the undertaking had been given.

SOUTH DEVONSHIRE.—A NEW DEVELOPMENT.

AMONGST the many introductions of modern times to combine business with pleasure, perhaps there is nothing that has effected a greater revolution than the system of disposing of land of a moderate area to enable the middle-class capitalist to be his own landlord at some charming inland resort, or in view of the sea at a rising watering-place. It is a practice perhaps as "old as the hills" for land agents to announce that at public sales "refreshments will be provided on the ground," and the writer is old enough to remember that even at our ancient sales at Garraway's in Cornhill, coffee and muffins were gratuitously handed to all who possessed a catalogue.

But it has been reserved for Mr. F. G. Wheatley, F.C.A., of Poole and London, to organise excursions to the far West, that possible buyers may invigorate and brace up their physical and mental powers, inspect some of the charms of Devonshire, and then sit down under the presidency of a judicious auctioneer to purchase what they, as the investing public, have carefully inspected and mentally approved.

Such an excursion we took part in recently, and as we were buyers of one or two plots eligible for a bijou residence, and have no pecuniary interest in the success of the sales, it may not be uninteresting to our readers to have a few details of this excursionary exploit. Salcombe, located at the extreme south of Devon, has recently been brought within measurable distance of a railway station through the extension of the Great Western Railway to Kingsbridge, but it is intended at an early date to continue the line to the former place.

Its surroundings are perhaps the most charming of South Devonshire, combining picturesque scenery of luxuriant foliage

and varied slopes teeming with vegetation with the bold scenery of an estuary of the English Channel. This latter feature perhaps is the most tempting characteristic to Londoners, more especially as the climate has been proved to be health-promoting, with a temperature remarkably equable.

By the invitation of Mr. Wheatley about sixty gentlemen and a few ladies left Paddington on the 27th ult. by the 11.45 express in reserved saloon carriages, and reached Kingsbridge about 6.30 P.M. Accommodation was provided on a liberal yet homely scale at the King's Arms hostelry, and on the following morning the party, enlarged by contingents from local towns, drove to the outskirts of Salcombe, a distance of five miles. The estate, a part of which is already laid out for building sites, was until recently the property of the Earls of Devon, and was purchased by the South Devon Land Company, of 263 Strand, W.C. The lots were freely bought by the excursionists, and, if we may judge from similar sales, the sites realised what we should deem fair business prices; certainly the purchasers were satisfied that they had obtained plots of most charming position, and that they had secured full value for the amounts invested.

We did not recognise many Fellows or Associates of the Institute or of the Association amongst the company, but we are of opinion that any one of our readers might do worse than take an interest in this new marine resort. It is for this reason that we give prominence to Salcombe, knowing that architects are often asked to advise their clients as to the eligibility and advantages of our many English watering-places for health, comfort and recreation. After business was over the company had ample opportunity to enjoy sails round the numerous headlands and the lovely bays that so specially characterise this romantic spot; others indulged in the luxury of a bathe or the delights of a country ramble. The return journey by coach or chaise gave a zest for a well-spread dinner, and the party returned to town by a midday train on Wednesday.

It was mentioned by Mr. Wheatley that a second sale of the company's property would take place on or about the 27th inst., and as the cost to the probable purchaser is nominal, some of our clients would probably find it to their interest to join the next party, especially as at Kingsbridge, where they would stay, there are several old buildings and other archaeological features that are of historic interest.

We should add that Salcombe is located between Torquay and Plymouth, is bounded by the Dartmoor heights, and has a dry rocky subsoil.

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ILLUSTRATIONS.

STATUES OF SOME WELSH SAINTS.

COTTAGE AND STABLE AT HUNSTANTON, NORFOLK.

A TITLE PAGE.

OLD GATEWAY, SAN REMO.

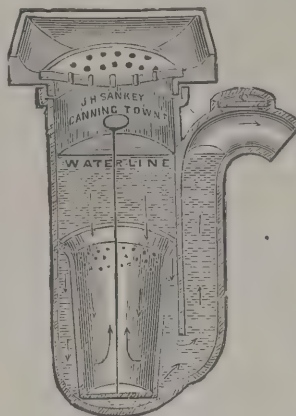
GARDEN ENTRANCE.

SANKEY'S "DEEP" INTERCEPTING GULLEY.

WE have received a model from Mr. J. H. Sankey of his excellent improved gulley and interceptor. Mr. Sankey claims that no other gulley contains so many advantages as his, and it is hard to see what more advantages it could have. It must prove a most useful and sanitary appliance from the principles of its construction, and a great boon from its securing perfect cleanliness, without which a gulley can neither be sanitary nor useful. The employment of Mr. Sankey's gulley will save all the annoyance of having to break up drains to get at a choked-up and foul trap to cleanse it. It will be seen from the engraving that it is most effectual in trapping. It is a deep narrow circular gulley of glazed stoneware, with a deep perforated metal bucket with lifting handle for catching detritus, and the trap seal is so unusually deep that it is impossible for it to unseat even in the driest weather. The construction is perfectly simple. The bucket is of galvanised iron, and it intercepts small stones, dirt, sand, rubbish, fat, grease, &c. The bucket is easily removed at any time, and the gulley does not untrap when the bucket is withdrawn. Tipping buckets are supplied with the largest sizes, which are specially suited for road and street purposes; these buckets can be removed by a small hand crane fixed at the back of the collecting cart, and the mud and other muck tipped direct into same, which is a great saving of labour on the old and present offensive way when muck is scooped up on to the road and then thrown into carts. The inspection-cap gives ready access to drain and gulley,

and if either should require cleaning the process must be most simple.

Stoneware kerbs of various patterns are made with lip to fit in socket of Sankey's improved gulley, with specially strong stoneware and iron grids to fit. Kerbs for the larger sized gulleys are made in segments. Hinged grids and locking grids for schools are made to order. Special iron frames and grates are supplied for stable, road and other purposes. A special



channel for fitting on to ordinary kerb, to carry waste water from house, is specially constructed to meet the requirements of the Board of Works. These do not take up so much room as others where kerb and channel are made in one piece. These stoneware goods are of exceptionally good material, strong, well glazed and finished.

The patent has only lately been completed, the gulley being a recent introduction, but one which is taking well and giving great satisfaction where it is used. The gulleys are made in various sizes and are suitable for nearly every purpose—household, stables, yards, factories, hospitals, roads, streets, playgrounds, schools, &c. Various tops and gratings are supplied for the several purposes, and a large stock is kept in London. Mr. Sankey has now just granted licenses to the following firms (manufacturers):—Messrs. Hexter, Humphersen & Co., of Newton Abbot, Devonshire; The Albion Clay Co., Woodville, near Burton-on-Trent. Both these firms are noted for

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When closed forms an ordinary occasional table. Can be closed and locked with one action, and can only be opened with a key.

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their special stoneware clays, and the latter firm are showing these gulleys at the Liverpool exhibition. Purchasers are advised that they should see that these goods are stamped with "Sankey's Patent Gully."

NEW CATALOGUES.

WE have received from Messrs. Smith & Co., of 45 Oxford Street, Manchester, their new illustrated list. An "Illustrated Catalogue of Mathematical and Drawing Instruments" is the very modest title of this list, which includes pretty nearly every article and instrument required by architects, engineers and surveyors. It is a thick volume, comprising over 120 pages. As an instance of the contents, it may be mentioned that a draughtsman's requirements are consulted to the smallest minutiae—pencils, brushes, drawing paper, sketching blocks, drawing pins, oil and water-colours, chalks, portfolios, &c., not to mention instruments of every kind, compasses and sets of some dozen varieties, protractors, graduated scales of all kinds, clinometers, pentagraphs, planimeters, centrolineads, &c.; also squares of every diverse kind in use. Architects, surveyors and engineers are, or have been, necessarily draughtsmen, and the reference above given to suggest, in a small way, the exhaustive manner in which Messrs. Smith & Co. are prepared to meet their wants as draughtsmen must be taken as an indication of the complete arrangements made by the firm to suit every other requirement of professional men, not only for instruments, but for small and detail articles. One of the most interesting of occupations is that of the surveyor. However fascinating is the work of an architect or an engineer, they cannot dispense with the surveyor, except by combining his work with that of their own profession. Executed architectural and engineering works are a standing monument of the author's skill, but the surveyor's work is practically a hidden work. No visible record remains of his work with theodolite and chain. Levels are taken, mountain ranges pierced, rivers burrowed under, working from both ends to meet with mathematical accuracy. But the instruments required by surveyors are numerous—sextants, magnetic compasses of different kinds; ordinary, prismatic, sight and combination compasses; in smaller matters, measuring tapes, chains; also levels, aneroids, &c. If we have in these short remarks interested our readers, we trust they will consult for

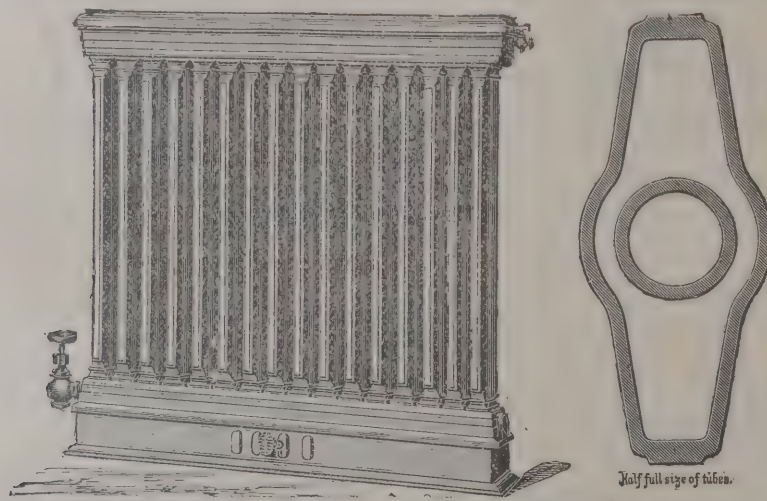
themselves the catalogue which Messrs. Smith & Co. are prepared to forward on application. While maintaining the high finish of their instruments, we understand that the prices have been carefully revised to bring out the goods as far as possible at a reduced price.

REGISTRATION OF PLUMBERS.

THE sessional report of the Ayrshire Plumbing Class has just been issued, being that of the first session—February to June, 1894—of the Glasgow and West of Scotland District Council, National Registration of Plumbers. The class—in support of which a grant of 100*l.* was, in the end of 1893, promised by the County Council of Ayrshire out of the technical education moneys at its disposal—has been conducted in accordance with the scheme which, after holding a meeting at Ayr and communicating generally with the trade throughout the county, this Council, which acts in co-operation with the Worshipful Company of Plumbers, London, proposed to the County Council on January 24 last. In carrying out the scheme the Council have received great and indeed indispensable assistance from a large and representative local committee of master and operative plumbers. With the approval of the governors of the Glasgow and West of Scotland Technical College, the class was at its formation affiliated to that body, and from it the lecturer derived his formal appointment.

The class met in Carrick Street Mission Hall, Ayr, on Friday evenings at 6.15. The first meeting took place on February 16 and the last on June 15—in all twenty meetings. The fees for the course were for journeymen 3*s* 6*d.*, and for apprentices 2*s* 6*d.* It was also arranged that students attending from other towns than Ayr should have their fares (third class return) repaid to them on condition that they should make out not less than three-fourths of the possible attendances, and that they should present themselves for such examinations of the class as should be arranged. The total number of students matriculated was ninety-seven.

The lecturer was Mr. Alexander Dalrymple, Assoc. San. Inst., registered operative plumber, Ayr, who had the advice and co-operation of Mr. J. L. Arnot, registered master plumber, Glasgow. Mr. Arnot frequently met with Mr. Dalrymple and visited the class eight times. The nomination of these gentlemen proceeded from the local committee, and it is satisfactory to report that the arrangement has worked well. Mr. Dal-



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rymple has displayed a grasp of his subject and a facility of exposition which is deserving of all praise, while the practical experience and guidance of Mr. Arnot have proved most useful.

The district council are pleased to learn that with the view of still further equipping himself as a lecturer on plumbing, Mr. Dalrymple proposes to undergo an advanced course of training in the autumn months in London, which the Worshipful Company of Plumbers have agreed to provide free of charge.

The scheme of instruction was that of the ordinary grade of the City and Guilds of London Institute, and dealt with the properties and qualities of lead, tin and zinc, white and red lead, solders and their composition, fluxes, &c., geometry as applied to plumbing, external plumbers' work, &c., varieties of traps, soil pipes, materials and construction of drains, water supplies, cisterns, &c., water-closets, &c. In another session it is intended to have a course in the honours as well as the ordinary grade.

In connection with the class a public lecture, illustrated by limelight views and model apparatus, was delivered by Professor John Glaister, M.D., D.P.H. (Camb.), St. Mungo's College, Glasgow, in the Town Hall, Ayr, on Tuesday, March 6, on the subject of the "Sanitation of the Home." Mr. C. G. Shaw, county clerk of Ayrshire, presided, and there was a large attendance of the trade and of members of the public interested in sanitation and good plumbing.

Arrangements were also made for two class excursions taking place on Saturday, May 12, viz.:—(1) A visit to Messrs. T. B. Campbell & Sons' Leadworks, Cornwall Street, Glasgow, at 10.30 A.M., and (2) a visit to the Glasgow Corporation new sewage works, Dalmarnock Road, at 3 P.M. Over ninety of the students took part in those excursions, and they were accompanied by a considerable number of their employers. The inspection of the leadworks lasted for nearly two hours, during which, under the guidance of Mr. David Campbell, the party had the advantage of seeing in operation the various processes of lead manufacture, including lead rolling, drawing of lead pipes and block tin gas tubes, and the making of red lead. At the new Glasgow sewage works, the party, under the guidance of Councillor King and the manager of the works, were conducted over the entire ground, and had fully explained to them the various processes for converting the contents of the sewers into a pure effluent, and removing the sludge in the ultimate form of solid cakes. The district council were successful in obtaining from the Glasgow and South-Western Railway

Company the privilege of a uniform reduced fare from all parts of the county for this excursion.

The closing lecture on June 8, which was made a public one, was delivered by Mr. Dalrymple before a large and appreciative audience composed of members of the trade and those who have taken an interest in the movement. Mr. Samuel Cowan, chairman of local committee, presided, and at the conclusion the class was addressed by County Councillor Smith, Prestwick, Mr. Morgan, of Ayr School Board, and by Mr. W. P. Buchan, Mr. Arnot, and other members of a deputation from this Council.

The Council and local committee had in view, as part of the scheme, that the students should go forward to the examination of the City and Guilds of London Institute of this year, but it being afterwards found that those examinations were fixed to take place all over the kingdom on May 2 (up to which date the Ayrshire class had only received eleven lectures), it was felt that it would be unfair to all parties this year to attempt an examination for which the normal course of instruction is twenty-five lectures. At the conclusion of the class, however, the examiners of this Council undertook, at the request of the Technical College, to examine the class. The examination took place, by the kind permission of the Ayr School Board, in the Ayr Academy on Friday, June 15.

The following is a copy of the examination paper:—

1. Sketch and figure dimensions of a cistern to hold 100 gallons. What would be the weight of water in same? And say what weight lead, per foot super, you would use to line the cistern with?

2. What weight of solder would be required for the above cistern, and what would be the total weight of the lead, allowing $1\frac{1}{2}$ inches all round the top edge? Show how you would set out the lead for the above cistern, figuring the dimensions on sketch?

3. What size main would you fix to such a cistern (a) if for constant supply, (b) if for intermittent? Assuming the cistern to be 50 feet above the lowest fitting, what would be the pressure in pounds per square inch at the lowest end of the pipe?

4. Sketch or describe a "wash-down" closet, and show how you would arrange the branch soil-pipe to same. What connection would you make between the lead soil-pipe and stone-ware drain?

5. Sketch, full size, a 2-inch wiped joint, showing and describing the preparation of the same. How much solder

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uro Cathedral; Londonderry Cathedral; Sherborne Abbey; Kilmore Cathedral; Stanley Cathedral, Falkland Islands; ardiff Catholic Cathedral; the Queen's School Chapel, Eton; Cork Asylum; Leicester Asylum; and to upwards of ree thousand Places of Worship; and a great number of Mansions, Houses, Hotels, Hospitals, Schools, Warehouses, Factories, Workhouses, &c.

84 Brook Street, Grosvenor Square, W.: December 8, 1893.

Sir WILLIAM BROADBENT encloses cheque for the "GRUNDY" HEATING APPARATUS supplied to his house, and is glad to say that it as proved very satisfactory for warming and ventilating as required. The principle of the apparatus is most excellent.—To Mr. Grundy.

PROFESSOR TYNDALL writes:—

October 24, 1893: Hind Head House, Haslemere.

Dear Sir,—My house being so well provided with grates and flues for the generation and distribution of pure warm air, I have been thus nabled to spend my winters in England instead of on a foreign shore,—Yours very truly,

JOHN TYNDALL.

Dr. GRIEVES says:—

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would be required to make this joint, what tools would be used, and what would be the proportion of tin and lead in the solder?

6. Why does the tin sink to the bottom part of the joint? Assuming the solder to be burnt, what will be necessary to render it fit for use?

7. Sketch two traps in position which in your opinion would be most easily syphoned out, and suggest the remedy.

8. A hot-water tank, 2 feet by 2 feet, is fixed 20 feet below the cold-water cistern and connected with a 1-inch pipe. What is the total pressure on the bottom of tank?

9. What description of drain-pipe would you use in the vicinity of a drinking-water well; how would you join it; and what precautions would you take to avoid settlements?

10. Show the section of a rain-water cesspool with drip, gutter, and rain-water pipe.

11. Show plan of how you would cut and set out the lead for the above cesspool ready for soldering. Describe the weight of lead per foot super that you would use.

12. Name and describe four generally recognised causes of kitchen range boiler explosions, and the remedies for the same.

It is intended to distribute the prizes in the beginning of next session, and the Company of Plumbers have intimated that, with the object of marking their sense of the satisfactory result of the opening and working of the class, they will give prizes consisting of suitable text books, bearing the Company's arms, to the nine students mentioned in the examiners' report.

But for the enlightened action taken by the County Council, the Ayrshire plumbing class of the past session would have had no existence, and the hearty thanks of all concerned are due to them. As regards the future, it is clearly very desirable that an educational movement, which has so direct a bearing on the health of the community, and which has been taken up with so great enthusiasm by the trade, should be maintained. It has been the aim of those directing it to keep down expenditure in every way; but the formation of a practical workshop, such as that which has been fitted up in Glasgow Technical College, is much wanted. Such an undertaking would probably require a capital outlay of about 100*l.*, while there would be an annual expenditure of at least 20*l.* or 30*l.* on instructor's salary and materials. The District Council, therefore, combine with the local committee and the plumbing trade of the county in making an earnest appeal to the County Council to renew, and, if possible, to increase the grant.

PROVINCIAL BUILDING REGULATIONS IN SCOTLAND.

A PAPER on "Building Regulations in Counties" was read by Mr. W. Kelso at the Sanitary Congress in Glasgow. He said it was a no less unfortunate than it was a regrettable fact that the counties of Scotland were still, so far as statutory building regulations were concerned, exactly where they were years ago, and were only in a position to practise sanitation of the old curative or remedial class. Of course it might be said that building regulations, as applicable to counties, did not necessarily require to deal with such a variety of details as those for towns, and that was at once admitted. But the necessity for building regulations to secure proper drainage and sanitary erection of new houses appeared to him to be as great in counties as in towns. The genus "jerry or speculative builder" and his *modus operandi* were much the same wherever he was to be found. As a rule, his first and only consideration was to "run up" buildings without the least regard to stability or the health of those who were to occupy them. Nor was the want of care and attention to sanitary details by those primarily responsible for design and arrangement an unknown thing. It was clear that what they sought to guard against could only be done by statutory regulations which would place the proper authorities in a position to say that certain rules must be observed. Under the circumstances the official could only stand by and await the existence of nuisance. One might almost build anywhere and in any way in the counties, and the sanitary authorities were powerless to prevent it. New houses were thus frequently not many weeks or months occupied till there were complaints of illness or enteric fever or diphtheria, ending in what must be regarded as preventable death. After disease had made its appearance the sanitary inspector, in his present capacity of the curative or remedial official, came in and the cause was found. Was that not something like paying for original sin? The sanitary regulations for new buildings contained in the Burgh Police (Scotland) Act, 1892, could be easily made applicable to the counties with such slight alterations or modifications as might be deemed necessary, and would, he felt sure, prevent in the future the growth and occurrence of those painful and disheartening scenes and experiences to which the earnest county official was not a stranger. It appeared to him that nothing could savour less of class legislation than building regulations. Our sanitary system would be very incomplete and imperfect until that had been effected. Who, he asked, could say that the evil effects which had been

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steadily growing for years owing to the want of building regulations were not to be found in the county residences as well as in the cot, and the troubles which might be caused thereby were no respecters of persons?

Mr. Lindsay contended that the local authority should have the entire control of the sanitary regulation of buildings. Something in that line and not so strong as a Dean of Guild Court, he thought, would have some reasonable hope of passing.

Professor Hay moved:—"That owing to the continued erection of dwellings which are not in accordance with modern sanitary standards and which later on will have to be made sanitary, if at all practicable, at much cost and with great difficulty, this congress is again unanimously and strongly of opinion that power should be given without delay to all local authorities to adequately regulate the construction and surroundings of new buildings."

Mr. G. Thompson, said that the need for regulations was by no means confined to the poorer dwelling-houses. Some of the very largest and most aristocratic dwellings were grossly deficient in sanitary arrangements. There was a great need for elasticity in the regulations. Drainage details, after all, were matters of great difference of opinion.

Mr. Steel said that unless they had a court which would insist that sanitary regulations and requirements would be observed in the laying-out of buildings, the efforts of the sanitary officer would be useless. It was well known that if a sanitary inspector came on to the ground and proposed a great amount of structural alterations on a building, he was met by the proprietor with very serious objections because of the large amount of expenditure which would be incurred. The expenditure would be minimised to a great extent if there were some central authority to take up and sanction all buildings that were being erected. Without that he feared a great deal of the work of the sanitary inspectors throughout the country would be handicapped, and they would be frustrated in their efforts to get the sanitary surroundings which were so desired. He thought that in the appointment of such a court some one should be responsible who knew what buildings were, and that the sanitary inspectors in the district should be represented in that court.

Mr. James Chalmers said that they were all agreed as to the necessity of building regulations. There was a resolution before the congress, but he was prepared to go a step further. He moved:—"That it be remitted to the council to draft a

series of clauses which are adequate to meet the existing evils connected with buildings, including the sanitary requirements, in rural districts."

Both resolutions were adopted.

PROPOSED YORKSHIRE WATERING-PLACE.

A SCHEME which has for its object nothing less than the creation of a new watering-place on the Yorkshire coast is now, says the *Leeds Mercury*, in course of preparation. The situation is all that could be desired, and the conditions generally are calculated to excite a good deal of confidence as to the result of the enterprise. Those who have visited Filey know that in the vicinity of the railway station there is a gentle descent to the beach, embowered by trees known as the Ravine. This is the northern boundary of Filey. Extending northwards are the lofty cliffs reaching to the far-famed Brigg. It is between these points that it is proposed to build the new health-resort. Those acquainted with the locality may think that the undertaking would be more correctly described as an extension of the existing town. But, as will be seen, it is something else than that. There will be contiguity, but little more. The promoters contemplate the creation of a watering-place complete in itself. They further intend that its attractions shall surpass those of Filey and rival those of any other health-resort in the country. This they hope to achieve by retaining full control of the enterprise, and, after making a tour of the most popular seaside resorts, more particularly in the south, by adopting what they find in their travels most desirable. It is an ambitious venture, and the carrying it out will entail the expenditure of a large sum of money; but the details of the project, which have been under consideration for a considerable period, are well matured, and there is no lack of confidence either as to the feasibility of the scheme or as to the possibility of carrying it out successfully.

The natural beauties of the locality have sufficed to give Filey an enviable reputation amongst the watering-places, not only of the north, but of the country generally. Commanding a view of a beautiful sheltered bay, where boating may be enjoyed under safe conditions, the place is picturesque, restful, salubrious. It is preferred for the quietude it affords. The tripper scarcely troubles it at all. Its hard, level sands, extending from the Brigg to Speeton Cliffs, a distance of seven miles, are another of its charms. The Brigg, where white-crested

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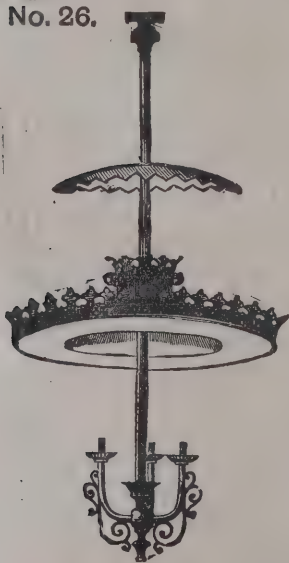
waves are usually to be seen dashing against the rocks with majestic grandeur, to be broken into masses of white water, is the first resort of the newly-arrived visitor. When the delights of the shore begin to pall, there are the numerous pretty drives inland. Should something more stirring be desired, a journey of nine miles in one direction will take the visitor to Scarborough, and one of fourteen miles the other way will land him at Bridlington. It would be an exaggeration, however, to say that the little town offers all that the class of visitors it attracts might reasonably desire. Climbing the steep cliff from the shore demands more exertion than even the most robust find to be agreeable, while to the weak it is, to say the least, a severe tax upon their energy. Now that the attractions of the shore have been materially enhanced by the construction of a fine promenade along the new sea-wall, the want of some easy and inexpensive means of conveyance to and from the beach is felt all the more. Filey would also be greatly improved by the construction of a pier, for, after all, there is little that is more attractive to inland people than the sea. The public gardens on the cliff are a pleasant retreat, and the music of the small band of instrumentalists in the season is also entitled to be taken into account; but here, too, there is scope for improvement. In saying this, however, it must be admitted that Filey, which during the present century has risen from a mere fishing village to the position of a first-class watering-place, has done much to afford her visitors enjoyment, and enough to show that, if her resources were greater, more might be expected at her hands.

The promoters of the scheme under notice hope to be able to supply what they regard as deficient in Filey, whilst laying the foundations of what they intend shall be in all respects a model watering-place. They do not propose to form a company for the purpose, but a syndicate which shall number not more than twelve parties, and probably will not exceed six. The land involved in the scheme, extending, as already explained, from the Ravine to the Brigg, comprises about three hundred acres, with two miles of sea frontage. This is the property of Mr. H. B. Firman, of Gateforth Hall, near Selby, who is the lord of the manor, and the owner of considerable more land in the locality. He is taking the leading part in the enterprise, and some of the other members of the syndicate which is now being formed will be contractors, who will be equal to carrying out the greater part of the works. The architect and engineer is Mr. W. G. Penty, F.R.I.B.A., of York, and he is now engaged in preparing the plans. The

solicitors are Messrs. Haigh, Son & Thompson, of Selby, and they are busily engaged with other preliminaries. The scheme comprises the construction of a sea-wall from the Ravine to the Brigg, a distance of more than half a mile, thus forming a continuation of the sea-wall which was completed a few months ago. As in the latter case there will be a spacious parade behind the wall, and the picturesque valley called Horndale, some two or three hundred yards from the Ravine, will be transformed into public gardens and a spa, there being a mineral spring of saline and chalybeate water in the vicinity. Two streams on the estate will, in all probability, be brought through Horndale in order to enhance the attractions by the introduction of waterfalls. When completed the parade, gardens, &c., will be more extensive than those of Scarborough. The accessories will comprise a band-stand, and probably also a large concert-hall. The construction of a tramway from the top of the cliff to the beach is now under consideration; and the plans will show an iron pier running into the sea some 1,700 feet, considerably below low-water mark. In laying out the estate, a large portion of the land nearest the cliff will be reserved for villas and bungalows. Behind these will be the town proper, and here the streets will be about 70 feet wide, laid out in the Continental style, with lines of trees and flower-plots. Fountains are to be placed at points where the streets cross each other, and at the corners will be more flower-beds. Nothing is to be done to disturb the quietude of the place; the tripper will be discouraged at all points, but obviously it will be impossible to maintain the simple character of Filey. It must become more fashionable, and some people, no doubt, will regret the change. As already mentioned, the syndicate intend to keep the control of the enterprise in their own hands, and hence their proposal to build summer residences on the estate to order. No jerry-building will be tolerated, and the greatest care is to be taken to insure thorough sanitary arrangements. The syndicate will be advantageously situated in being able to obtain clay, stone, lime and sand for building purposes on the estate. A building has already been erected with such materials so acquired. Eventually companies will most likely be formed to take over the pier, parade and cliff tramway.

The plans are nearly completed, and it is expected that operations will be commenced early in the spring of next year. The first work undertaken will be the construction of a sea-wall, but it is at present proposed to proceed by sections. Until the estimates are completed it is difficult to say what amount of capital will be required, but it is believed that the

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carrying out of the scheme will entail an expenditure approaching a million sterling. It is not proposed, however, to ask the public to subscribe; it is intended that the members of the syndicate shall provide the whole of the capital.

THE BLACKWALL TUNNEL.

THE operations at the Blackwall Tunnel are now approaching the point at which the work will have to be carried on actually beneath the bed of the river. Some delay, says the *Daily News*, has been occasioned by the cutting edge of the "shield" by which the tunnel is actually bored having been bent by contact with a mass of rock. That has now been repaired, and progress is about to be resumed with the subaqueous portion of the tunnel. This mishap to the shield has not, of course, hindered the advance of the river bank portions of the work. On the Middlesex side of the river about 700 feet of the open approach to the tunnel has been finished, and the second of the two shafts which on this side will give access to the tunnel below for foot passengers has been got down to a depth of 33 feet by means of crane and grab. On the south side of the river the work is considerably more advanced. There will here be a length of 1,000 feet of what is technically called "the cut and cover" portion of the tunnel—the portion, that is to say, which is not bored out underground, but for which an enormous trench is cut, the tunnel built in it in the ordinary way, and then covered in. Of the thousand feet just about three-parts has been finished. On both sides of the river all the property standing in the line of the tunnel and its immediate approaches has been demolished, and the new dwellings for the people disturbed, as required by Act of Parliament, have been set up, and for the most part are occupied.

In these land portions of the tunnel there is nothing very exceptional in the work unless it may be in the magnitude of it. From end to end, including approaches, the length will be 6,200 feet, considerably over a mile, and the tunnel, of which 750 feet has now been completed and covered in, is a huge circular gallery, 24 feet 3 inches in diameter. But the work of real difficulty is now about to commence with the under-river portion of the tunnel. The boring by means of the great circular drumhead—the "shield"—weighing 250 tons, with a sharp cutting edge in front, and at the back of it twenty-eight hydraulic jacks, each shoving with the force of a hundred tons,

has already been in progress on the southern margin of the river, where it has been necessary, in order to keep out the water, for the men to work under compressed air. They have had 120 men working in three shifts under an air pressure of 24 lbs. to the square inch over and above the normal pressure of the atmosphere. This was carried on for two months, and in some twenty cases men were more or less injured by it, three or four of the men proving so especially susceptible to injury that it was deemed advisable to discharge them. Different men it appears to affect in different ways. The commonest symptoms are what the men themselves describe as "tooth-ache in all their bones." In some it produces violent pains in the pit of the stomach, and in extreme cases it paralyses the lower limbs. The London County Council have adopted a scheme by which men injured in the course of this air-pressure work will receive compensation, and some provision will be made for their families in case of death or permanent disablement. Arrangements are also being made to have a medical man resident on the works. One curious experience of men working under any pressure above about 10 lbs. to the inch is that they cannot whistle, and another is that all their voices are curiously raised in pitch, so that a man with a deep bass voice finds himself talking in a high tenor or alto. It is said, however, that the thinness is largely compensated for by the strength of the adjectives. Experience thus far has shown that the air-pumping appliances will have to be materially increased. They are ample for insuring the required pressure theoretically; but, as a matter of practical experience, it is found that the loose, pervious nature of the earth forming the margin of the river bed permits a certain proportion of the air to blow through, and the pressure is thus reduced. Messrs. Pearson & Sons, the contractors, are therefore preparing to double their air plant.

The injury to the shield has been repaired, and it is now about to resume its burrowing on its gloomy and perilous way right across the river. The first 600 or 700 feet will, it is hoped, present no very serious difficulty. Borings have shown that for this distance the tunnel will have the benefit of a thick bed of clay overhead. This will, of course, diminish the liability to an influx of water from above. On emerging from the shelter of this stratum of clay, however, the tunnel will have to make its way beneath a river bottom of loose earth, shingle and sand, and this part of the undertaking will probably give the contractors the most serious anxiety, though of course their whole passage under the river will be beset with risks with



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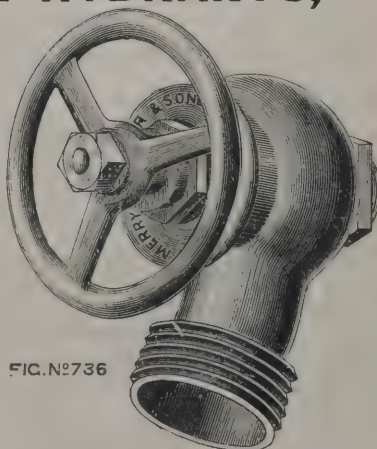
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which engineering science when the Thames Tunnel was built would have been powerless to cope. What they have to do here at this Blackwall Tunnel is to burrow under the river, which at high water is 47 feet deep at this point, with only about seven feet of earth between the soffit of the tunnel and the water above. Even Brunel, with all his audacity, would have shrunk from such a venture. Indeed, apart from Mr. Greathead's system of tunnelling such a feat would be wholly impracticable. This system has now been adopted in many works with complete success, but it has never yet been tried on the same scale. No "shield" has ever before been built for the boxing of a tunnel 27 feet in diameter. However, the thing will no doubt be done, and Mr. Moir, who represents the contractors on the work, and who successfully carried out a large portion of the Hudson River Tunnel, seems to carry a tolerably light heart, and so do the two County Council engineers, Mr. Hay and Mr. Fitzmaurice, representing Mr. Binney, the Council's chief engineer. As one means of reducing the peril of a great influx of water when the boring emerges from under the existing clay bed, it has been determined to throw down a covering of clay over the river bottom. The Thames Conservancy have just authorised this, stipulating however that this covering shall not exceed 10 feet in thickness. The contractors would have liked a thickness of 15 feet, but this, it is objected, would possibly interfere with the passage of shipping up and down the river. No less than 15,000 cart loads of clay will be required even for the 10-feet covering, and the cost will be some thousands of pounds.

SANITARY PLUMBING.*

A GREAT deal has been written and said of the terrible havoc made from time to time through the agency of defective plumbing-work in Great Britain and America, and in most cases the cause has been attributed to the plumber without proper inquiry, forgetting or ignoring the fact that he (the plumber) was entirely guided by the specifications, which, in the majority of cases, were framed on false economy, and very often ignorance of the subject by the architect. I am now speaking of what I know from experience. As a sample, an

* A paper read before the Associated Master Plumbers of Victoria by Mr. F. B. Brady, master plumber, on Tuesday, July 10, 1894, and published in the *Australasian Builder*.

architect specified (where the owner would willingly pay for good work) a 4½-inch cast-iron rain-water pipe with red lead joints for vertical soil pipe from three water-closets, and to make matters worse, had it fixed in a recess in wall. When remonstrated with he said, "Carry out the work as specified, and I will accept all responsibility." I merely mention this as an instance of how the plumber is blamed for defective work when the specifications distinctly give him material to use which renders it impossible to make the work secure for any length of time, and then the architect is the first to fix the blame on the plumber. I sincerely trust for the sake of all concerned that the architects of this colony will have all fixed rules and data at their fingers' end, so that incompetent and unscrupulous persons may be prevented from undertaking the execution of work which they do not understand. I consider every architect should be sufficiently instructed in plumbing to know the difference between good and bad work in course of construction, not after.

Too little attention has been given in the past to this important (to my mind the most important) work in a building; hence the great trouble afterwards. At present there is a great diversity of opinion *re* lead *versus* iron for soil pipes. Modern experience teaches us the great advantages of lead over iron, more especially as we can now secure solid drawn lead pipe of any weight and length suitable to our mild climate. It still holds its own as a material for soil and waste pipes in all good work, except in America, where the extreme varying atmospheric changes and its position in buildings render it almost necessary that the soil pipe should be of iron. Still, even in America, lead soil pipe is very extensively used. Lead possesses smoothness of surface (which is essential in soil pipes), maximum resistance to corrosion and incrustation, can be easily bent to suit any position required, perfectly and securely jointed, branches can be easily inserted at any time, and last but not least, when useless as a conductor, will retain its marketable value as old lead. On the other hand, cast-iron pipes of the size required are never very smooth, especially when they exceed 6 feet in length. How often do we find on cutting a cast-iron pipe an absence of that smoothness (so necessary) from the internal surface, although at each end it had a perfectly smooth appearance? Again, the jointing is never so reliable, no matter how well made, and in the event of any deviation from the straight line and branches usually kept in stock, you have to get special connections, &c., made, which entails additional expense and loss of time. No doubt some

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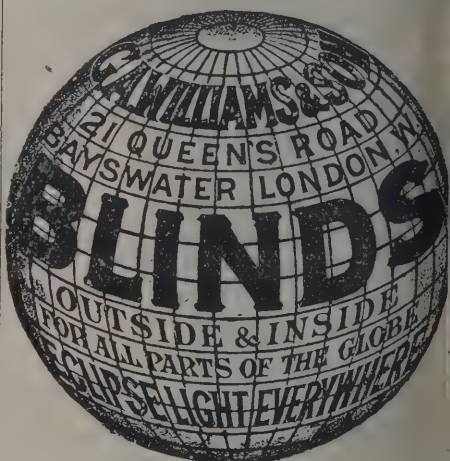
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will maintain you can procure any description of joint, but experience teaches us differently. Some good authorities, notably Hellyer, prefer that cast-iron pipe when used as a soil pipe should be galvanised, and afterwards coated with Dr. Angus Smith's solution. The idea looks well on paper, but unfortunately in practice we all know the short life of any of the solutions used, and again, in a great many cases it helps to cover defects and imperfections which might exist in the pipe. From practical experience I doubt very much the efficacy of any solution when applied to iron soil pipes. I prefer them without, although I do not for a moment dispute its qualities as a temporary resisting medium to oxidation in iron pipes, when used as a conduit for fresh water. I am at a loss to know why such good authorities prefer that cast-iron pipe should be galvanised when used for soil pipe. I am sure it requires no great reasoning to prove that the use of zinc in any way connected with soil or waste pipes should be studiously avoided and condemned, and no architect or plumber should allow such to be used. Now as to incrustation, I have taken down some cast-iron soil pipes which had been in use for about eight years. When I examined them the amount of deposit on one side of the pipes, especially at the joints, was incredible, but wherever the incrustation was greatest the pipe was perfect, although you could crush the opposite side with your fingers. No doubt the deposit formed a concrete and protected the surface covered at the expense of the other side. I might mention it was a medium description of a cast-iron pipe ventilated but improperly. At a recent Convention of the master plumbers of New York, a section of iron soil pipe taken from a building was exhibited. The exhibit showed in a practical way the ravages made on iron pipe when fixed as a soil pipe. When touched it crumbled into powder, although the drain pipe which was fixed at the same time appeared to be in a fair state of preservation, with the exception of a deposit of rust. If required I could give several instances like the foregoing with date and place.

In speaking thus of iron pipe I do not for a moment condemn it, as I know perfectly well that it will be largely used in our coming work in Melbourne, but I lay the foregoing points before you in order to encourage a discussion, as by such means only can we arrive at a definite issue. Moreover, as a drain pipe I would compel it to be used in all cases when passing through or under a house, for buried in the earth it would be free from the atmospheric influences to which it would be subject when fixed as a soil pipe; but in all cases

care should be taken to avoid the use of galvanised, cast or wrought-iron for soil or waste pipes even when disconnected from the drain. Now as to lead soil pipes, I have often read and heard a great deal about the incrustation on same, but in my experience I have failed to discover anything approaching the incrustation previously described as existing in the iron pipe, even when fixed under much more unfavourable conditions, viz. no ventilation. One proof of this statement. During a building alteration in the Mercy Hospital, Cork, 1881, I had to remove a stack of 4½-inch lead soil pipe which had been in position for over thirty years and was not ventilated. I was astonished at the state of preservation of the lead, the only portion of which that looked suspicious was the soldered seam. I cut the seam out, left the lead to dry, and when I again examined it found no sign of deposit except a small powdered substance. But the lead traps, especially the seal chamber and above it, when touched actually fell asunder, being completely oxidised. Still I do not doubt there have been such cases of incrustation in lead soil pipes met with, but I have never seen them.

One great objection to lead soil pipes when fixed externally is the means usually adopted for fixing it, viz. soldering lead tacks to the back of the pipe or using ordinary holdfasts, both of which should be avoided, as in the usual course of expansion and contraction (no matter how slight) the lead must suffer at the rigid points where either of the above means are used. A better style, and one that would suit all purposes, is a special holdfast, consisting of the ordinary spike welded on to a bell-mouthed ring with a layer of thick felt and lead flange, which would allow the end of the soil pipe to be tacked over and make the ordinary flange (wiped) joint. Also to fix astragals with strong lead lugs, two to each length of pipe, the holes in the lugs to be larger than the spikes or screws used for fastening, to allow for expansion, &c. By adopting this means you at once remove the objection mentioned above and make a perfect job. Another objection to lead is the fear of rats, or as they are called at home, the plumber's friend. I can safely say I have never met with a properly fixed lead soil pipe which was touched by our friends. I have seen soil pipes fixed in very peculiar places, where only a rat could get, and I consider he did a good service in compelling them to remove a hidden death-dealer. No doubt in time we likewise will be asked to fix pipes in unsuitable positions, but I trust we will refuse to do so. No soil or waste pipe should be fixed in out-of-the-way places, but always where it could be easily examined. Another

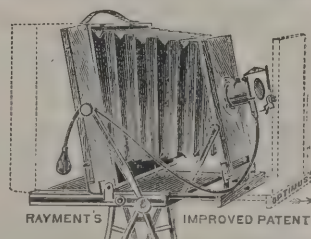
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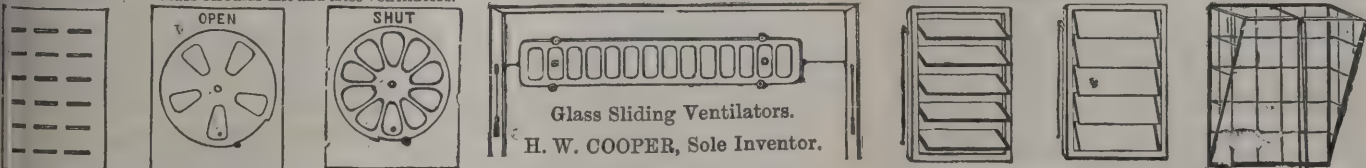
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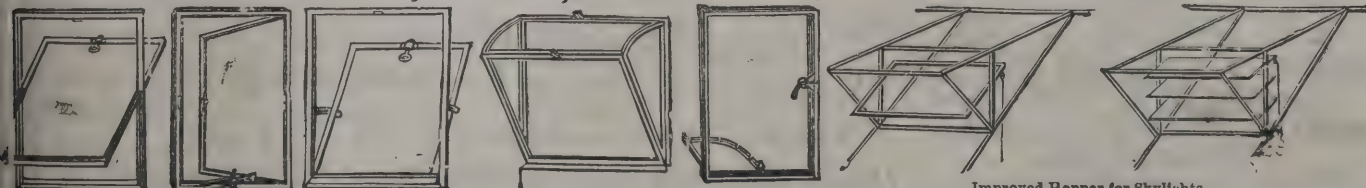
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objection likely to arise in Melbourne is the great heat. Well, to overcome that I would suggest that all exposed pipes should be cased. The pipes being principally at the rear of buildings will not be an eyesore, and the results to property owners will well repay the outlay.

Now as to the use of earthenware pipes, I would strictly limit their use (in houses) to places where no great harm would result from leakage; for no matter how well laid and jointed, there is always a danger of leakage from various causes (subsidence, &c.), also carelessness of workmen. More especially is this the case in Melbourne, where they allow any handy man to lay and connect earthenware pipes, no doubt reasoning that being buried in the ground the water must get away somehow, little caring what damage is done to occupiers or owners of property. I presume you, Mr. Chairman and gentlemen, like myself, have come across earthenware pipe laid with the joints apparently perfect, but on closer inspection have found the bottom without any cement packing, although it was no greater trouble when fixing to make the joints equal all round. Recently I was sent to examine a hotel, erected about seven years, where the cellar was continually filled with water. Several inspections as to the cause had been previously made, but resulted in failure, some suggesting subsoil drainage, &c. The first point that attracted my attention was the level at which the water entered the cellar; after examining the houses on either side, I concluded the leak was from a higher level. I presume the point that deceived so many in previous inspections was a cast-iron drain pipe fixed across the roof of the cellar and which they naturally concluded extended the full distance under the parlour to the sink in the yard. By adopting a test, I soon found the leak was between the sink and the cellar; when I removed the bricks forming the sink the smell was unbearable; several cavities in the cement bottom contained putrid and decomposed matter, which on being disturbed emitted a frightful stench. When tracing I found an earthenware pipe from sink in yard to cast-iron pipe 6 inches from cellar wall, every joint of which was leaking, the end one being separated from the iron pipe, although you could see where it had been inserted in socket of iron pipe. I mention this to prove how unreliable earthenware pipes are when fixed under a building. The brick sink I have mentioned above is very often met with in buildings with a grating over the top. Why anyone could think of fixing them I cannot understand, as they are the greatest propagators of disease in existence and should not be countenanced by architects or builders,

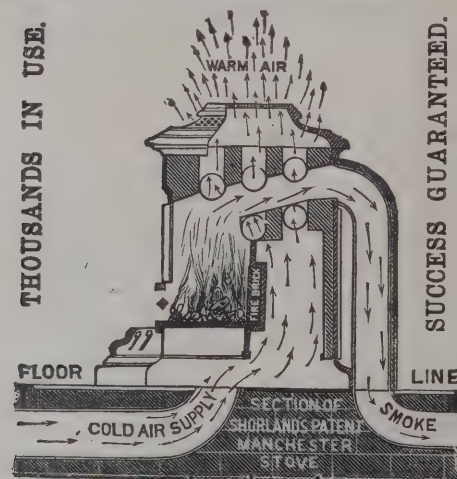
especially as they can easily procure a surface trap which would answer a dual purpose, viz. prevent offensive smells and choking of drain pipes. The bad habit of using earthenware elbows instead of bends is carried out to a great extent in Melbourne, and in a great measure is responsible for so many useless drains.

Of late years the practice is to reduce the bore of the soil pipe to a minimum size compatible with perfect working, but I think the minimum should be $3\frac{1}{2}$ inches for vertical soil pipe (I would fix 4 inches). The more the pipe is reduced the greater the chance of syphonic action, especially when two or more closets are connected to it. And even when the soil pipe is extended full bore to roof (a distance) you increase the friction in the vent (soil pipe) which under certain conditions fails to prevent syphonage. Under these conditions it shows the absolute necessity of an independent ventilating pipe, into which you connect the branch vents near traps. Of course no intelligent plumber would think of connecting the vents on to the crown of traps, although some maintain it is the correct place to vent from. Why? We all know that every time the closet is discharged the lighter substances are bound to strike that particular spot, and eventually close it, thereby making it perfectly useless and dangerous, as the vent being close the trap might lose its seal through syphonage without anyone being aware of the cause. When erecting a soil pipe, for its size we will have to be guided by the number of closets connected on to it; for two or three closets I would recommend that less than 4-inch soil pipe should not be used, the traps being $3\frac{1}{2}$ inches. I would recommend that the soil pipe be extended full bore 6 inches above the highest point of roof, and 6 or 8 feet from the nearest dormer or window, and also that a 2 $\frac{1}{2}$ -inch or 3-inch independent vent pipe be taken from the point between the end of soil pipe and surface inlet of disconnecting trap, but below the grating of same. Then fix 2-inch vents from water-closet branches into independent ventilating pipe and extend same to a level with the soil pipe. By adopting this system you secure the lightest standard of safety whilst also making a perfect and lasting job, which will well repay the additional cost.

When men enter into the kingdom of traps the first feature that strikes us is the great difference of opinion regarding them, each writer maintaining his is the best; in fact, what spoils some fair technical works is the continual repetition of "my trap," "my ventilator," &c., is the best, leading one to believe the work was written to advance the sale of each

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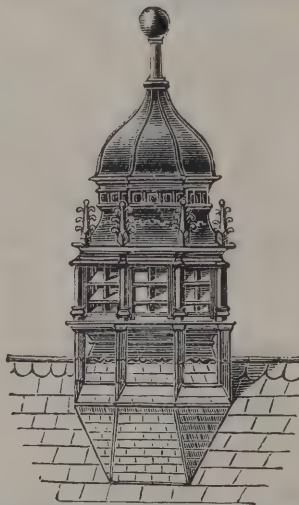


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writer's wares, instead of advancing the cause of good plumbing, but with all their boasted improvements the ordinary clear-way P.S. and horizontal trap still holds its own. The latest writers in this field are Putnam and Smeaton, the former advocating the "Sanitas" as being the only non-syphoning trap in existence and against venting wastes. Of the "Sanitas" I cannot speak, never having seen one in use; besides, as a commercial article it is useless to plumbers, as no one but the Sanitas Co. will be allowed to fix them. I might say it is for lavatory purposes only. The "Eclipse" trap, to my mind, is a modification of the universally condemned D trap, not even possessing the D's one quality, resistance to syphonage and momentum when unventilated, the outgo being too easy and the seal only one inch. Besides, it exposes too much surface above water level, which is sure to receive the particles of fæces bound to adhere and accumulate, as no water can possibly touch a considerable portion of the top surface. To make matters worse, it is a cast-lead trap, the most treacherous of all kinds, and I consider a cast-lead trap should never be allowed to be fixed. I have known cast-lead traps in appearance as smooth and perfect as glass which had, after twelve months use, to be removed, several defects showing then which could not be detected by the tests to which they were subjected (at least we are led to believe every cast and machine-made trap is tested).

At present we have a lot of mechanical traps on the market—"The Ball," "Flap Valve," &c.—all of which we may set aside, for no matter how well they might act when experimenting, still after a short time in actual work they become perfectly useless and dangerous. I will cite a case. In the board-room of a large warehouse, whenever the directors met they complained of a very bad smell. An examination of the fittings revealed the cause; a badly-made trap connected direct into the sewer from a wash-hand basin, which being very seldom used the trap lost its seal through evaporation. The plumber called in to rectify it suggested the advisability of fixing a ball trap, which he declared would prevent sewer-gas from entering through the trap, even though no water was in the chamber of the trap. About six months after I had to attend for the same complaint. On removing the trap screw I found human hair around the ball, which held some matches as firmly as if tied with fine twine. Some of the hair had gone over the outgo or weir of trap, and the matches held the ball out of position, thus setting up capillary attraction at once. I removed the ball and fixed a properly-made P trap, disconnected

the waste from sewer, allowing for perfect aeration, with the result—no more complaints. This also proves the advantages of disconnection, for even if the trap lost its seal the above alteration removed the danger and decreased any unpleasantness to a minimum.

Of late years a great tendency has been shown towards making traps with a very easy outgo or weir, which is in itself one of the main causes of loss of seal, for when a trap is made with an easy outgo its resistance to momentum is considerably reduced; whereas when properly made with the first sections parallel, and the outgo nearly a right angle, you get what to my mind is the proper standard of a trap—minimum amount of water to allow for thorough cleansing at each discharge and maximum amount of seal to resist syphonage and momentum, of course with proper ventilation. There are other enemies which rob the trap of its seal. First, capillary attraction, caused through hairy or fibrous matter overhanging the weir of trap. Very often it is responsible for unsealing of traps, and the last thought of. As for loss of seal through evaporation, I need scarcely dwell on that, as I am sure no water-closet will be fixed inside the house unless for absolute use, and if they should neglect to use it for ordinary purposes, they can at least allow a discharge of water into it occasionally. The only exceptions are our large city buildings, some of which might be vacant for months. In such cases a means can be arranged to flush the traps at certain intervals.

All soil pipes should discharge into a disconnecting trap fixed at foot of same, the trap to have an iron grating, with large iron bars, to act in a dual capacity, induct for vent and soil pipes; also to receive the wastes from baths or lavatories. At present there seems to be a misconception about disconnection of lavatory and bath wastes from drain. I maintain you should not connect any of these wastes direct into the drain or soil pipe any more than you would the rain-water pipe. No doubt a lot is due to misapplication of technical terms. For instance, in a recent publication, the *Decorator's Gazette*, I noticed a trap styled "The improved Kenon disconnecting trap," when in reality it is an intercepting trap, or, if you like, one form of boundary trap. The intercepting trap is fixed to prevent the gas from sewer entering the house drain and the disconnecting trap to allow the wastes from baths and lavatories to discharge over or near trap, allowing for complete aeration of waste pipes. In a great many cases disconnecting traps have been removed after being in use for a short time, owing to the neglect of plumbers in not fixing a vent or exhaust

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pipe between the soil pipe and grating, for when the closet is discharged the column of water in the soil pipe displaces the air in its descent, and if the vent is not fixed as above the foul air is sent through the grating, thereby causing a disagreeable smell, especially if the trap is fixed (as it very often is) under or near a window or door.

Some well-known sanitarians advocate the connecting of drain and soil pipes direct with the sewer, depending entirely on the traps of water-closets and baths, &c., as being sufficient protection against the entry of sewer gas into the house, their contention being that every soil pipe would help to ventilate the sewer and prevent the accumulation of gases therein, entirely overlooking the possibility of the traps becoming unsealed from causes beyond the householder's control. Whilst a strong advocate of direct and continuous ventilation, I would certainly choose a different means from the above to secure it. The ventilation of sewers is not the province of the householder; that portion can be safely left to the boards controlling the sewer to see after. As a proof of the strides the English system has made, the Technical Sanitary Commission of Paris, in 1883, recognising the benefits of disconnection and ventilation, framed their regulations accordingly. Article 5 says all leaders shall be intercepted so as to prevent direct communication with the sewer. Article 7 says every soil pipe and sink waste shall be carried above roof to establish active and permanent ventilation, fully adopting the English system. As for sink wastes, their position will have to be guided entirely by the use made of them, and in the majority of cases it will be necessary to fix a grease interceptor, from which the waste can be conveyed under the grating of disconnecting trap. No doubt some who are against disconnection will argue the dangers likely to arise from such a system, as in the event of a person suffering from infectious disease taking a bath; but with all due respect we might leave that to the doctor to safeguard against. The system is extensively carried out at home, with the most satisfactory results, and I am sure a little consideration will convince the most sceptical of its great advantages. Some writers would use and recommend a non-syphoning trap to all wastes from baths, sinks and lavatories, depending on the flushing for removal of gaseous accumulations and aeration of wastes; but from observation my advice is to avoid them as much as possible and go in for ventilation. You will always find, along with being non-syphoning, they are also receptacles for filth. Of course there are times and places when you will require a special style of trap, and the plumber

will be called on to devise a means to overcome that difficulty. In making any kind of non-syphoning trap it is absolutely necessary that the bottom should taper like an inverted cone, as by this means you increase its cleansing qualities without interfering with the seal. A large brass cleaning screw should be soldered on the bottom of trap.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

15811. Frederick Jacks, for "Back-draught preventing chimney-top and ventilator."

15818. Frank Young, for "Improvements in the manufacture of fire-clay refractory and non-conducting bricks and blocks building bricks and the like."

15834. Henry Wood, for "Improvements in the manufacture of men's and boys' knitted drawers."

15840. Walker George de Forgés Garland and William Shears, for "Means for raising, lowering and securing window-sashes."

15863. Walter Stead, for "Combined grating box and door trap for sewers, gullies, cesspools, &c."

15936. Charles Parsons, for "Improvements in window fasteners."

16010. Cornelius Lee Polden, for "An improved window-sash fastener."

16021. Charles Buchanan and John Barr, for "Pivot sash and case window."

16052. Richard Whitehead, for "An improved window-sash fastener."

16109. Edward William Sheldrick, for "Improved window-sash."

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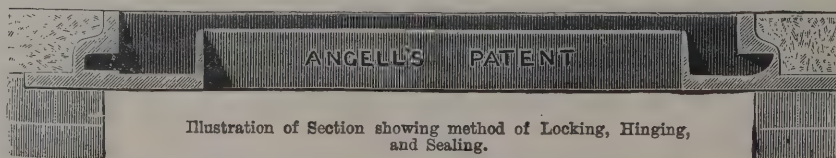


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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

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BEN RHYDDING.—Sept. 17.—For Building Residence. Mr. Jas. Ledingham, Architect, District Bank Chambers, Bradford.

BRADFORD.—Sept. 17.—For Building Schoolkeeper's House. Mr. E. P. Peterson, Architect, 10 Exchange, Bradford.

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BRIGHTON.—Sept. 28.—For Erection of Refuse Destructor Buildings and Chimney Shaft. Mr. Francis J. C. May, Town Hall, Brighton.

BURNLEY.—Sept. 25.—For Buildings and Chimney at Outfall Sewage Works. Mr. F. S. Button, Borough Surveyor.

CAMBRIDGE.—Sept. 14.—For Construction of about 3,000 Yards of Brick Sewers and 90,000 Yards of Pipe Sewers, with River Crossings, Manholes, &c. Mr. J. T. Wood, M.I.C.E., 3 Cook Street, Liverpool.

CARDIFF.—Sept. 21.—For Erection of Exhibition Buildings. Mr. Edwin Seward, Architect, Queen's Chambers, Cardiff.

CARTMELL FELL.—Sept. 14.—For Building Underhoused Barn, Hare Hill. Mr. James Holmes, Blackholme, near Newby Bridge, Lancashire.

CRAWLEY.—Sept. 21.—For Additions to Crown Inn. Mr. Wm. Buck, Architect, 65 West Street, Horsham.

CHELMSFORD.—Sept. 29.—For Building Cottages. Mr. F. Whitmore, Architect, 21 Duke Street, Chelmsford.

DISLEY.—Sept. 17.—For Additions to Police Station. Mr. Stanhope Bull, County Surveyor, Northgate Chambers, Chester.

FARNHAM.—Sept. 19.—For Bath-room and Water-closet at Workhouse. Mr. E. Crundwell, Clerk, South Street, Farnham.

GELLIGAER.—Sept. 22.—For Extension of Tirphill Board School. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

GLASGOW.—Sept. 14.—For Building Sanitary Offices. Mr. J. Lang, City Chambers, Glasgow.

HALIFAX.—Sept. 27.—For Building Two Wool Warehouses. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HALIFAX.—Sept. 22.—For Building Board School for Infants. Mr. J. F. Walsh, Architect, Waterhouse Chambers, Halifax.

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HECKMONDWIKE.—Sept. 20.—For Building Church. Mr. W. Swinden Barber, Architect, 28 George Street, Halifax.

HORNSEY.—Sept. 17.—For the Supply of 100 or 200 Fire Hydrants and Covers. Mr. F. D. Askey, Southwood Lane, N.

ILKLEY.—For Building Two Shops and Houses. Mr. C. H. Hargreaves, Architect, Craven Bank Chambers, Bradford.

IPSWICH.—Sept. 18.—For Works at Board School, Argyle Street. Mr. F. E. Bishopp, Architect, Museum Street, Ipswich.

LEEDS.—Sept. 17.—For Rebuilding Cardigan Arms Hotel and Old Toll Bar Hotel. Mr. Thomas Winn, Architect, 90 Albion Street, Leeds.

LIVERPOOL.—Sept. 18.—For Erection of Superstructure of proposed Head Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

MARYLEBONE.—Sept. 18.—For Rebuilding Baths and Washhouses. Mr. Marchant, 181 Marylebone Road, N.W.

RUABON.—Sept. 17.—For Additions to Board Schools. Mr. J. Denbigh Jones, Clerk, Johnstown, Ruabon.

SAXMUNDHAM.—Sept. 21.—For Building Board Schools. Mr. John Fry, Solicitor, Saxmundham.

SEAFORD.—Oct. 3.—For Building Infants' School. Mr. W. Kent, North House, Seaford.

SHIPLEY.—Sept. 24.—For Building Cemetery Chapel, Lodge, &c. Mr. S. Jackson, Architect, Tanfield Chambers, Bradford.

SMETHWICK.—Sept. 14.—For the Construction of about 1,900 Yards of Brick Sewers and Conduits, and 3,700 Yards of Pipe Sewers with Manholes, Lampholes, Bell-mouths, &c. Messrs. Harris & Harris, 9 Bennett's Hill, Birmingham.

SOUTHBOROUGH.—Sept. 18.—For Erection of an Isolation Hospital. Mr. Wm. Harmer, 137 London Road, Southborough.

SOUTH NORMANTON.—Sept. 24.—For Building Board School for Infants. Mr. J. T. Shardlow, Architect, Blyth Road, Worksop.

STAINSBY.—Sept. 18.—For Building Boys' School, &c. Messrs. Rollinson & Son, Architects, 13 Corporation Street, Chesterfield.

ST. GEORGE-IN-THE-EAST.—Sept. 21.—For Building Casual Wards, Old Gravel Lane. Messrs. Wilson, Son & Aldwinckle, Architects, 1 Victoria Street, S.W.

TOTTENHAM.—Sept. 18.—For Building Public Library. Mr. P. E. Murphy, Engineer to the Local Board, 712 High Road, Tottenham.

TURTON.—Sept. 14.—For Building Police Station. Messrs. Henry Littler & Son, Architects, 4 Chapel Walks, Manchester.

WALSALL.—Sept. 17.—For Additions to Board School. Messrs. Bailey & McConnal, Architects, Bridge Street, Walsall.

WALSALL.—Sept. 22.—For Building Police Station. The Borough Surveyor.

TENDERS.

ALNWICK.

For Providing and Laying Cast-iron Socket Pipes and Fittings, Christon Bank, for the Alnwick Union Rural Sanitary Authority.

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G. Thompson, Alnwick	169	16	0
Thompson & Wright, Alnwick	157	0	0
G. M'Laren, Embleton	155	16	0
J. M'Laren, Embleton	152	0	0
W. Appleby, Embleton	141	0	0
J. N. REAVELL, Alnwick (accepted)	140	14	6

BATTERSEA.

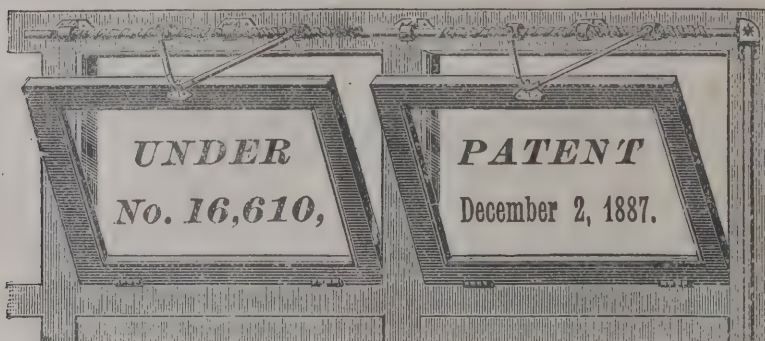
For Reinstating Portion of the Premises destroyed by Fire at the Victoria Steamboat Association's Dockyard, Battersea Bridge Road, S.W. Messrs. FULLER, HORSEY, SONS & CASSELL, Surveyors, 11 Billiter Square, E.C.

Baker Bros., Battersea	£320	0	0
W. E. Hill, Borough	305	0	0
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E. F. Richards & Co., Barry	1,037	13	3
T. Rees, Ely	967	4	6
D. Love & Sons, Barry	957	1	6
F. Ashley, Cardiff	890	13	0
R. Smith, Cardiff	889	16	0
E. R. Evans & Bros., Cardiff	726	18	2
E. H. PAGE, Cardiff (accepted)	687	17	1

COWBRIDGE.

For Building Post Office, Cowbridge. Messrs. BRUTON & WILLIAMS, Architects, Cardiff.			
Knox & Wells, Cardiff	£971	0	0
D. Davies, Cardiff	840	0	0
D. Jones & Co., Gloucester	831	0	0
A. J. Howell, Cardiff	799	0	0
H. Davies, Cardiff	792	0	0
Haines, Cardiff	770	0	0
J. Morgan, Llantrissant	680	0	0
COOKSLEY, Pontyclown (accepted)	635	0	0

CROFTON PARK.

For the Erection of a Detached Villa, for Mr. G. Hayward, Mr. JOHN JAS. DOWNES, Architect, 11 The Parade, Lewisham High Road, S.E.			
JACKSON, Lewisham (accepted)	£450	0	0

DEWSBURY.

For Additions to the Dewsbury Working Men's Club. Messrs. HOLTOM & FOX, Architects, Westgate, Dewsbury.			
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Accepted Tenders.

W. Scott & Sons, Dewsbury, mason	£397	0	0
T. Richardson and Sons, Staincliffe, joiner	144	0	0
F. Newsome, Dewsbury, plumber	64	0	0
J. Lockwood, Staincliffe, plasterer	32	0	0
G. Fawcett, Dewsbury, slater	20	0	0

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For Erection of a House, Elstree. Mr. ARTHUR KEEN, Architect, 4 Raymond Buildings, Gray's Inn.			
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J. & W. Savage	1,143	0	0
C. Miskin	1,087	0	0
W. BAILEY, Bushey Heath (accepted)	880	0	0

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For Building Infants' School at Hale, Farnham. Mr. J. A. EGGAR, Architect, Farnham.			
J. Glass, Surbiton	£3,234	0	0
R. Pink, Milford	2,628	0	0
H. Patrick & Co., Farnham	2,575	0	0
A. Chuter, Frensham	2,495	0	0
D. H. Porter, London	2,440	0	0
E. Hughes, Wokingham	2,423	10	0
A. J. Figg, Farnham	2,415	0	0
Goddard & Son, Farnham	2,402	0	0
Martin, Wells & Co., Aldershot	2,400	0	0
J. Bottrill & Son, Reading	2,395	0	0
G. Kemp, Aldershot	2,375	0	0
W. J. Snuggs, Aldershot	2,333	0	0
Tompsett & Kingham	2,325	0	0
T. Martin, Maidenhead	2,300	0	0
Gammon & Son, Petersfield	2,284	0	0
M. E. Fitt, Reading	2,277	0	0
Belham & Co., London	2,271	0	0
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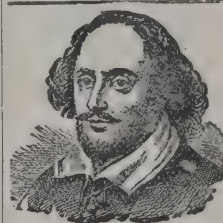
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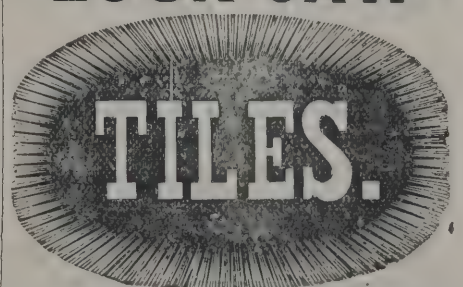
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J. Hawkins, Ashford, Middlesex	805	0 0
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Skidmore & Co., Birkenhead	782	15 4
Lawrence & Nicol, Liverpool	698	17 7
Martin & Fitt, Grantham	682	10 0
W. HARBROW, London (accepted)	620	14 7

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Read & Curtis, Gorleston	1,441	10 0
J. Balls, Great Yarmouth	1,422	0 0
J. F. W. Bray, Great Yarmouth	1,422	0 0
J. Ward, Great Yarmouth	1,364	0 0
Flaxman, South Town	1,324	0 0
J. Grimble, Great Yarmouth	1,299	0 0
J. W. Cockrill & Sons, Gorleston	1,266	0 0
G. BECKETT, South Town (accepted)	1,238	0 0

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For Alterations and Additions to Elmhurst, Aylestone Hill, Mr. W. W. ROBINSON, Architect, 10 King Street, Hereford.		
Bowers & Co., Hereford	£639	0 0
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For Alterations and Additions to the Roman Catholic Schools. Mr. W. W. ROBINSON, Architect, 10 King Street, Hereford.		
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PAGE & SON, Leominster (accepted)	£1,289	0 0

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J. Burrill, Manor Park	2,468	0 0
E. Iles, Mitcham Common	2,366	0 0
J. Jackson, Plaistow	2,275	0 0
W. Wadey & Co, Stoke Newington	2,233	0 0
H. Michell, Walthamstow	2,177	0 0
C. W. Killingback & Co., London	2,172	11 2
W. Coker, Halling	2,040	0 0
G. Osenton, Westerham	2,011	0 0
W. Hook, Upminster	1,942	11 6
D. Brewer, Plumstead	1,836	0 0
G. Bell, Tottenham	1,813	0 0
J. Band, Grays	1,770	0 0
Macandrews & Co, Ludgate Hill	1,750	0 0
J. L. Cattell, Stoke Newington	1,740	0 0
G. G. RAYNER, Liverpool (accepted)	1,675	0 0
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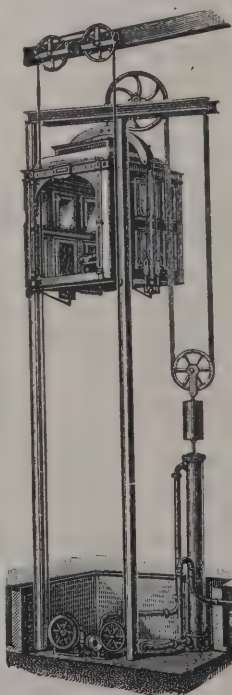
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H. Crane	2,455	0	0
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T. Adams	2,623	11	5
H. Wall & Co.	2,543	10	0
J. Dickson	2,378	0	0
H. Walker	2,377	1	4
H. Crane	2,355	0	0
J. Jackson	2,290	10	4
Wilkinson Bros.	2,282	0	0
F. A. Jackson & Son	2,247	0	0
J. Mears	2,185	0	0
C. W. KILLINGBACK & Co. (accepted)	2,182	0	0
R. Ballard, Limited	2,177	0	0
G. Bell	2,093	10	0

LONDON—continued.

Brunswick Square Sewer.

J. Dickson	£804	0	0
Wilkinson Bros.	785	0	0
T. Adams	731	8	1
H. Wall & Co.	717	0	0
F. A. Jackson & Son	690	0	0
S. W. Pattinson	675	0	0
H. Crane	649	0	0
J. Mears	622	0	0
R. Ballard, Limited	617	0	0
W. Walker	614	13	0
C. W. Killingback & Co.	613	0	0
J. JACKSON (accepted)	584	12	9

For Fence Wall, Disinfecting Station, Gatekeeper's Lodge, W.C. and Urinal, Providing and Fixing Entrance Gates, &c., at the Board's Depôt, Glaucus Street, Bromley St. Leonard, for the Poplar Board of Works.

F. W. Hubbard, Bow	£1,053	17	6
J. T. Robey, Bow	1,025	0	0
J. Yates & Co., Millwall	957	10	0
G. T. Anderson, East India Dock Road	875	0	0
T. H. Jackson, Poplar	857	0	0
J. Edmunds, Poplar	824	0	0
T. White & Son, Bow	802	0	0
Surveyor's estimate	932	0	0

For Laboratory, Refitting Latrines, and New Wood-block Floors at the Grammar School, High Cross, Tottenham. Mr. ALFRED RICHARDS, Architect, 18 Finsbury Circus, E.C.

H. Knight & Son, Tottenham	£833	0	0
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Five other tenders received.

For Alterations, Additions and General Repairs to Nos. 593, 595, 597, for Mr. R. A. Langford. Mr. JOHN JAS. DOWNES, Architect, 11 The Parade, Lewisham High Road, S.E.

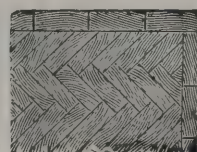
Herring, Peckham	£975	0	0
Larke, City	896	0	0
Lorden, Tooting	867	0	0
Powditch, King's Cross	830	0	0
Champion, Peckham	705	0	0
BEST, New Cross (accepted)	689	0	0

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MEVAGISSEY.

For Construction of Lifeboat House and Slipway at Mevagissey, Cornwall, for the Committee of the Royal National Lifeboat Institution. Mr. W. T. DOUGLAS, Engineer, 17 Victoria Street, Westminster.
LANG & SONS, Liskeard. £1,900 0 0

NEWPORT.

For Building Hotel Premises on Site of Steam Packet Hotel, New Dock Street, Newport, Mon., for Messrs. W. Hancock & Co., Limited. Mr. W. L. GRIFFITHS, Architect, 27 High Street, Newport.
Stephens, Bastow & Co., Bristol £2,579 0 0
W. Price, Newport 2,550 0 0
D. C. Jones & Co., Gloucester 2,395 0 0
C. H. Reed, Newport 2,300 0 0
D. Parfitt, Newport 2,265 0 0
J. Jenkins, Newport 2,263 0 0
J. Moore, Newport 2,255 0 0
J. T. Morris, Newport 2,225 0 0
E. C. Jordan, Newport 2,195 0 0
J. Davies, Newport 2,100 0 0
J. Linton, Newport 2,085 0 0
W. A. LINTON, Newport (accepted) 2,048 0 0
A. S. Morgan 2,025 0 0

NORTHAMPTON.

For the Erection of Stabling, Loose Boxes and Cart Shelters in Mill Street, Semilong, for Mr. Robert Wiggins, Coal Merchant, Abington Street, Northampton. Messrs. MOSLEY & ANDERSON, Architects, Goodyear Chambers, Northampton. Quantities by Architects.
J. W. Walls, Northampton £625 0 0
R. Hickman, Northampton 620 0 0
J. Garrett, Northampton 579 10 0
J. Robinson, Northampton 562 0 0
Newman Adams, Northampton 545 0 0
W. Gregory & Son, Northampton 544 10 0
Wilford & Judkin, Northampton 540 0 0
G. F. Sharman, Northampton 539 0 0
W. Throssell, Northampton 535 0 0
J. Dunkley, Northampton 523 0 0
T. A. Fisher, Northampton 515 0 0
A. J. CHOWN, Northampton (accepted) 464 10 0

PONTYPRIDD.

For Building Villa Residence at Graigwen, Pontypridd. Mr. T. R. PHILLIPS, Architect, Old Bank Chambers, Pontypridd.
W. WILLIAMS, Coedpenmaen (accepted) £1,500 0 0

SOUTHEND-ON-SEA.

For Laying Pipe Sewer, with Manholes, &c., in the Hamlet Valley, for the Corporation. Mr. C. T. COPLEY, Borough Surveyor.
J. & J. Jones £446 10 4
D. H. Porter, London 412 4 0
G. Wimpey & Co., Hammersmith 406 14 7
F. Dupont, Southend 383 19 7
J. Band, Grays 373 0 0
H. Lee, Southall 366 13 5
E. Iles, Mitcham 360 17 6
C. F. Coker, Halling 318 13 11
C. W. Killingback & Co., Camden Town 314 17 9
W. BUXTON, Prittlewell (accepted) 315 3 2

WESTHOUGHTON.

For Construction of Pipe Sewer, for the Westhoughton Local Board.
J. Bates, Hollinwood £356 3 6
H. Hodgkinson, Westhoughton 218 4 0
E. Merrick, Stafford 215 0 0
W. Armstrong, Walkden 204 8 0
W. POLLITT, Bolton (accepted) 194 18 9
J. Caldwell, Atherton 175 6 0
S. Cowburn & Son, Hindley 171 3 0
J. Horrocks, Westhoughton 165 8 11
T. & H. Scott, Westhoughton 160 13 6
F. Tonge, Westhoughton (labour) 85 10 0

YOUGHAL.

For Constructing Town Reservoir, Two Filtration Tanks and a Catchment Tank, and also for Supplying Cast-iron Mains with Fittings.
T. J. Dixon, Dublin £8,232 9 6
M. Connor, Youghal 7,583 5 6
D. Forde, Ballincollig 6,905 11 4
R. W. Johnson & Co., Cork 6,141 18 9
Hickson & Peet, Tralee 6,010 4 4
M. WALSH, Tipperary (accepted) 5,945 8 3
E. W. Finn, Charleville 5,697 9 4
J. Donoghue, Clonakilty 5,670 3 9

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Mr. J. W. BROWN, C.E., Borough Engineer.
J. DICKINSON, Middlesbrough (*accepted*).

VARIETIES.

A NEW park has been opened at Newport, Mon., on which the Corporation have spent 20,000*l.* The site, comprising twenty-three acres of land, was the gift of Lord Tredegar.

THE Wolverhampton Town Council propose building a library and reading-room, subject to the approval of the Local Government Board, on a site at Springfields.

A FIRE at Hanley has taken place on the premises of Messrs. Bullock & Bennett, earthenware manufacturers, causing damage to the amount of about 2,000*l.* Two hundred work-people are thrown out of employment.

DURING the excavations at Chichester for the drainage works the workmen have already discovered 225 coins, several vases and jars, three mill-stones, tiles, and an axe, nearly all Roman examples.

A SUM of 760*l.* has been obtained at a bazaar held in Harrogate in aid of the building fund of a volunteer drill hall.

THE Bridgnorth Board of Guardians have received sanction to borrow 1,560*l.* to carry out alterations at the workhouse.

AT Bridge of Weir, Renfrewshire, Sir Wm. Arrol has just laid the memorial-stone of the first of a series of buildings to be used as an hospital for the treatment and cure of consumption. The author of the scheme is Mr. William Quarrier, the founder of the Orphan Homes of Scotland. The total cost is estimated at from 50,000*l.* to 60,000*l.*

THE Scarborough Town Council have decided that proceedings should be taken forthwith for obtaining the consent of the owners and ratepayers of the borough to borrowing 70,000*l.* for the construction of a marine drive and sea wall round the foot of the Castle Hill.

THE Bolton Town Council propose to spend 5,000*l.* on cold stores under the Market Hall and 75,000*l.* on the extension of the sewage system, to meet the requirements of the Mersey and Irwell joint committee.

IT is stated that in the current half-year the Midland Railway Company contemplate expending 650,000*l.* upon new works, the London and North-Western Railway Company 478,000*l.*, and the Great Western Company 250,000*l.*

THE Wallasey Local Board propose to carry out improvements and form a lake in the central park at a cost of 600*l.*

WORKS in the Brede Valley, about seven miles from Hastings, have been in progress for the last two years, and the Corporation of Hastings are now actively proceeding with the scheme for establishing permanent works which will secure a constant supply of deep well water. The water obtained from this district is soft.

AT the meeting of the Paisley Dean of Guild Court plans were passed for the erection of a home for the nurses to be employed in the new infirmary to be built at Paisley.

ELECTRICAL.

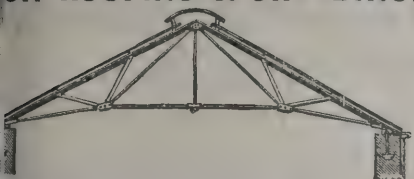
THE Middlesbrough Corporation electric-lighting sub-committee propose the laying-down of an electric-light installation at a cost of 25,000*l.*

THE Wolverhampton School Board have accepted the tender of Messrs. T. W. Scott & Co., of Birmingham, at 233*l.*, for installing the electric light at the Walsall Street School.

ELECTRICITY has been adopted for towing the canal boats on the summit level of the Canal de Bourgoyne, which connects the Seine and Soane, crossing in its course the divide between the channel and the Mediterranean.

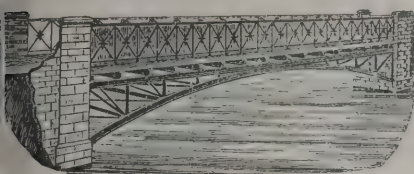
DURING the year ending May 31, there was a deficiency of 607*l.* on the operations of the electric-light department of the Glasgow Corporation. This result, it is stated, of the first full year's working of the three-wire low tension system compares favourably with the result of last year's operations, when the deficiency was 1,773*l.* 12*s.* 6*d.* The revenue had increased from 7,784*l.* to 18,015*l.* The committee anticipate that the use of electricity will be taken advantage of in larger measure during the current year. The quantity of electricity sold during the year to private consumers was 543,178 Board of Trade units, being an increase over the preceding fifteen months of 107.14 per cent. The gas accounts show a surplus of 4,271*l.* Out of this is defrayed the deficiency in the electric-

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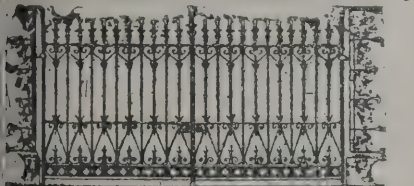
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"Burton Weir" Tile Panels and Hearths.

"THE GOLD MEDAL RANGE,"
With Lifting Fire.

WORKS, ROTHERHAM, Estab. 1854.

lighting accounts, whilst a sum of 3,500*l.* is transferred to fire insurance, &c., fund, leaving 164*l.* to be carried forward.

At the meeting of the Montrose Town Council, a resolution to apply for powers to supply electric light for public and private purposes was defeated. A public meeting is to be called to oppose the lighting of the town by any private company.

THE Glasgow Corporation have arranged for the lighting of the tramway cars by means of electricity. There will be two lamps inside each car and two lamps outside, which will enable all passengers to read newspapers and books.

BUILDING AND BUILDERS.

THE committee appointed to inquire into the causes of the explosion in May at the Waltham Abbey powder factory express their "plain and decided conviction that the position, or perhaps, more strictly, the distribution of the buildings comprising the Quinton Hill factory, and more especially that part of it which concerns the manufacture of nitro-glycerine, is eminently unsatisfactory," and the redistribution of the buildings and the establishing of a duplicate factory on some separate site are recommended.

WORKMEN are clearing the site for the new offices of the Commission of Sewers in Basinghall Street. The buildings will cost 36,000*l.*

M. BOURGEOIS, a contractor at Lourdes, has commenced legal proceedings against M. Zola for allegations in his last romance concerning the building of a church at the "Grotto."

TRADE NOTES.

MESSRS. JONES & ATTWOOD, of Stourbridge, have just opened offices at 110 Cannon Street, London, E.C., where architects and others will be able to obtain full particulars of their well-known heating apparatus.

THE new hospital which is being erected by the Birkenhead Corporation, from the plans and under the superintendence of the borough engineer, Mr. C. Brownridge, is now nearing completion. It is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

"J. R." writes to us:—Sometime ago a circular was sent to my office by a firm offering to supply small lithographic outfits, suitable for use in offices. As I have mislaid their circular, can any of your readers supply me with the address of the firm who sent it out?

THE sites and buildings committee of the Halifax School Board have accepted tenders amounting to over 2,000*l.* for enlarging Siddal School.

THE contracts for the new Manchester and Sheffield Company's line to London have been let as follows:—No. 1 contract, Messrs Logan & Hemmingway; No. 2 contract, Mr. Henry Lovatt; No. 3 contract, Mr. W. H. Topham; No. 4 contract, Mr. Thomas Oliver; Nos. 5 and 6 contracts, Mr. J. T. Firbap; and No. 7 contract, Mr. John Jackson.

WE hear that Messrs. H. Parsons & Harris have recently supplied their patent radiators for warming the cabins of the steam-yacht *Maid of Honour*, for Mr. Francis Barratt, M.A. These radiators are specially suitable for such purposes as this, owing to the remarkably small space they occupy in proportion to their surface.

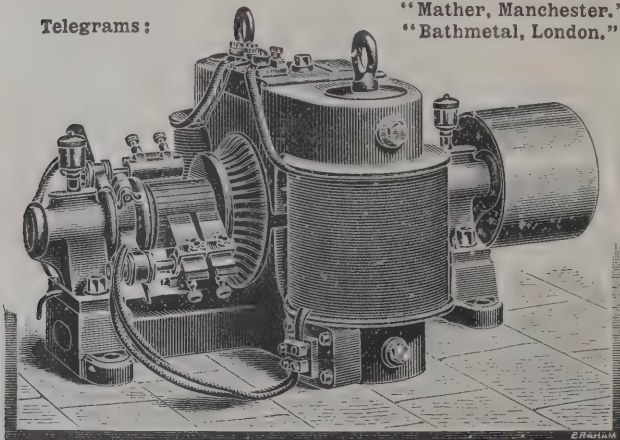
THE west-end window of the south aisle of Coleshill Church has been filled with a stained-glass memorial window, the subject of which is the Epiphany. The window is designed by Mr. T. W. Camm, of Smethwick, and erected at his studio. The drawing is of an excellent character, and it is thoroughly artistic in colour and treatment generally.

MALVERN COLLEGE.

THE extensive sanitary improvements which have been recently carried out at Malvern College under the direction of Mr. J. E. Willcox, C.E., of Birmingham, are now completed, embracing a thorough reorganisation of the whole of the drainage system and sanitary arrangements, at not only all the College buildings, but at each of the masters' houses in the College grounds, all of which have been put into a perfect sanitary condition. The whole of the fittings are of the most modern type, and the work done throughout of a high order. The undertaking, which involved a very considerable outlay, necessitated the employment for several weeks of some 200 men, including forty plumbers, and was successfully completed without having to close the College. The whole of the plumbing was carried out by Mr. E. France, of Birmingham, and the greater portion of the drainage by Messrs. Wood &

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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147 STRAND, LONDON, W.C.

Leach, of Handsworth, whilst the structural alterations, new sanitary blocks, and part of the drainage were executed by Mr. T. Broad and Mr. W. Porter, both of Great Malvern. The sanitary specialties, urinals, latrines and lavatory ranges, &c., were by Messrs. Adams & Co., of London, York, Birmingham and other places, the school lavatories being of white glazed ware, and the urinals consisting of white glazed angular backs, with glazed ware capping and base combined in one piece, and special corrugated drip tiles. The flushing grease traps and drain interceptors were supplied by Messrs. Dent & Hellyer, of London, and the pedestal closets used were Twyford's Deluge M. Messrs. W. J. Williams and T. R. Day acted as clerks of works.

NEW CATALOGUES.

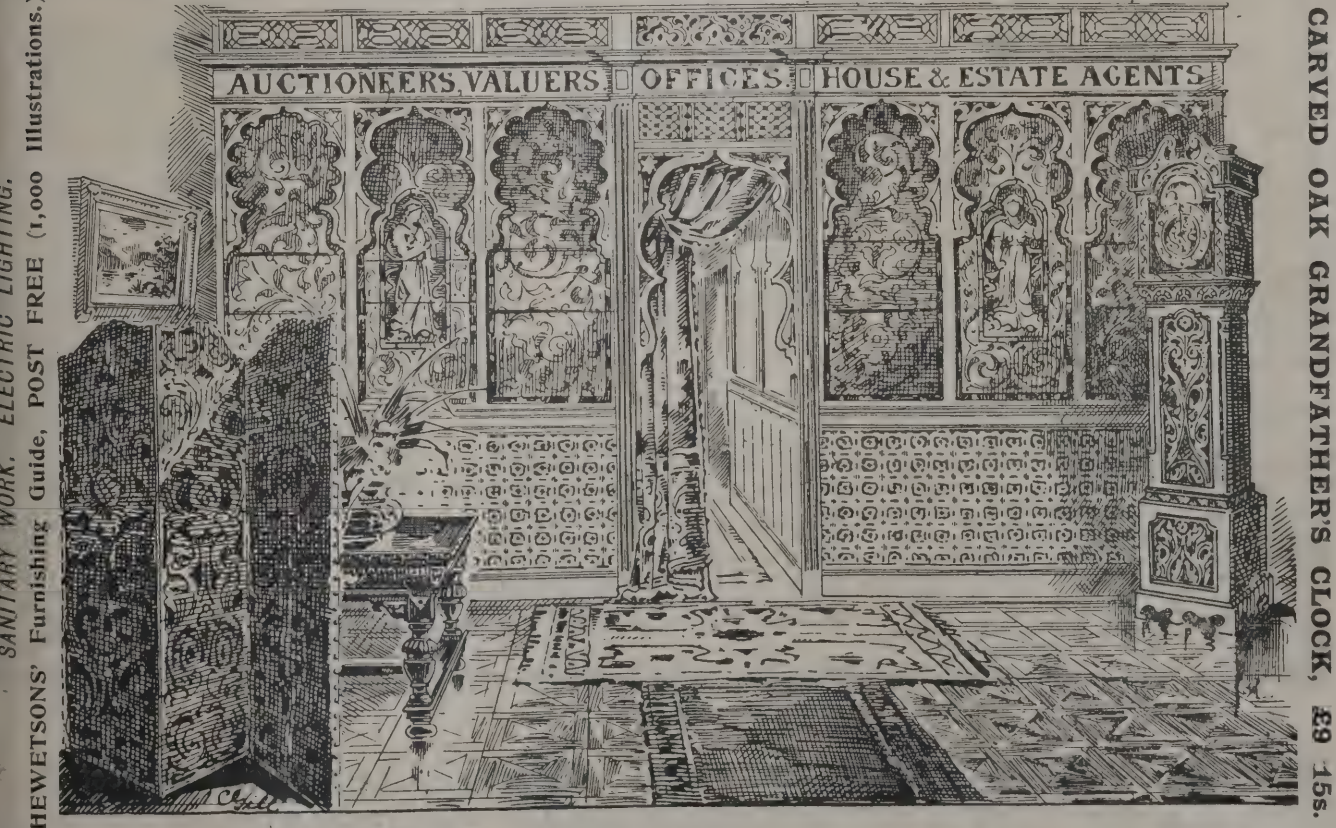
We have received from Messrs. Claughton Brothers, lead founders, of the Sanitary Lead Works, Bramley, near Leeds, a new illustrated price-list issued this month. Since their previous list was issued Messrs. Claughton Brothers found it necessary to remove into larger and more convenient premises, which have been specially designed to meet the increasing demand for their goods. All the articles are of very superior manufacture, none but experienced workmen being employed. A rule of the firm is not only to supply the best quality of goods, but to execute orders as promptly as possible, a practice which cannot be too highly commended. Among the articles illustrated in the list are the following:—Oval stench traps, improved syphon traps, spout funnels, taper pieces or cones, bell traps, junctions, sockets, pipe clips, double-banded pipe clip, soil-pipe terminal, pedestal trap, single tacks, double tacks, lead ears, &c. These goods are beautifully made with the best of lead procurable, and the increasing demand for them should be a guarantee of their excellence. Lastly, Messrs. Claughton Brothers ask their clients to kindly note change of address.

We have received from Messrs. Hart, Son & Peard a new illustrated catalogue (section 7) of their builders' ironmongery. The contents of this edition have been so well arranged that it is even easier than before to consult it for compiling specifications and indents. We may call attention to one feature that will be of great interest to architects, builders and ironmongers, viz. that the great variety of goods include "out-of-the-way" stock. These, when required, are often wanted at short notice, and time is lost unless it is known where they can be had. It is only by glancing over a catalogue like this that persons not

connected with building would get an idea of the multiplicity of objects that have to be illustrated. So simple a part of a house as a door may require much furniture—hinges, door springs, keys, locks and bolts, finger-plates, handles, knockers, letter-boxes, &c., and each one of these articles constitute quite a tribe in their different varieties and designs. With regard to window requirements the same will be found the case in the numberless articles required. Space will not permit us to deal more at length with the contents of the catalogue, but it is evident that a client will have hard work to ask Messrs. Hart, Son & Peard for an article and not be shown it. There are many points of interest that might be mentioned, but our readers can always consult the list for themselves. There are a large quantity of goods concerned with sanitary matters, ventilating and heating, ventilators, gratings, plain and ornamental, rain-water goods, articles also to meet kitchen and scullery requirements.

AN illustrated price-list has been issued by Messrs. Hayward Brothers & Eckstein (section 8), dealing with the Safford hot water and steam radiators, as specified for all first-class buildings; also with the "Daisy" independent boilers. Messrs. Hayward Brothers & Eckstein inform us that they do not erect apparatus, but afford every facility within their power to aid the hot-water fitter in securing and working an efficient apparatus; and that, notwithstanding the variety of sizes they offer of the Safford radiators and the "Daisy" independent hot-water boilers, they keep a complete stock so as to secure reasonable prompt delivery. They add that heating is now so well understood as to require but little consultation on the part of their friends with reference to the ordering of plants, but having studied this question in Canada, where the question of heating is of vital importance, they have now entered upon the manufacture of the Safford screwed nipple radiators and the "Daisy" independent hot-water boilers, which combine every possible advantage with durability, having a reputation already established. They now offer these radiators and boilers, which for simplicity of form, extent and quality of surface, together with cheapness and economy, give the best results ever obtained, and challenge examination and comment from hot-water engineers and others. The rapid advance in heating by hot-water circulation, they say, is worthy of attention, and it has been demonstrated by experience that this system is superior to all others on account of its many advantages and economy in fuel. The list will be valued by many owing to the practical directions and information given in the pages.

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MISSION, PORTSMOUTH.

STREET CORNER IN WOKINGHAM.

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THE HALIFAX MARKETS.

At the last meeting of the Halifax Town Council, there was reference to a statement about the contracts for the new arcade which was submitted by the architects, Messrs. Leeming & Leeming, showing a total of 13,496*l.* 3*s.* 10*d.*, and the extras added, the amount was brought up to 13,987*l.* 0*s.* 10*d.*

Mr. J. T. Spencer asked for some explanation relative to the excess of the cost of the markets over the original estimate.

Alderman Smith (chairman of the committee) remarked that Mr. Spencer was a member of the committee, and he had had the opportunity of acquainting himself with every item of the expenditure.

Mr. Spencer said the advance over the original estimate was equal to about 70 per cent.

Alderman Smith said he could give the details if the councillor were prepared to listen to him for a few hours.

The Mayor remarked that Councillor Spencer must either accept the statement as given in the report, or move an amendment.

Mr. Spencer moved that the statement be referred back, in order that some explanation might be given accounting for the enormous difference of almost 70 per cent., as between the actual cost and the architects' estimate.

Alderman Whitaker seconded. He said there were several discrepancies between the architects' figures and those given by the borough accountant. Misleading statements should not be made.

The Mayor observed that he did not see what would be gained by the adoption of the amendment, seeing that Councillor Spencer was on the committee, but as suggestions had been made which would almost make it appear that there was something going on there ought not to be, it would be best, perhaps, to refer back the statement.

Mr. H. E. Greenwood remarked that the contractors' tenders were sanctioned by the council, and it would amount to a censure upon the council to pass the amendment.

Alderman Whitaker : Nothing of the kind.

Mr. Greenwood : It is a gross misrepresentation.

The Mayor remarked that it was not the first time statements of a similar character had been made. It was necessary that the council might see that all was right and square that the statement should be referred back.

Alderman Whitaker considered it very unfair for the Mayor to make such remarks and not to allow him (Alderman Whitaker) to have a word.

The council resolved to send the statement back to the committee.

THE PANAMA CANAL.

WHILE returning recently from an engineering engagement in Ecuador, I was compelled to stop over in Panama eight or ten days to await steamer connection in order to reach the United States. Naturally, out of professional interest, I utilised this opportunity for an examination of the Panama canal, as it appears to-day, the result of which is this article. It may be remarked, however, that the figures used here are taken from the calculations of M. de Lesseps's engineers, and they are given for what they may be worth, as the time at my disposal did not permit any separate reliable calculations to be made.

As the canal has been surveyed and laid out between Colon, on the Atlantic, and Panama, on the Pacific side, it will have a total length of 46.7 miles. Owing to the peculiar formation of Panama Bay, the Pacific end is really the eastern terminus of the canal. The canal runs through the valley of the Rio Chagres and almost parallel to the Panama railway until within a few miles of Panama. Its distance from the railway varies

* From a paper by Mr. O. A. F. Saabye, in the *Engineering Magazine*.

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from a few hundred feet to about half a mile. The proposed general width of the canal is 72 feet at the bottom and 100 feet at the water's level, with the exception of the section between San Pablo and Pedro Miguel, where the respective widths, as proposed, would be 78 feet bottom and 102 feet at the level of the water. The navigable depth is to be from 28 to 29 feet, and all curves of the canal to be constructed with a radius of not less than 8,000 feet. At the mouth of the canal at La Boca, about three miles south-west of Panama, it is proposed to build a basin or kind of harbour, about 5,000 feet long by about 400 feet wide, for vessels to await transport, and at Tavernilla, about midway between the Atlantic and Pacific, another to allow ships to pass each other.

The elevations along the canal route are about as follows:—From Colon to Frijole, a distance of eighteen to twenty miles, the ground rises almost uniformly to 25 to 30 feet, with the exception of a short distance at Bohio Soldado, where the elevation reaches 160 to 170 feet above sea level. Between Frijole and Matachin, about eleven miles distant, the elevations vary from 50 to 115 feet. At Matachin is another short loma (hill) of about 155 to 165 feet elevation. From Matachin to Culebra, a distance of about six miles, the elevations run from 90 to 260 feet until they reach at Culebra the highest point on the whole route. Here the cerro is about 323 feet above sea level for a distance of nearly 1,000 feet. From Culebra the ground falls again uniformly to the Pacific, with an elevation of about 15 feet at the junction with the Rio Grande.

According to surveys and observations made by the engineers of the Panama railway during its construction, the mean level of the Pacific is from '14 to '75 of a foot over that of the Atlantic. The highest tide at Panama is 21'30 feet, and the lowest 7'94; the highest spring tide in the Pacific over the highest spring tide of the Atlantic is 10'12 feet, the mean high tide of the Pacific over that of the Atlantic is 6'49 feet. These conditions would, if the canal is constructed as a tide-water connection, enable vessels to make the passage on one tide of six hours' duration.

The French engineers have calculated the total canal excavation necessary at something like 157,200,000 cubic yards, of which about 24,000,000 cubic yards are contained in the Culebra cut. This amount, I understand, includes also extra work outside the canal proper—for instance, laterals for draining the Rio Chagres, &c. Of this total excavation I judged that about from three-eighths to one-half—or about 70,000,000 cubic

yards—has been done. Of the total length of the canal, about one-half, including about fifteen miles on the Atlantic side, has been finished, or very nearly so, and there is water in this portion on both sides, its depth varying from 18 to 23 feet. The finished part is in comparatively good condition. Besides the work already done, the canal company has on hand, distributed at both terminals and at convenient points along the canal route, an immense stock of machinery, tools, dredges, barges, steamers, tugboats and materials for continued construction. At Panama, La Boca and Colon, as well as along the canal, are numerous buildings, large and small, for offices, workshops, storehouses and warehouses, and for lodging and boarding the men who were employed on the work. The finished work, as well as all the machinery, tools, materials, buildings, &c., are well taken care of and looked after. The canal company employs 100 uniformed policemen, besides numerous watchmen, machinists and others, whose sole duty consists in watching the canal and looking after needed repairs of plant and care of materials. In fact, the work and the whole plant is in such a condition, so far as I could ascertain, that renewed construction could be taken up and carried to a finish at any time it is desired to do so, after the company's finances will permit. In this connection it may be mentioned that the canal company has built, and still partly maintains, a hospital in Panama, which in magnitude, comfort, equipments and general appointments excels some of our best American hospitals, and in fact could give them good points in hospital management. This hospital, which is in charge of the French Order of Sisters of Mercy, is situated about $1\frac{1}{2}$ miles north of Panama, on beautifully laid-out grounds, at an elevation of 300 to 400 feet above sea level, giving a magnificent view of the suburb bay at Panama and the surrounding country. It consists of sixty or seventy large, roomy and airy buildings, and contains inside the grounds its own waterworks, drainage system, slaughter-houses, dairy, drug-stores, &c., so that in case of any epidemic the hospital could be shut entirely out from communication with the low-lying city of Panama. Patients unable to pay are treated free in the same manner as those who are able to pay for their accommodation. At Colon there is a smaller hospital under similar management.

Now as to the feasibility of finishing the canal, and the difficulties to be overcome. The latter naturally resolve themselves into two classes, relating to the engineering and the financial features. As far as I could see, the engineering plans seem feasible and the obstacles such as might readily be sur-

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mounted. The chief difficulties encountered are:—(1) The prevention of the Rio Chagres from overflowing its banks during high waters and flooding the canal; and (2) the Gulebra cut.

The Rio Chagres is a mountain stream, having its headwaters in the Andes, which the canal crosses at Culebra. Like all mountain streams, it is treacherous. In the dry season, and under ordinary circumstances, it discharges about 500 cubic feet of water per second. In the rainy part of the year, which lasts from six to eight months, during which time daily heavy rainstorms occur, the discharge of water per second rises to 20,000 cubic feet or more; it has even been known to reach the enormous quantity of 65,000 cubic feet per second, with a rise of the water to 45 feet above its normal level. The watershed drained by the Chagres, as far as it can influence the canal, is not very large or of much importance. The extreme high waters are caused by the heavy tropical rains. In order to protect the canal from such an enormous inflow of water from the river, which of course would soon destroy it and its usefulness, two plans have been proposed by the French engineers. The first one is to dam the Chagres at such a point as will retain the water, during rainstorms, long enough to permit the discharge to be controlled to its normal flow. The other is to change and enlarge the channels of the river, so that the water during the high floods will be discharged at a distance far enough away from the canal to secure its safety. Neither of these plans, so far as I understand, has been based upon accurate surveys or calculations. Upon a casual examination, the first one—damming the Chagres—seems to me the most feasible, and probably the least costly.

After passing Matachin the river turns in an easterly direction, leaving the canal, and at Gamboa passes between two mountains—Cerro Obispo and Cerro Santa Cruz. Here it is proposed to construct the dam, which would probably be about 5,000 feet long and 150 to 160 feet high. An outlet of the water from the dam by a tunnel through Cerro Azul, to the left of Cerro Santa Cruz, is also proposed. The storage capacity of the reservoir behind the dam is claimed by M. de Lesseps's engineers to be somewhat like 105,900,000,000 cubic feet. The cost of the dam is estimated at about 1,600,000 dols. To build such a dam, with its tunnel outlet and laterals, probably may at first seem an enormous undertaking. Its construction in point of engineering would, I fully believe, offer no insurmountable difficulties.

The Culebra cut is situated about nine miles from Panama.

Its total length is about two miles, and the highest elevation, as already noted, is 323 feet above the sea level. It has lately been proposed to tunnel through the highest portion. A French engineer has proposed recently to construct a lock on either side of the cut, so that it would only have to be excavated to a depth of 75 to 80 feet. This latter plan would undoubtedly save much time and labour, and probably also decrease the cost. But it would deprive the canal of one of the principal points in favour of its construction—that of making it a tide-water connection. The cut would require about 24,000,000 cubic yards of excavation, of which the greater part is rock. Nearly all the excavated stuff could be utilised in the construction of the dam across the Chagres. I do not see any great difficulty in taking out the whole cut as originally proposed, aside from the time and labour it requires, and even that would be materially less than anticipated by the French engineers if the work were conducted properly and honestly. Some work has already been done in the cut, but none at the dam besides some preliminary examinations.

It has also been argued that the question of labour as well as the unhealthful conditions on the isthmus would prove a serious difficulty to overcome in finishing the canal. Undoubtedly the French, while they pursued the work, had much trouble in regard to labourers. The chief cause of this was that the French contractors picked up many of their labourers from the slums of all countries. These men were unaccustomed to this kind of work and also to the climate. In many cases they did not desire work, but came out to the isthmus simply for the sake of adventure. Their past lives and environment made them an easy prey to disease, and they consequently increased the death-rate, always heavy among the unacclimated in a tropical climate. If the work were to be taken up to-day, I believe that any number of native labourers could easily be had, if not from the isthmus itself, from the surrounding South and Central American republics, and from Jamaica, &c. These labourers, mostly negroes, are strong, healthy and good-natured men, accustomed to work in the tropics. Their chief fault is laziness, but, properly managed, they would soon get over that, and prove to be very efficient and cheap workmen. There has been no yellow fever on the isthmus for several years, but only sporadic cases of intermittent fever. As the work on the sections of the canal through the swamps and marshes has been finished, it is not supposed by the natives that any great amount of illness would be caused by the renewal of work on higher ground.

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As to the financial question, I must, as an engineer, hold aloof from saying anything about the probable cost of finishing the canal. It would simply be guesswork with the time at my disposal, and management by guesswork has already proved a costly feature in the history of the Panama canal. It should be remembered, however, in this connection that although vast sums of money have been expended, and much of it uselessly, about half of the canal is finished, or very nearly so, and a large, valuable and well-kept construction-plant, machinery, materials and buildings, &c., are on the place ready for work. Before the work is taken up anew it is an essential necessity that the present company should be thoroughly reorganised under good and honest management. It is also absolutely necessary to have an accurate examination, survey and estimate made by competent engineers of the work already done and what remains to be done, as well as of the stock, machinery and materials on hand, upon which to base future financial calculations.

The watchword of the new management should be efficiency and honesty. The French management was rather "a white elephant" upon the company's hands, more elaborate than useful. All the officers necessary on the isthmus would be a competent, honest chief engineer, with an equally competent engineering staff, and an efficient, honest general business manager.

THE BETTERMENT QUESTION.

MEETINGS of the Association of Municipal Corporations were held in London while the subject of betterment was under the consideration of a select committee of the House of Lords. Two reports were prepared, one by the Mayor of Crewe as representing the opinion of the majority, and a second by the Deputy Town Clerk of Liverpool containing the views of the minority.

The committee recommended the Association to receive both reports of the committee as ably representing the arguments for and against betterment, and to adopt that of the majority as indicating the possibility of practically and beneficially applying the principle on just and equitable lines. The committee, however, admitted that there is still much to be learned from actual experience, and they therefore make their recommendation tentatively and with the object of the municipalities gradually building up an approximately perfect system

(as has been the case with so much legislation affecting the various localities of the country), from the comparative views, work and experience of different districts. The question of the taxing of ground values was reserved for further consideration.

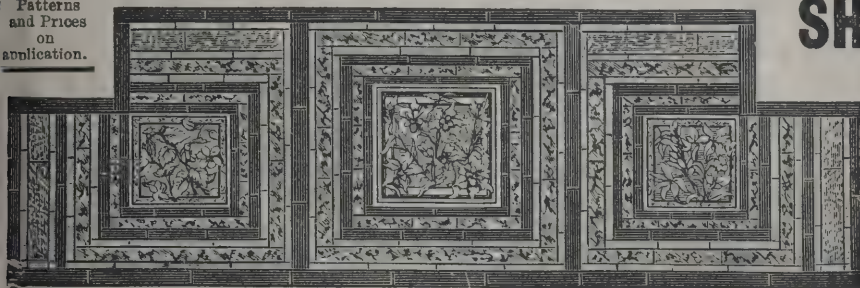
The following is the report prepared by the Mayor of Crewe :—

Where improvements are effected at the public cost which substantially and permanently increase in value any particular property, such increased value, or a portion of it, should be secured to the public authority by whose outlay the increased value is created. This is in broad and general terms a definition of the principle of betterment. To take an example, which has been mentioned by a member of this committee, the town council of a borough in the South of England have recently at a considerable cost purchased and demolished one side of each of two narrow streets, and have converted them into broad thoroughfares. In addition to the general benefit in the way of traffic facilities which this improvement has conferred on all the members of the community, the individual owners of most, if not all, of the property fronting to the other sides of these widened streets have received a special benefit, inasmuch as their property has been greatly enhanced in value. Those who believe in the principle of betterment say, in a case of this kind, that in addition to the general contribution by way of rate levied on all the inhabitants, the individual owners so benefited ought, in consideration of their special benefit, to make a special contribution to the funds of the public authority, and ought not to appropriate the whole of the enhanced value. To this general proposition almost everyone assents, but as to the proper machinery for carrying the principle of betterment into effect there is a very wide diversity of opinion. It is as to this practical application of the principle of betterment that we have to report.

Several schemes for carrying out this principle have been suggested by members of this committee, but as the mere outlines have only been given, it is thought that, in the absence of the detail so absolutely essential in a case of this kind, no useful purpose would be served by reporting on them. One at least of such schemes will, we understand, be brought before the Council of the Association in a separate report.

However, in the Tower Bridge Southern Approach Bill, and in the Manchester Corporation Bill now before Parliament, this abstract principle of betterment has been reduced to concrete form, and we accordingly propose to deal with the betterment

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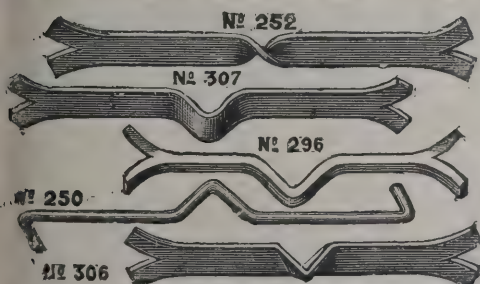
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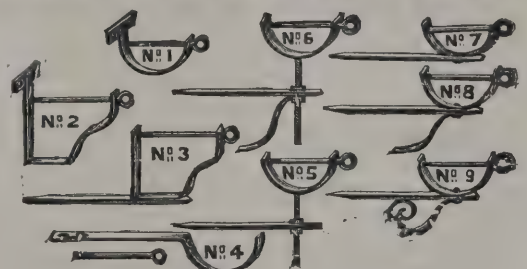
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provisions of these Bills (which are practically identical), and with the objections which have been raised to them.

We may say, by way of preface, that the London County Council have in previous years introduced Bills to Parliament in which betterment clauses have been inserted. These clauses have been extensively criticised in the Press, and have gone through the ordeal of a powerful opposition before committees of the House of Commons. The betterment clauses in the present Bill have been carefully and deliberately framed in view of the experience so gained, so that, whatever their demerits, they are no crude, hastily considered, or badly drafted proposals. The two Bills referred to have both passed the second reading of the House of Commons without a division, and, with certain amendments not affecting the principle of betterment, have now passed the committee stage. These betterment clauses have the support of a large majority of the London County Council, and practically the unanimous support of the Manchester Corporation. In the House of Commons they have the support of men of all parties, including Sir William Harcourt, Mr. Balfour and Mr. Chamberlain. We mention these facts, not as any reason why this Association should support these proposals, but only to show that they are approved by eminent and intelligent men who have studied the question; that they are not the absurd or revolutionary proposals which some critics would have us believe, and that they should not be dismissed or disapproved by this Association except upon very careful and impartial consideration.

I.—As to the Betterment Provisions in the Bills above referred to.

In the plans accompanying the Bills, an area is defined which may be called "An Area of Inquiry as to Betterment." Most of the adverse criticism of the Bills arises from a misunderstanding as to the meaning and object of this area, and it is very desirable, therefore, that this point should be properly understood. It is not an area within which every property is to be specially charged, but an area within which there shall be an inquiry as to whether or not any particular property has been benefited by the improvement. The limits of this area will have to be stated in their plans by the Council applying for the Bill, and, as part of the Bill, must of course be approved by Parliament. The necessity for this defined area arises solely from the Standing Orders of the Houses of Parliament relating to private Bill legislation, which require that a separate notice should be given to every individual interest affected by a

private Bill, so as to afford the person affected the opportunity of appearing and being heard in opposition. The boundary of this area will vary in each particular case according to circumstances, but it should no doubt be wide enough to include every property which may be specially benefited by the improvement. It is obvious that wherever the limits are placed there are certain to be properties within it which are not benefited; but in view of the fact that it is simply an area of inquiry, and not an area of taxation, this is unimportant. Within the area so defined as aforesaid, any property not taken by the Council is liable to be charged in respect of any substantial and permanent increase in value which it is clearly shown has been or may be derived from the improvement.

The course of procedure to fix the charge (if any) to be paid by the owner is as follows:—Before the improvement is commenced some independent person is appointed by the Local Government Board to make a valuation of such property in the area as shall be specified by the Council, such valuation to be independent of the improvement, and as if it had not been contemplated. The object of this valuation is of course to obtain and record evidence of the value of the property before the improvement. After the improvement is carried out (but not later than seven years from the passing of the Act) the Council is to make an assessment on such of the properties comprised in the valuation as they consider to have been enhanced in value. This assessment is to contain a statement of the amount of such enhanced value, and the charge to be placed on the property is 3 per cent. upon one-half of this amount. If, for example, the estimated enhanced value is 1,000*l.*, the betterment charge would be 3 per cent. on 500*l.*, i.e. 15*l.* per annum. Under subsequent provisions this betterment charge may be redeemed at any time, so that if the owner prefers to pay his 500*l.* down he can do so. If he prefers to postpone payment of the amount due, he is charged until payment the moderate interest of 3 per cent. on the capital sum due from him. The assessment abovementioned is to be advertised in the newspapers, and served on the parties interested. If any owner objects to the assessment in his particular case, he is to give notice to the Council of his objection. The Council may accept the objection, and alter the assessment in his particular case, but failing an agreement, the Council applies to the Local Government Board to appoint an arbitrator to decide the dispute. The decision of this arbitrator is final, but he may state a special case to the high court on any question of law. The arbitrator is to consider the different interests in the property, and is to

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There are a number of subsidiary provisions, but we believe the above gives a fairly accurate outline of the betterment clauses as they at present stand. To the municipality and to the ratepayers generally the advantages of these clauses are obvious. They intercept, on its way to the owner of property benefited by the improvement, one-half of the value which he derives from it. To this owner there is no injustice, as he still obtains as a gift from the public, and as an addition to the existing value of his property, one-half of the enhanced value, while to the general ratepayer there is the advantage that the cost of the improvement is materially lightened. Briefly, these betterment clauses are a method to take a portion of the profit of the few who are specially benefited to lessen the burden of the many who receive no special benefit. Naturally enough, the few prefer the present system, which allows them to take the whole profit of the improvement, and, represented by able counsel, they have strenuously opposed these Bills in committee.

It may be taken for granted that no Bill was ever introduced into Parliament against the passing of which some reason could not be adduced. These betterment provisions are no exception to the rule; but, while we admit the ability and plausibility of the opposing arguments, yet we venture to think that the weight of argument is strongly in favour of the provisions.

II.—As to the Objections to the Betterment Proposals.

1. It has been urged that under the existing law the owner of an improved property pays a betterment charge. It is said that if by reason of a public improvement a given property rises in value from, say 100*l.* to 200*l.* a year, the rating assessment of the owner will rise also, and that the increased rate thus paid in respect of the property is a sufficient contribution to the cost of the improvement. With this proposition we do not agree, and we think that a slight consideration will show that it is fallacious. All property is liable to be rated in any event, and all rates are simply a payment by the individual for definite services (such as sewerage, lighting, watching, paving, &c.), rendered to him in common with all other members of the community. In other words, payment of a general rate is

a payment for general services rendered, and in no sense can it be considered as a payment for special benefits such as are contemplated in the betterment proposals. To take an example, we cannot agree that when by the expenditure of public money a property is raised in value from 100*l.* to 200*l.* a year, that the extra rate paid by the tenant of the property is a sufficient contribution from the owner in respect of the 100*l.* a year which the improvement has placed in his pocket. Argument may obscure, but it cannot alter, the fact that such owner gains a 100*l.* a year, and the betterment proposal is that one-half of the gain should go towards the opening of a new street; a plot of land which had formerly an agricultural value, say 100*l.*, becomes available for building purposes, and is sold for 500*l.* to a purchaser who erects a house on it. The vendor has put into his pocket 400*l.* created by public outlay, and we think it clear that the rate which the purchaser pays on the house which he erects on the land is in no way a betterment contribution by the benefited vendor. We consider that the payment of increased rates by the tenant can in no way be considered a betterment contribution by the owner, and, therefore, that in asking for such a contribution from the owner he is not being "taxed twice over" as alleged.

2. Another prominent objection is stated by the opponents of betterment somewhat as follows:—"It is true that a public improvement benefits some property and increases its value, but it is also true that, by reason of the diversion of traffic into the improved street or like causes, other property is damaged and decreased in value. If, therefore, you are going to make people pay for 'betterment,' it is a necessary corollary to the proposition that you should pay others for 'worsement.' Your Bill contains no provision for payment for worsement, and therefore we object to it." At first sight this appears to be a very good objection, but it vanishes on a closer and more careful inspection. In the first place it should be clearly understood that by Sect. 68 of the Land Clauses Consolidation Act, any person affected by the execution of the works is entitled to compensation for any damage he may sustain thereby. Thus, for example, if the level of a street were raised, and a property fronting to it is thereby damaged, it is clear that, under the present law, the owner could obtain compensation. The contention of the objectors, if carried to its logical conclusion, is that compensation should be given, not merely to owners who have had the property damaged by the carrying out of the works, but to owners in adjoining streets, who allege that by the diversion of traffic to the new street their



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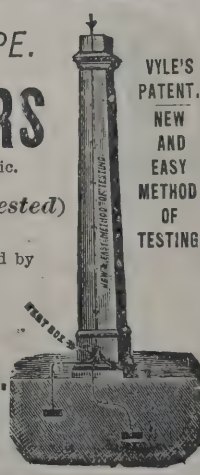
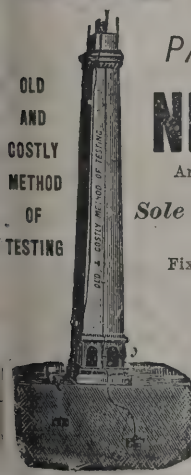
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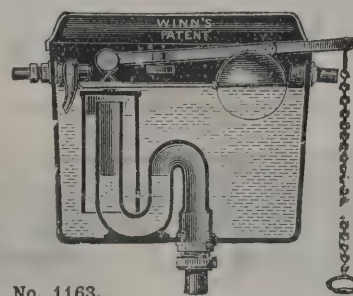
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property has been depreciated. Let it be granted that it occasionally happens that property in a street adjoining an improvement is depreciated by the diversion of traffic. This evil, if it be one, is an evil which exists under the present system. Does any one seriously propose at the present time that the owner of property depreciated by alteration of traffic should be compensated? We believe that no one acquainted with municipal work would ever make such an impracticable proposal. As we have said, this grievance, if it be one, exists at the present time, and from the fact that no legislation has ever been proposed to remedy what we are told is a crying evil, we conclude that this class of depreciated property owners is by no means so numerous, nor are their grievances so great as the opponents of the Bills would have us believe. It should also be borne in mind that at the present time such an owner not only has his property depreciated, but in his rate he has to contribute to the full cost of the public improvement which injuriously affects him. By the application of the betterment principle, at any rate a portion of this burden will be taken from him and placed on the shoulders of his more fortunate neighbour. Whatever therefore the betterment principle may do, it will at any rate improve the present value of the depreciated property owner. Moreover, even granting that this depreciated property owner has a grievance, this is no reason whatever why a totally distinct grievance, viz. that improved property owners do not contribute to the cost of the improvement which enriches them, should not be at once remedied. We do not think, however, that any depreciated property owner has a grievance which is not met by the existing law. If his property is injuriously affected by the works he can get compensation, and to compensate for mere change of traffic is impracticable, as indeed most of those who bring forward the objection admit. If it were a reasonable, necessary and practical proposal, it ought to have been introduced into every Improvement Act which has ever been passed. We believe that the proposal is as unnecessary as it is impracticable, and we fail to see in it any reason for not attacking a grievance vastly greater, and which is certainly capable of remedy.

3. A number of cases have been stated to us where the effect of a public improvement has not been to better the adjoining property. That cases of this kind happen is of course known to us all, but we fail to see that this affects the question in any way. If it were proposed to charge all the property in a given area, this objection would certainly have weight, but as it is only proposed to charge those properties in

the area which are "substantially and permanently increased in value" it falls to the ground.

4. It is said that under these clauses it is proposed to put a permanent charge on the land for what may be a temporary and evanescent improvement. If it be granted that it is just that an owner whose property is enhanced in value 1,000% by a public improvement should pay 500% towards the cost of it, it is surely no hardship if for his own convenience the payment is postponed, and he is charged 3 per cent. interest in the meantime.

5. It is said that the cost of assessing the charge will be out of all proportion to the benefits to be received from it, and figures are given showing the estimated costs of an arbitration over each assessment. All this is based on the assumption of the very improbable fact that all the assessments of the council will be appealed against. We say, however, that appeals against the ordinary rating assessments form a very small percentage of the whole, and even in compulsory purchases under the Land Clauses Act it is not one case in twenty that goes to arbitration. We have some ground, therefore, for thinking that appeals to the arbitrator will not be a common occurrence, and that the assessment to the authority will not be excessive.

6. It is said that the betterment charge will be uncertain and arbitrary, and at the best will be a mere guess on the part of the valuer. We do not think it is impracticable or even difficult for a competent valuer to fix the value (*i.e.* what it is likely to fetch in the market) of any given property. This is done by valuers every day with every kind of property, and for various purposes. The difference between the value before the improvement and the value after is to form the basis of the betterment charge, and we do not think the valuer will have any great difficulty in arriving at it. The mental process which every valuer goes through may be called "guessing," but it does not alter the fact that the guesses of a valuer are reasonably and approximately correct, and that ordinary rating assessments are at present fixed by exactly the same method.

7. It is urged that municipal authorities have an easy method of securing the betterment by what is known as "recoupment," *i.e.* by purchasing more land than they actually require, and then by its sale after the improvement is completed recouping themselves for its cost. This scheme has been tried, and has, generally speaking, failed, the reason being that in buying the extra property the municipality has to pay not only for land and property which they can sell again, but

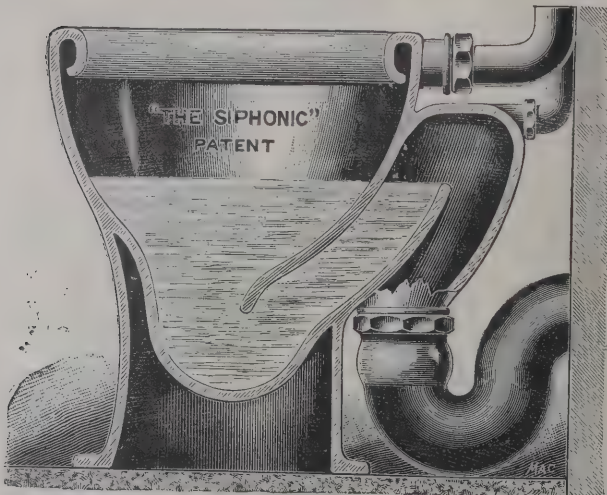
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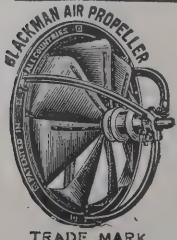
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also for compensation for disturbed trades and businesses, for which there is no return.

8. It is said that the betterment principle places an undue opportunity for jobbery in the way of the members of the Council, and that a member may bribe them to under-assess his particular property. The possibility of jobbery is bound to exist in many departments of municipal work, but we think we have reason to hope that the actual crime is of rare occurrence. It is unlikely that any owner could bribe or influence the majority of the members of a Council to under-assess him, and as the assessment is publicly advertised, any unfair dealings would immediately come before the public eye. The ordinary assessment for rating purposes is financially much more important than betterment assessment will be, and as one seldom, if ever, hears of jobbery in the one, we have reasonable hope for its absence in the other.

9. It is objected that the principle of betterment is a new fangled one. Even if this were true, it is clearly no good objection in itself. If the principle is just and equitable, if its application is expedient and practicable, it should become law whether there is any precedent for it or not. It is, however, by no means a new principle. In the Statute 13 & 14 Charles II. cap. 2 (which authorised certain street improvements in the City of London), after reciting that "the houses that shall remain standing on the other side of the said street or streets, or behind the said houses that shall be so pulled down as aforesaid, will receive much advantage in the value of their rents by the liberty of air and free recourse for trade and other conveniences," it is enacted that "in case the owners and occupiers do not agree and compound with the commissioners for the same, that a jury shall be empanelled to judge and assess upon the owners and occupiers of such houses such competent sum or sums of money or annual rent in consideration of such improvement as in reason and conscience they shall judge and think fit." The principle of betterment was thus recognised as a just one over two hundred years ago, and has in various forms been embodied in subsequent legislation. One of the latest examples is to be found in the Housing of the Working Classes Act, 1890 (53 & 54 Vict. cap. 70, sect. 38), which provides that where any building stops ventilation to other buildings so as to make the latter injurious to health, such obstructive building may be acquired and demolished, and where such demolition adds to the value of the adjoining property, a special charge may be laid on such property by way of improvement rate. See also section 41 (2 b) of the

same Act, which provides that in settling the amount of compensation to be paid for property taken for the purposes of the Act, the arbitrator is to have regard to any increased value given to other property of the same owners by the alteration. While we do not consider the question of precedent an important one, we are nevertheless satisfied that the principle of betterment has been frequently embodied in enactments of the legislature.

There are numerous other minor objections and difficulties which we have considered, but which would take too much space to deal with in detail.

It would of course be impossible to devise any plan of dealing with this betterment principle which would not be open to some real objection, and it is certainly hopeless to expect that any scheme could be propounded which would not be capable of being represented by clever opponents as fraught with numerous more or less imaginary perils. We do not say that the betterment proposals in the Bills now before Parliament are perfect, or that their working will be attended with no difficulty. We do say, however, that they are fair and reasonable proposals for carrying into practical application that principle of betterment in which most of us believe. In the smaller towns especially, really necessary public improvements are often barred by the cost, and as the adoption of the betterment principle seems to us the means of lightening the general burden without doing injustice to anyone, we believe that it will be an important aid to municipal progress and development. The London and Manchester proposals are the only concrete form in which the betterment principle has been expressed, and we consider that it will be a matter for regret if they do not pass into law. It has been the practice of this Association to encourage reasonable experiments in municipal government, and even to take no higher ground than this, we think the influence of the Association should be exerted to secure the passing of these Bills. It is through knowledge gained by experiment that most of our municipal progress has been made in the past, and it must be so in the future. These are not public Bills, which, if passed, will bind all municipalities; they are private Bills affecting only particular corporations, whose example in their betterment proposals we may either follow or avoid according as the result of their experiment indicates. Should these clauses work well, as we believe they will, they may (grafted, perhaps, on to powers for the more easy compulsory acquisition of land for municipal purposes) be the foundation of some future Act of

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Parliament applicable to the country as a whole. On their own merits, however, and as a practical application of the principle of betterment, we commend them to the general approval of the council of this Association.

(To be concluded.)

THE ANCIENT IRISH CHARCOAL IRON INDUSTRIES.

IN prehistoric times Ireland was, the *Irish Times* says, noted for its superior iron. "The annals" suggest that one of its exports in Phœnician time was iron to be used in the manufacture of the famous Damascus steel. This, however, cannot be stated positively; we must, therefore, come for undoubted record to more recent time. Irish iron was evidently prized in Strongbow's time, as two of his knights, De Raymund and De Silbery, started as rival ironmasters in Cathan, now a portion of the county Wicklow, the remains of their old castles being found on the old horse trail between Arklow and Shillelagh, while the remains of a very peculiar iron works, said to have belonged to one of these knights, was cut through while constructing the new "Van Road" from Rathdrum to Aughrim. The manipulation of the iron ore must have been quite distinct from any modern system, as associated with this old mine are numerous bulton or rock basins in blocks of granite, these basins being from 1 to 2 feet in diameter and from 1 to 3 feet deep, evidently being mortars in which the ore was pounded up. It has been suggested that these primitive iron smelters pounded up the ore with charcoal and smelted it in crucibles. This is extremely probable, as iron is smelted somewhat similarly in parts of Africa, while in places in the county Donegal are found saucer-like masses of slag—ejecta from crucibles.

To come, however, nearer to the present time—Chichester, in his report, 1609, states he found in Ulster native smiths at work making steel out of the native iron, "which they wrought much more easily than it could be made in England." After Chichester's report there was an inundation of English adventurers, as recorded in 1646 by Gerard Boute.

The Boyles (Lord Cork) started mines, furnaces and mills in divers places in Munster; the Whites in divers places, co. Cork; the Wandesford in Carlow and Kilkenny; Sir Charles Coot (Cootes of Mountrath), who seems to have been the largest manufacturer in the Queen's County, Leitrim and Roscommon; Lord Londonderry, in the Queen's County; Lord Ely and Mrs. Pigott in the King's County; Dunbar

and Blennerhasset in Fermanagh; a London company on the Lower Shannon (counties of Limerick and Clare); Petty (ancestor of Lord Lansdowne), Kerry; Lord Stafford, Wicklow and Carlow; Sir Walter Raleigh, Waterford; and in more recent times Rennie in Londonderry and Tyrone; Bacon and Chamney, counties of Wicklow and Wexford; the Beeches, of Marble Hill, Woodford, Galway; Bradys, Tomgrany, co. Clare; Gildeas, Port Royal, co. Mayo, and others in Tipperary and elsewhere, where iron mines occurred. The names, however, mentioned, are sufficient to show what an important industry this iron trade once was; but in connection with this statement, it should be remembered that this iron was "charcoal iron," similar to the present far-famed Swedish iron. Gerard Boute, writing in 1646, pointed out that the Irish woods were nearly exhausted, most of them having been burned down by the English after the rising in 1640, and that the ironmasters must turn their attention to manufacturing charcoal from peat. This they did not do, and as the woods disappeared so did the furnaces, till the last was put out at Shillelagh about 100 years ago.

In Sweden, whose iron replaced the Irish supply, the woods are now becoming exhausted, but these, more foreseeing than the old Irish iron manufacturers, are taking time by the forelock and are substituting peat for wood charcoal. The question therefore is, if they can use peat charcoal why cannot the same thing be done in Ireland, where there are real peat accumulations and unlimited iron veins?

This is a subject that ought to be of special interest to all the descendants of the old ironmasters or others that have succeeded to their former properties. Of course, in some places the bogs have now disappeared in the vicinity of the iron veins and deposits. This, however, is a secondary consideration, because if iron is required at a furnace it must be procured—thus Dutton, in his history of Galway, states the iron came up the Shannon to the furnaces on Lough Derg. Bacon, of Shillelagh, made his money that way, importing English iron. His son-in-law, Chamney, developed the trade by opening mines in the vicinity.

Particulars as to the names of these different ironmasters and the localities where the iron was raised and smelted, also the sites of the iron mills, are given in the "Economic Geology of Ireland," vol. viii., new series, Journal Royal Geol. Soc., Ire., in the section on metal mining. To these lists, &c., those interested in the subject may be referred.

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interest, as a company is now formed to attempt to reintroduce the manufacture of charcoal iron in the province of Connaught, at Sir Charles Coote's old mines of Creevealea, co. Leitrim, where some of the richest ores are located.

Up to the present time the manufacture of charcoal iron seemed to be an impossibility on account of the prohibitive price of peat charcoal. This impediment, however, seems now to be surmounted by the "Rose retorts," as an excellent charcoal can be manufactured at a small price, while the by-products (sulphate of ammonia, &c.) can also be saved, thus materially reducing the cost price of the charcoal.

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The Mercers' Company for some years past had felt the necessity of transferring their school, at present situated at College Hill, to a more modern and convenient building, but considerable difficulty was experienced in finding a suitable site for the new school within the City boundary. In 1892, however, the company, through their surveyor, Mr. Daniel Watney, purchased the site of Barnard's Inn, Holborn, an area of 27,000 feet superficial, including the buildings standing thereon.

Amongst these buildings was the old Inn Hall, which the company decided to retain and make it part and parcel of the new school premises. In Maitland's "History of London," 1775, it is stated that the Inn was founded on this site in 1454.

The new school is a handsome building, faced with red bricks, with Ancaster stone dressings, but unfortunately it is largely hidden from view, as the entrances both from Holborn and Fetter Lane are so narrow. There are two entrances to the main block of buildings, and one of these is surmounted by a clock tower, in which a clock has been placed through the generosity of one of the members of the court of the company.

Approaching the building from Holborn it will be noted that the old Inn Hall has been retained and redecorated to be now used by the boys as a dining-room, and with this object kitchens, sculleries, &c., have been built in close proximity.

The head-master's room is adjacent to the dining-hall, and then the main block of buildings follow, with its large assembly-hall on the ground floor—a room 70 feet by 40 feet—with an arcade on its western side. On the same floor a large lecture-room is provided, and also the physical laboratory and science

master's room, and a special classroom for the head-master, Dr. Scott.

On the first floor are six large classrooms, and the second floor has a similar number. These rooms are lofty, and all well lighted from the left-hand side, with glass screens to the corridors. They are fitted with open warm-air stoves, and the larger rooms and all the staircases and corridors are heated with low-pressure hot water, which is also used for extract purposes in a large trunk placed on the roof. Under the lecture-room block a covered playground has been provided for the boys' use in bad weather.

A separate building of three floors, placed backing into Fetter Lane, contains the chemical laboratory and the drawing school, both of which are being fitted up with all the modern appliances.

The whole of the buildings are fireproof throughout, and they have been fitted both with fire hydrants and with the electric light, no gas-mains being introduced into the premises. The total accommodation is for 300 boys, exclusive of the lecture-room, laboratory and drawing school. The classrooms are being fitted with single desks, and a separate locker is provided for every boy's hat and coat. The drainage has received special attention, and the whole of the laboratories are situated in a distinct building in the playground.

As before mentioned, the site was bought by and all necessary arrangements with adjoining and other owners made by the surveyor to the company, Mr. Daniel Watney.

The builders who have carried out the works are Messrs. E. Lawrance & Sons, of Wharf Road, City Road, from designs prepared by Mr. T. Chatfield Clarke, F.R.I.B.A., under whose personal direction and that of his son and partner, Mr. Howard C. Clarke, the buildings have been erected. Mr. J. P. King has acted as clerk of the works.

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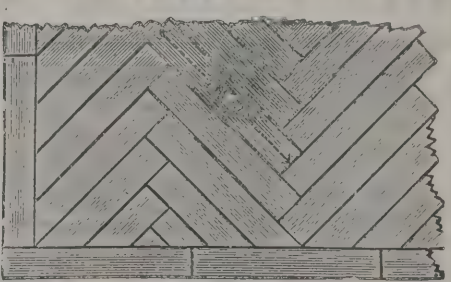
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Bradford Town Hall	Crawley Parish Church
St. James's Palace, London	Corbridge-on Tyne Parish Church
Sherborne Abbey	Windermere Church
Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
	Eiffel Tower, Paris
	Royal Military Exhibition, &c., &c., &c.
	GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
	SILVER MEDAL—PARIS, 1889.

SCOTT, J. J. L., 12 Little College Street, Chelsea, S.W.
TAYLOR, F., 150 Iverson Road, West Hampstead, N.W.

Provincial Masters.

CUTHBERT, G., 40 Union Street, Brechin, N.B.,
and
ROWLANDS, A., 59 Plein Street, Cape Town, South Africa.

Provincial Journeymen.

BROWN, J. H., 79 Clarendon Road, West End, Morecambe.
CHARLES, W. R., 26 Cromwell Road, Plymouth.
CUTHBERT, W., Vains Park, Brechin, N.B.
DILLING, E. R., 62 Well Street, Plymouth.
FEATHERSTONE, E., 14 Hoe Street, Plymouth.
LEE, W. T., 7 Skardon Place, Plymouth.
MINHINNICK, R., 6 John's Street, Plymouth.
RAPE, W., 7 George's Square, Devonport.
RINGROSE, C. J., 43 St. Mary's Road, Sheffield.
SMITH, J. H., 12 Bridge Street, Leighton Buzzard.
TAYLOR, D., 30 Commercial Street, Perth,
and
KELLAWAY, E., Parliament House, Cape Town, South Africa.

THE fifth annual congress of the District Councils of Scotland in connection with the National Registration of Plumbers will be held at Inverness on the 18th and 19th September, under the auspices of the Provost and Magistrates of the burgh. The congress now announced will fittingly follow those held at Edinburgh, Glasgow, Dundee and last year at Aberdeen, under the auspices of the Corporation, the authorities of the colleges and chief citizens.

The Provost and Magistrates of Inverness were among the earliest health authorities in Scotland to officially recognise the great sanitary importance which attaches to plumber-work and house drainage being carried out by efficiently trained and responsible men, and they welcome the meeting in Inverness of the representatives of the plumbers and the sanitary authorities of Scotland, to consider practical measures for securing these objects and promoting those good relations which they are convinced should always subsist between those engaged in works intimately connected with the health and comfort of the community.

The following are the most important of the subjects which will be discussed during the congress:—

1. Publication of the model regulations concerning plumber-

work and house drainage which have been formulated since the last year's congress.

2. The importance of practical workmanship, and the extension of technical instruction classes for plumbers under municipal and county authorities.

3. The promotion of the Plumbers' Registration Bill in Parliament.

4. The Exhibition of Sanitary Apparatus and Teaching Appliances, &c., which will be opened in connection with the congress.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

16344. Alfred Edward Dawes, for "Improvements in fastenings for window sashes."

16345. Fred Walter Cashmore, for "Improvements in window-sash fasteners."

16396. Morris Ford Smith and Horace Pettit, for "An improved observation tower."

16457. William Cowper, for "Improvements connected with ranges, fire-grates and the like."

16458. Robert Frame, for "Improved means for opening sash windows."

16462. William Hodgson, for "Improvements in the construction of water-closets."

16480. John Halse and Oliver Reece, for "Improvements in sash fasteners, also applicable for doors and the like."

16564. Edward Clare, for "Improvements in fasteners for sashes, sliding doors and the like."

16577. Thomas Robb, for "Improvements in and relating to the lowering and raising of windows."

16646. Samuel Daw, for "Improvements in and relating to window-sash fasteners."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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84 Brook Street, Grosvenor Square, W.: December 8, 1893.

Sir WILLIAM BROADBENT encloses cheque for the "GRUNDY" HEATING APPARATUS supplied to his house, and is glad to say that has proved very satisfactory for warming and ventilating as required. The principle of the apparatus is most excellent.—To Mr. Grundy.

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October 24, 1893: Hind Head House, Haslemere.

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THE

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SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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TENDERS, ETC.

"As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

THE SURVEYORS' INSTITUTION (Incorporated by Royal Charter), 12 Great George Street, Westminster.

EXAMINATIONS, 1895.

PRELIMINARY EXAMINATION.

Notice is given that the Preliminary Examination for the admission of Students will be held on January 23 and 24 next.

It is proposed to examine Candidates from the counties of Lancashire, Cheshire, Yorkshire, Durham, Cumberland, Westmoreland and Northumberland, at Manchester. Candidates from other counties in England and Wales will be examined in London.

PROFESSIONAL EXAMINATIONS.

Notice is also given that the Annual Professional Examinations for Land Agents, Valuers and Building Surveyors (held under the provisions of the Charter), qualifying for the Fellowship and Associateship of the Institution, will commence on March 11 next.

Candidates for the Professional Examinations are examined in London only. Particulars as to subjects, course of examination, prizes and scholarships can be obtained of the Secretary.

All applications for the Professional Examinations, Divs. II., III., IV., and V., must be sent in before October 31 next, and applications for the Students' Preliminary Examination before November 30 next. The necessary Entry Forms for the various Examinations can be obtained of the Secretary.

CONTRACTS OPEN.

ABINGDON.—Oct. 9.—For the Erection of Twenty-four Artisans' Dwellings. Mr. J. G. T. West, M.S.A., The Knowl, Abingdon.

ASHEBURTON.—Sept. 27.—For Building Police Station. Mr. E. H. Harbottle, County Surveyor, Exeter.

BRIGHOUSE.—Sept. 22.—For Building Brick Chimney (45 Yards high). Messrs. Jackson & Fox, Architects, 22 George Street, Halifax.

BASFORD.—Oct. 22.—For Erection of Buildings for Infectious Diseases Hospital. Mr. Herbert Walker, Architect, Newcastle Chambers, Nottingham.

BELPER.—Oct. 1.—For Alterations at Pottery. Mr. Maurice Hunter, Architect, King Street, Belper.

BRIGHTON.—Sept. 28.—For Erection of Refuse Destructor Buildings and Chimney Shaft. Mr. Francis J. C. May, Town Hall, Brighton.

BURNLEY.—Sept. 25.—For Buildings and Chimney at Outfall Sewage Works. Mr. F. S. Button, Borough Surveyor.

BUXTON.—Sept. 27.—For Alterations to Endowed Schools. Mr. W. R. Bryden, Architect, 1 George Street, Buxton.

CARDIFF.—For Building Large Mission Hall. Messrs. Habershon & Fawcner, Architects, Pearl Street, Cardiff.

CARDIFF.—Sept. 21.—For Erection of Exhibition Buildings. Mr. Edwin Seward, Architect, Queen's Chambers, Cardiff.

CRAWLEY.—Sept. 27.—For Additions to Crown Inn. Mr. Wm. Buck, Architect, 60 West Street, Horsham.

CHELMSFORD.—Sept. 29.—For Building Cottages. Mr. F. Whitmore, Architect, 21 Duke Street, Chelmsford.

DARENTH.—Oct. 1.—For the Erection of Fire Escape Staircases at the School for Imbeciles. Messrs. A. & C. Harston, 15 Leadenhall Street.

DORCHESTER.—Oct. 2.—For Building Isolation Hospital, Administrative Block, &c. Mr. G. J. Hunt, Borough Engineer.

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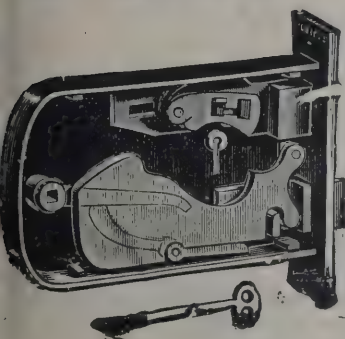
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DUBLIN.—Oct. 1.—For the Construction of a Refuse Destructor. Mr. Spencer Harty, City Hall, Dublin.

EDMONTON.—Sept. 25.—For the Supply of Broken Granite and for Steam Rolling and Scarifying the Roads of the District. Mr. Eeders Eachus, Town Hall, Edmonton.

GELLIGAER.—Sept. 22.—For Extension of Tirphill Board School. Mr. John Williams, Architect, Morgan Town, Merthyr Tydfil.

GREAT WESTERN RAILWAY.—Oct. 8.—For the Supply of Stores (Bricks, Tiles, &c.). Mr. G. K. Mills, Paddington Station.

GREENWICH.—Sept. 25.—For the Supply and Delivery of Paving Materials. Mr. J. Spencer, Clerk to Local Board, Greenwich.

HALIFAX.—Sept. 22.—For Building Board School for Infants. Mr. J. F. Waish, Architect, Waterhouse Chambers, Halifax.

HALIFAX.—Sept. 27.—For Building Two Wool Warehouses. Mr. Raymond Berry, Architect, Arcade Chambers, Halifax.

HALSTEAD.—Oct. 1.—For Building Isolation Hospital, &c. Messrs. Goodey & Cressall, Architects, 2 Victoria Chambers, West Stockwell Street, Colchester.

HENDON.—Sept. 24.—For about 1,574 Yards Run of Hassall's Double Lined 18-Inch Stoneware Pipes (including about 1,264 Yards Run through Fields); about 1,253 Yards Run of Hassall's Single Lined 15-Inch Stoneware Pipes (including about 527 Yards Run through Fields); about 120 Yards Run 15-Inch Cast-iron Pipe Sewer in Special Construction, together with Manholes, Lampholes, Flushing Chambers, Storm Overflows and Other Works in Connection therewith. Mr. S. S. Grimley, The Burroughs, Hendon, N.W.

LEEDS.—Sept. 24.—For the Erection of Ordinary Works and Repairs for Three Years for H.M. Office of Works. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

MIDLAND RAILWAY.—Sept. 29.—For Cleaning and Painting the Engine Sheds, Shops, &c., at Peterborough, Cleaning and Painting the Engine Sheds, Shops, &c. at Child's Hill. Company's Architect, Cavendish House, Derby.

PLYMOUTH.—Sept. 26.—For Heating and Ventilating Municipal Buildings. Mr. J. Paton, Municipal Offices, Plymouth.

REDRUTH.—Oct. 6.—For the Construction of a Storage Reservoir and Intake Works and the Supply, Laying and Jointing about Ten Miles Cast-iron Socket Pipes and Appendages. Mr. H. Bertram Nichols, A.M.I.C.E., 59 Corporation Street, Birmingham.

SAXMUNDHAM.—Sept. 21.—For Building Board Schools. Mr. John Fry, Solicitor, Saxmundham.

SEAFORD.—Oct. 3.—For Building Infants' School. Mr. W. Kent, North House, Seaford.

SHIPLEY.—Sept. 24.—For Building Cemetery Chapel, Lodge, &c. Mr. S. Jackson, Architect, Tanfield Chambers, Bradford.

SOUTH NORMANTON.—Sept. 24.—For Building Board School for Infants. Mr. J. T. Shardlow, Architect, Blyth Road, Worksop.

ST. GEORGE-IN-THE-EAST.—Sept. 21.—For Building Casual Wards, Old Gravel Lane. Messrs. Wilson, Son & Aldwinckle, Architects, 1 Victoria Street, S.W.

TOTTENHAM.—Oct. 2.—For the Erection of Boundary Fence Walls, Fences and Gates at North-Eastern Fever Hospital. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

WALSALL.—Sept. 22.—For Building Police Station. The Borough Surveyor.

WHORLTON.—Sept. 27.—For Additions to Schools. Mr. T. Leslie Anderson, Architect, 4 Royal Arcade, Newcastle-on-Tyne.

WILLESDEN.—Sept. 25.—For the Execution of Tar-Paving Works for Three Years. Mr. O. Claude Robson, Public Offices, Dyne Road, Kilburn, N.W.

TENDERS.

BRADFORD.

For Additional Wards and other Works at Bradford General Infirmary. Messrs. MILNES & FRANCE, Architects, Bradford.

Accepted Tenders.

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J. Thomas, Cardiff	210	0	0
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E. H. Page, Cardiff	156	15	0
F. Jackson, Cardiff	156	5	0
Batchelor & Snowden, Cardiff	140	0	0
H. A. S. FRASER, Partrid Road (accepted)	132	10	0

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For Tennis Court, Back Norfolk Terrace, Chapel Allerton.

W. Green, Garforth	£59	17	7
W. Limley, Leeds	58	0	0
F. Bywell, Kirk Hill, Horsforth	55	0	0
S. H. Self, Headingley	50	0	0
W. Clayton, Armley	35	0	0
C. Cokill, Leeds	31	10	0
E. Crossley, Chapel Allerton	30	15	0
J. Robinson, Chapel Allerton	27	18	4
A. Henson, Leeds	19	10	0

Note.—An alteration in the requirements having been made, the contract has been given to E. Crossley, Chapel Allerton, at £14.

CHELMSFORD.

For Building House, Broomfield Road. Mr. RD. MAWHOOD, Architect.

J. Smith & Son, Witham	£895	0	0
E. Saltmarsh, Chelmsford	837	6	6
E. West, Chelmsford	834	0	0
W. Samms, Ransford Road	815	0	0
W. FINCHAM, Baddow Road (accepted)	795	0	0

CHICHESTER.

For Sinking Well at Grayling Wells Farm for Proposed Asylum, for West Sussex County Council. Mr. W. SHELFORD, M.I.C.E., Engineer, Westminster.

DUKE & OCKENDEN, Littlehampton (accepted) . £524 0 0

CHRISTCHURCH.

For Men's Quarters and Cottage Homes at Workhouse, for the Christchurch Guardians. Mr. E. BURTON, Architect, Bournemouth.

A. King, Gloucester	£12,974	0	0
F. Hoare, Bournemouth	12,679	0	0
George & Harding, Bournemouth	12,524	0	0
Lucas, Bournemouth	12,027	0	0
M'William, Bournemouth	11,992	0	0
Jones, Bournemouth	11,370	0	0
Jenkins & Sons, Bournemouth	10,847	0	0
W. J. CHINCHEN, East Cliff Works, Bournemouth (accepted)	10,500	0	0
J. White (withdrawn)	8,750	0	0

CLUNGUNFORD.

For Restoration and Additions to St. Cuthbert's Church, Clungunford, near Craven Arms. Mr. EDWARD TURNER, Architect, Leicester.

Edwin Whittingham, Newport, Salop	£2,430	0	0
Henry Smith, Wolverley, Kidderminster	2,335	0	0

* Conditionally accepted.

CORK.

For Building Premises, Winthrop Street, for Mr. T. Donovan. Mr. W. H. HILL, Architect, 28 Southmall, Cork.

Delaney & Co., Cork	£600	0	0
Duggan, Cork	580	0	0
Kenefield, Cork	571	0	0
O'Leary, Cork	547	0	0
Johnson, Cork	543	0	0
T. O'FLYNN, Cork (accepted)	530	0	0

DEWSBURY.

For Farmstead and House at the Mitchell Laithes Farm, Earlsheaton, near Dewsbury, for the Dewsbury Corporation.

J. C. Wombell, Doncaster	£7,315	11	3
W. Scott & Sons, Dewsbury	6,038	19	11
Booth & Spedding, Earlsheaton	6,008	7	7
J. Audesley, Earlsheaton	6,051	5	4
M. SCOTT, Earlsheaton (accepted)	5,648	12	5

DONCASTER.

For Excavation for Sewers on the Line of New Road across the Town Field, for the Corporation of Doncaster.

J. NETTLETON (accepted).



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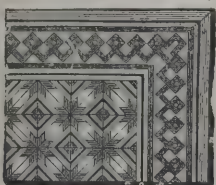
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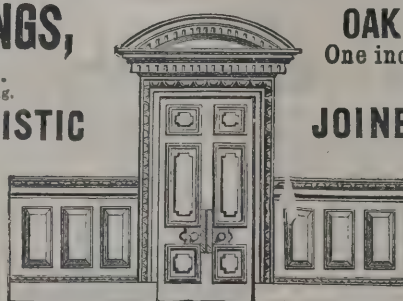
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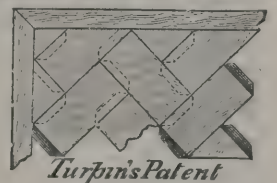
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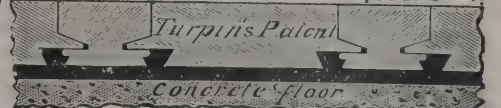
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DOVERCOURT.

For Building Primitive Methodist Chapel, Dovercourt.

Evans	£1,740	10	0
Smith, Beaumont & Dawson	1,579	0	0
Gunn	1,549	0	0
Brown	1,491	10	5
Saunders	1,421	16	8
J. MORAN & SON, Dovercourt (accepted)	1,300	0	0
Firmin	1,218	0	0

DUNEATH.

For Improvement of Harbour, Duneath, for the Caithness-shire County Council.

Reid & Tait	£1,852	7	6
Crossley, Tilburn & Co.	1,660	0	0

EGREMONT.

For Pair of Semi-detached Villas, Seabank Road, Egremont, for Mr. W. Rae. Mr. L. O. WILLIAMS, Architect, 70 Victoria Street, Liverpool.

W. Thornton & Son, Liverpool	£2,650	0	0
Raffle & Campbell, Liverpool	2,561	0	0
Bleakley & Co., Birkenhead	2,395	0	0
L. Desoer, Liverpool	2,325	0	0
Hough & Pilling, Liverpool	2,285	0	0
J. McGeoch, Seacombe	2,250	0	0
Laurie & Brimley, Liverpool	2,229	0	0
J. Bellis, Liscard	2,179	0	0

FALMOUTH.

For Supply of Hopper Barge for the Falmouth Urban Sanitary Authority. Mr. W. H. TRESIDDER, Borough Surveyor.

Burt & Son, Falmouth	£442	0	0
J. Wellington, Devorn, Truro	440	0	0
W. THOMAS, Falmouth (accepted)	430	0	0

FLEETWOOD.

For Construction of Jetty and Landing-place, Knot End, near Fleetwood, for the Fleetwood Improvement Commissioners. Mr. M. S. GAULTER, Surveyor.

W. Philp, Salford	£2,595	19	2
T. Riley, Fleetwood	2,460	0	5
J. Kirkbride, Fleetwood	2,300	0	0
T. Berry & Son, Rochdale	2,100	0	0
W. GRADWELL & CO., Barrow-in-Furness (provisionally accepted)	2,050	0	0
Surveyor's estimate	1,987	4	4

HALIFAX.

For Painting Conservatories and Greenhouses, Akroyd Park, Halifax. Mr. EDWARD R. S. ESCOTT, Engineer.

T. Rushton	£117	13	0
G. W. Longbottom	62	10	0
J. W. Hepworth	50	10	10
Murgatroyd Bros.	49	17	0
J. Hall	48	10	0
Drake & Kay, Hipperholme	45	14	2
Hinchcliffe & Hainsworth	44	0	0
W. Taylor	38	0	6
J. SPENCER & SON, Haley Hill (accepted)	34	17	6
J. Viney	33	15	0
J. M. Wilson	21	0	0

HAYWARDS HEATH.

For Pipe Sewers for the Haywards Heath Local Board. Mr. WILLIAM BEACH, Surveyor, Perry Mount Road, Haywards Heath.

Free & Son	£1,940	0	0
Lea & Sons, High Wycombe	1,863	12	0
J. Jackson, Plaistow	1,850	0	0
S. Kavanagh, Surbiton Hill	1,843	9	11
Box & Turner, Ardingly	1,771	0	0
Ossenton, Westerham	1,670	0	0
W. Steer, East Grinstead	1,489	0	0
W. H. Wheeler, London	1,470	0	0
W. MEARS, Eastbourne (accepted)	1,390	0	0
J. R. Hunt, Haywards Heath	1,362	0	0

For Roads and Sewers for the Haywards Heath Local Board. Mr. W. BEACH, Surveyor, Haywards Heath.

J. Jackson, Plaistow	£3,972	0	0
Box & Turner, Ardingly	3,862	0	0
J. Mayo, Haywards Heath	3,497	5	10
W. Coker, Rochester	3,386	0	0
J. R. Hunt, Haywards Heath	3,307	0	0
W. Steer, East Grinstead	3,287	0	0
Free & Son, Maidenhead	3,137	0	0
Fry Bros., Greenwich	3,089	0	0
W. H. Wheeler, London	3,078	0	0
W. MEARS, Eastbourne (accepted)	2,899	0	0
S. Kavanagh, Surbiton Hill	2,450	0	0
D. H. Porter, London	2,378	0	0

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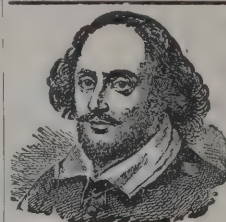
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PROOFS of this Illustration, which appeared in "The Architect" on June 6 1885 (now out of print), can be obtained on application to the Publisher, price Sixpence each, post free; on roller, Ninepence.

KEYMER.

For Works at the South District Schools, for the Clayton and Keymer School Board, Sussex.
 Miriam, Burgess Hill £990 0 0
 Dyke, Hassocks 895 0 0
 Saunders & Sons, Brighton 894 10 0
 Oram, Burgess Hill 839 0 0
 Lockyer, Brighton 835 0 0
 Allpey, Brighton 793 0 0
 Hollands, Hurst 797 0 0
 TAYLOR, Brighton (*accepted*) 720 0 0
 One tender was received from Hove, wanting name and address of sender.

LIVERSEDGE.

For Rebuilding Victoria Mills, Liversedge. Mr. ALFRED E. RHODES, Heckmondwike, Architect.
Accepted Tenders.
 G. Horsfall, Liversedge, mason.
 W. & T. Milnes, Heckmondwike, joiner.
 J. E. Greenwood, Heckmondwike, plasterer.
 Roberts & Co., Bradford, ironfounder.
 A. Jackson, Liversedge, plumber.
 J. W. Goodall, Littletown, Liversedge, painter.
 J. M. Thornton, Heckmondwike, slater.

LONDON.

For Painting, Distempering, &c., at Casual Wards, for the Guardians of Mile End Old Town. Mr. C. F. BURDEN, Surveyor.
 Eaton & Co. £226 0 0
 Robey 205 0 0
 Howell 162 0 0
 F. J. Wood 148 0 0
 C. Coles 140 0 0
 Vigor & Co. 139 0 0
 C. Coot 137 0 0
 Wall & Co. 125 0 0
 A. Derby 115 0 0
 Barker 110 0 0
 CROW (*accepted*) 109 0 0
 Barker & Oliver 98 0 0
 Judd & Son 97 0 0
 Stewart & Co. 91 12 9
 J. White 85 0 0
 Surveyor's estimate 120 0 0

LONDON—continued.

For Providing and Fitting-up Low-pressure Warming Apparatus in No. 5 Ward at the South-Eastern Hospital. Mr. T. W. ALDWINCKLE, Architect.
 Purcell & Nobbs, Cleveland Street £583 0 0
 Benham & Sons, Wigmore Street 550 0 0
 R. Crane, Clapham 520 0 0
 J. & F. May, High Holborn 474 0 0
 C. Gadbolt, Camberwell 473 0 0
 Clements, Jeakes & Co., Great Russell Street 456 10 0
 Comyn Ching & Co., Long Acre 449 17 6
 Strode & Co., Osnaburgh Street 437 0 0
 Murdoch & Cameron, Glasgow 410 0 0
 J. F. Clarke & Sons, Moorgate Street 395 0 0
 J. G. & J. S. Ellis, Charing Cross 385 0 0
 W. G. CANNON, Southwark (*accepted*) 335 0 0

For Alterations to 48 Lee Park, Blackheath, S.E., for Mr. E. Norfolk. Mr. J. COATES CARTER, Architect, Cardiff.

General Builders' Work and Decoration.

Turnbull & Son £920 0 0

Drainage, Water Supply and Gas.

Banner Sanitation Co., Charing Cross 357 10 0

Total £1,277 10 0

For Building Two Residences, Exeter Street, Chelsea, S.W. Mr. J. J. STEVENSON, Architect, London. Quantities by Mr. W. H. ELSMORE, Barnes, London.
 STEPHENS, BASTOW & CO., Limited, Bristol (*accepted*) £7,700 0 0

MOUNTAIN ASH.

For Construction of Road from Drainenwen to Aberdare Junction, for the Mountain Ash Local Board.

R. J. Mathias, Pontypridd £1,314 13 4
 Lloyd & Powell, Pontypridd 1,306 14 10
 T. Davies, Pontyclown 1,224 10 0
 J. H. Firbank, Newport 1,116 13 4
 D. Evans & Sons, Penygraig 1,106 10 0
 Barnes, Chaplin & Co., Treorky 1,040 7 6
 Williams Bros, Ynysybwl 992 18 9
 T. Taylor, Mountain Ash 974 1 8
 BATCHELOR & SNOWDEN, Cardiff (*accepted*) 957 16 10

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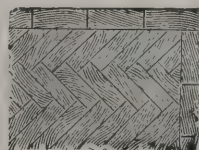
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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Water-testing Apparatus for detecting impurities in Water, 10s. 6d. and 12s. each.

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PETERBOROUGH.

For Alterations at Workhouse, for Peterborough. Mr. J. G. STALLEBRASS, Architect.	
W. Sibley	£37 15 0
J. Nichols	35 10 0
J. T. Machin	35 0 0
T. Bailey	34 19 0
J. GUTTRIDGE (accepted)	31 10 0

POOLE.

For Erection and Completion of a Cloakroom and Lobby at the Boys' National Schools, Perry Gardens, Poole, for the Committee of the Poole National Schools.	
T. J. Tilset	£96 14 0
J. Rigler	64 10 0
Burt & Vick	55 0 0
W. H. Gray	48 17 6
FOREMAN, CRABB & SHARP (accepted)	45 0 0

PONTYGWAITH.

For Building School at Pontygwaith, in Rhondda Fach Valley, for the Ystrad School Board.	
Edwards, Davies & Sons, Treherbert	£4,642 3 7

SLOUGH.

For a Block of Four Cottages on the Myrke Estate, Slough, for Mr. T. C. Moore. Messrs. NOTTAGE & SAMMONS, Architects, Slough and Windsor.	
J. Deverill, Slough	£1,200 0 0
G. Wernham, Reading	1,196 0 0
W. Ashfold, Slough	1,190 0 0
G. Hearn, Slough	1,150 0 0
C. Simmons, Slough	1,100 0 0
H. D. Bowyer, Slough	1,080 0 0
H. J. Grove, Windsor	1,063 0 0
N. Grove, Slough	1,058 0 0
A. A. Reavell, Windsor	1,038 0 0
J. Atkins, Slough	875 0 0
G. Bennett, Slough	873 0 0
R. BISHOP, Windsor (accepted)	860 0 0

SLOUGH—continued.

For New Road between Mackenzie Street and William Street, Slough, and Two Sewers therein, for the Trustees of the Estate of the late F. Charsley. Messrs. NOTTAGE & SAMMONS, Architects and Surveyors, Slough and Windsor.	
A. Jackaman, Slough	£950 0 0
H. Hill, Maidenhead	918 0 0
H. Morecraft, Acton	825 0 0
T. Kelly, Windsor	822 0 0
H. D. BOWYER, Slough (accepted)	820 0 0

For Erection of New Factory, Machinery Hall and Two Shops and Dwelling-houses, Slough, for Messrs. Elliman, Sons & Co. Messrs. NOTTAGE & SAMMONS, Architects, Slough and Windsor.

W. Watson, Ascot	£6,988 0 0
Patman & Fotheringham, Islington	6,951 0 0
A. Jackaman, Slough	6,900 0 0
T. Nye, Ealing	6,885 0 0
T. J. Messom, Twickenham	6,693 0 0
H. D. Bowyer, Slough	6,682 0 0
B. E. Nightingale, London	6,590 0 0
J. Deverill, Slough	6,500 0 0
C. F. Kearley, Uxbridge	6,383 0 0
G. S. Lewis, Reading	6,200 0 0
A. A. Reavell, Windsor	5,810 0 0
H. FLINT, High Wycombe (accepted)	5,687 0 0
Hollis & Son, Windsor (withdrawn)	5,639 0 0

SOUTHPORT.

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Brown, Lennox & Co., Cannon Street, E.C.	£27 15 0
B. French & Son, Liverpool	19 10 0
H. Wood & Co., Saltney	19 10 0
H. P. Parkes & Co., Liverpool	18 17 6
W. Bolton, Southport	17 19 0
Griffiths & Williams, Liverpool	17 5 0
T. Williams & Son, Halesowen, Birmingham	17 5 0
JUKES, COULSON, STOKES & Co., 13 Clement's Lane, E.C. (accepted)	16 5 0
E. Finch & Co., Sunderland, chain 15s. per cwt., shackles 28s.	

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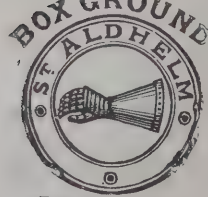
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J. L. Cattell, Stoke Newington	£6,387	0	0
G. Osenton, Westerham	6,193	0	0
MacAndrews & Co., Ludgate Hill	6,150	0	0
Girling & Co., Ipswich	6,090	0	0
B. Cooke & Co., Battersea	5,950	0	0
J. Neave, Forest Hill	5,880	0	0
S. Hipwell, Ipswich	5,673	10	0
B. H. Carter, Southwold	5,650	10	6
G. Bell, Tottenham	5,569	0	0
W. I. Chilvers, Wangford	5,495	11	6
J. Dickson, St. Albans	5,421	0	0
H. Weldon, Birmingham	5,400	0	0
G. Double, Ipswich	4,770	0	0

STAFFORD.

For Drainage Works, Stafford.

Enoch Tempest, Manchester	£20,326	0	0
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STOURBRIDGE.

For Construction of Earthenware and Iron Pipe Main Intercepting Sewers, Manholes and Appurtenances, in the Low-level Area of District, for the Upper Stour Valley Main Sewerage Board. Messrs. E. B. MARTEN, C.E., & W. FIDDIAN, F.S.I., Joint Engineers, Church Street Chambers, Stourbridge.

T. Philbrick, Leicester	£5,416	17	9
J. Biggs, Birmingham	5,132	0	0
Jones & Fitzmaurice, Birmingham	4,900	0	0
J. Mackay, Newport	4,512	5	3
G. Bell, Tottenham	4,501	0	0
Cruwys & Hobrough, Gloucester	4,069	6	11
H. Hill, Maidenhead	4,041	2	0
G. Law, Kidderminster	3,834	0	0
J. Guest & Sons, Brettel Lane	3,641	11	10
T. VALE, Kidderminster (accepted)	3,370	0	0

STRICHEN.

For Construction of Sewerage Works in the Village of Strichen, Aberdeen. Mr. JOHN D. WATSON, Engineer, County Buildings, Aberdeen.

Mackintosh & Connon, Peterhead	£751	17	2
D. Cruickshank, Cults	614	19	5
R. Anderson	556	16	3
A. Sim, Strichen	517	0	0
MCKAY, Aberdeen (accepted)	500	10	0

TRADE NOTES.

A DRINKING fountain, in polished red granite, a gift to the town of Elland by Mr. John Dewhirst, of Woodlands, has been erected in the recreation grounds. It is quatrefoil on plan, having four basins, with a continuous flow of water issuing from bronze lions' heads, with an imperial crown, also in bronze. The designer is Mr. Swinden Barber, architect, of Halifax, and the work has been executed by Messrs. Earp & Hobbs, of Lambeth and Manchester.

WE are pleased to state that Messrs. Cousland & Mackay have just supplied, according to the instructions of Mr. James J. Farrall, architect, of Dublin, one of their "Climax" Ventilating Co.'s Direct-acting Turret Ventilators, Design S, for the ventilation of the Empire Theatre, Belfast. This ventilator is of very large dimensions considering its ornamental character, being 5 feet 6 inches in diameter, with a 3-foot 4-inch diameter ventilating shaft, measuring over all 16 feet in height and 6 feet 6 inches in diameter, having finials surmounted with gilt copper ball and crescents, suitable for the architectural style of the building.

WE hear that Messrs. H. Parsons & Harris, of Sidney Grove, E.C., have been successful in securing the contract for the hot-water heating apparatus to be supplied and fixed in the extensive new offices at Messrs. Wallace & Co.'s show-rooms, Nos. 151, 152, 153, 154 and 155 Curtain Road, E.C.

THE Church schools, St. Annes-on-the-Sea, are being warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

TWO stained-glass windows and an elaborate memorial brass have just been erected in St. Augustine's Church, Highbury New Park, N., by some members of the congregation, to the memory of the late Rev. Gordon Calthrop, thirty

'SPHINX' PORTLAND CEMENT.



112 lbs. per bushel. Slow setting; test 1,000 lbs. to 1½ inch; seven days. Fineness, 2,500 meshes to square inch, with less than 10 per cent. residue. Over 10,000 tons supplied to Cardiff and Hereford Water Works.

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years vicar of the parish. The works have been carried out by the well-known firm of Alexander Gibbs & Co., of 21 Bloomsbury Street, W.C., by whom the large east window was executed some few years ago.

WE are informed that in sending us particulars of London tenders last week an omission was made in respect to the alterations, in which the name of the road was left out. It should be Nos. 593, 595 and 597 Old Kent Road.

THE Watford School Board have accepted the tender of Mr. Brightman for new schools, Leavesdon Road, at 4,095/.

LAST week we gave a description of the alterations made at Barnard's Inn, Holborn, to fit it for the purposes of schools for the Mercers' Company. We have pleasure in stating that the excellent fittings of the class and lecture-rooms have been supplied by Messrs. Geo. M. Hammer & Co., Strand, London.

VARIETIES.

THE Lybster waterworks, the first constructed by the Caithness County Council, have been formally opened by Mr. Miller, of Scrabster, convener of the county. The cost is about 1,000/.

It is stated that Mr. John Thomson Paton, of Norwood, has agreed to erect and equip a complete set of baths for Alloa, together with a gymnasium and furnished rooms for conversation and amusement, together with 3,000/ as an endowment.

THE Atherstone Board of Guardians have applied for powers to borrow 11,412/ for water supply purposes.

THE Stafford Town Council propose to borrow 42,000/ for carrying out works of drainage.

THE Torquay Town Council propose to expend 22,000/ for works in extension of harbour accommodation and the construction of a new promenade pier.

THE Leicester water committee have resolved to reduce their water supply to the public, the reason alleged being the absence of rain. No complaints on this score have been recorded from any other parts of the kingdom.

THE committee of the Leeds Corporation lately visited Kirkstall Abbey in company with Mr. Micklethwaite, architect, under whose supervision the works for the preservation of the ruins are being carried out. The committee inspected the large tower, which is about to be repointed, and Mr. Micklethwaite

was instructed to prepare plans for a new lodge and entrance gates. Up to the present time 5,500/ has been expended on works in connection with the Abbey and recreation ground, but that sum includes more than 1,000/ for adjoining land which was added to the recreation ground.

WE regret to announce the death of Mr. Robert Grierson, architect, Bangor, at the early age of thirty-five years. He was born in Dumfriesshire, educated at Dumfries Academy, and was a fellow-scholar of Mr. J. M. Barrie, author of "A Window in Thrums," and Mr. Jas. Thompson, the African explorer. He served his apprenticeship with a well-known firm of architects, and went to Bangor as assistant to Mr. Richard Davies, architect. Shortly afterwards he started in practice for himself, and was rapidly coming to the front in his profession. During his career he undertook several works of importance in Anglesey and Carnarvonshire. He was one of the four who obtained premiums at the last Bangor National Eisteddfod for designs of the proposed intermediate schools for Bangor, and had only just completed plans for the new schools about to be erected for the Llanrwst School Board.

THE fears of the people of Leighton Buzzard as to the threatened sale of their ancient market cross have, it is stated, for a time at least been set at rest. The cross was one of a number of lots to be offered in connection with the proposed sale by auction of the Stockgrove estate, but the properties failed to realise the reserve price and all the lots were withdrawn.

A DISASTROUS fire has occurred at the Kingsteignton Potteries Brick and Tile Works, situated about a mile from Newton Abbot. The damage done, which is covered by insurance, amounts to about 40,000/ or 50,000/. The works, which were commenced about five years ago, were owned by Messrs. Hexter, Humpherson & Co.

A RESERVOIR belonging to the Castleford Local Board has collapsed, situate at the top of Red Hill. The whole of the water, estimated at between 15,000 and 20,000 tons, mysteriously disappeared, and it was found that a "crack" at the bottom of the reservoir was the cause. The water had evidently found its way into the old workings of the sand-holes or pits which abound immediately under the site of the reservoir.

A WEALTHY American iron and steel master now in this country has announced that he and several friends are so satisfied of the prospects of tinplate-making in America that they are forming a private company to commence tinplate manufacture on a scale which will immensely increase the

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present American output. A firm at Pittsburg who have been in close contact with the iron trade have also decided to invest 50,000*l.* in a tinplate works.

AT the meeting of the Stamford Town Council in committee a report on the drainage and water supply was submitted by Mr. R. H. Bicknell, engineer. He reported that the cost of excavation would be somewhat high, owing to the drains having to be laid for the most part in rock. A system of ventilation by means of manholes or lampholes is provided, and Mr. Bicknell proposes to construct five large arteries or storm-water mains, which will take in the whole of the storm-water, utilising as far as possible the existing drains for that purpose. He recommends the adoption of the "International" system of purification at the outfall works. With regard to the water-supply, Mr. Bicknell says there is abundance of water in the neighbourhood, which however is at present only partially used, and he estimates the cost of carrying out the drainage scheme at 30,000*l.*

BUILDING AND BUILDERS.

THE Local Government Board have authorised the erection of a hospital at Shooter's Hill by the Metropolitan Asylums Board at a cost not exceeding 200,000*l.*, and have sanctioned the borrowing of the money. A consultation is to be held concerning the proposal to build an imbecile infirmary on the Tooting Lodge Estate.

A PUBLIC meeting of the London County Council Employés' Labour Union took place in Battersea Park. The Secretary said it was claimed that the Council, by doing their own work in certain cases, saved the ratepayers' money. He believed that if a truthful account of the expenditure on some of these much-vaunted jobs was forthcoming it would be seen that the total cost was in excess of what an ordinary contractor would have charged. In the case of the York Road sewers various items of expenditure were left out of the accounts, such as the salaries of the heads of departments or the surveyors. Then there was little doubt that the work was not done so well as it would be by a contractor. The Secretary's revelation will not be a surprise to practical men.

THE premises occupied by the Institution of Civil Engineers in Great George Street, Westminster, are in process of demolition prior to being reconstructed. The premises on either

side will be added to the institute, and the theatre of the building, in which the meetings and discussions have been held in the past, will be renovated so as to harmonise with the new structure. The work is to be carried out by Messrs. John Mowlem & Co, builders, from designs of Mr. Charles Barry, architect, the estimated cost being about 40,000*l.*

The Glasgow Dean of Guild Court have granted the University Court authority to erect a two-storey building in Queen Margaret Crescent, Kelvinside, to be used as dissecting rooms and lecture hall for the medical classes at Queen Margaret College. The extension is estimated to cost 5,000*l.*

ELECTRICAL.

THE sub-committee of the Edinburgh Town Council on electric lighting have recommended to the Lord Provost's committee that a deputation of three members should go to London to select a lamp for public lighting in Edinburgh, several specimens having been fitted up at Westminster by the Corporation's consulting engineer.

THE Mersey Dock Board have decided to provide electric lighting installations at the new coaling jetty, Duke Street Bridge, East Float, Birkenhead, and at the Albert Dock warehouses.

AT the meeting of the Chester Town Council the following recommendation of the electric lighting committee was adopted:—"That the Water Tower Gardens, belonging to the Corporation, be the site for the proposed electric light generating station, and that the committee be authorised to proceed to establish the installation, submitting tenders, or terms of any proposed contract, to the council in the usual way."

AT the meeting of the watching and lighting and gas and electric committees of the Town Council, it was reported that the cost of the electric lighting of Union Street, at 7*d.* per unit, was 262*l.* 2*s.* 10*d.* per annum. The expenditure for gaslight over the same area was stated to be 70*l.* 5*s.* 10*d.* It was decided that the gas department should supply the current for street lighting at 2½*d.* per lamp per hour, the lighting committee to bear the cost of the carbon and maintenance.

AT a general meeting of the Bath Electric Lighting and Engineering Company, Limited, the following resolution was passed:—"That the City of Bath Electric Lighting and Engineering Company, Limited, apply during the present year to

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the Board of Trade for a provisional order authorising the supply of electricity by the said company for all or any public and private purposes within the area of the city of Bath."

At the meeting of the Worcester watch committee, a letter was received from Mr. C. W. Dyson Perrins asking whether the committee could entertain the idea of supplying his premises at the top of Malvern Link with the electric light. He said he should require from 200 to 300 lamps, as well as one or two motors. A letter was also read from Alderman Day calling attention to the electric-light standards fixed in the city, which were an enormous obstruction. He suggested hanging-lamps or lights from brackets. He also complained of the transformers being fixed in the most objectionable places in the pavement, and unless very great care was exercised in protecting openings when the covers were off accidents would occur. The matter was referred to the sub-committee.

THE SHEFFIELD AND LONDON RAILWAY.

THE contracts for the new railway from London to Sheffield have now been let, with the exception of that part comprised within the Metropolis, where the works are particularly heavy, but this last one will be let next week, so that the work may be started at all points simultaneously. There are in all seven contracts, including the London one, which extends for only $4\frac{1}{2}$ miles from Marylebone through Lord's Ground, but it is all in cut and cover or in tunnel, and includes terminal station and hotel, the cost being put at about 550,000*l.* per mile. From Lord's the trains will run over the existing line of the Metropolitan Company to Quainton Road, 21 miles north of London. From this point the line runs generally straight north to Sheffield, only curving two or three times to cut through Rugby a little to the east, Lutterworth, Leicester, Loughborough and Nottingham. The first 25 miles of the line are let to a London contractor, Mr. J. T. Firbank, who thus has two contracts. The next 15 miles to Rugby have been undertaken by Mr. Thomas Oliver, Totley, near Sheffield. This length includes a tunnel, $1\frac{1}{2}$ miles long, at Catesby, which is perhaps the most difficult part of the work. There is also a heavy bridge over the London and North-Western Railway near Rugby. For 20 miles north of Rugby the line will be constructed by another London firm, Messrs. Topham, Jones & Railston, and this includes the work of tunnelling through Nottingham.

From East Leek to near Nottingham, the next 15 miles, the work will be done by Mr. Lovatt, Wolverhampton, and for the remaining length to Annesley, on the line to Sheffield, a Sheffield firm has the contract—Messrs. Logan. It is understood the contract prices come well within the Parliamentary estimate, which was 6,500,000*l.* for the whole works on the 112 miles of railway.

CLINKER PAVEMENTS.

In Edinburgh about fifteen tons of "clinker" are turned out daily in connection with the refuse-destroyer at Powderhall, and the question of its disposal, in respect of the enormous accumulation, has been exercising the minds of the authorities. Recently, says the *Scotsman*, the idea occurred to Councillor Sloan that the "clinker," which can be ground on the premises, might be utilised in forming the upper layers of pavement on the lines of the granolithic industry. That portion of the north side of London Road extending from one end of Hillside Gardens to the other was selected for the experiment, and there the work is now in progress in the hands of Messrs. John Baird & Son. Previously the pavement there was "hornised," and the stones have been used as the foundation for the mixture of "clinker" and cement. Naturally the "clinker" is of a darkish colour, but it is rendered somewhat lighter in tone through the use of chemicals; while by the aid of hematite the layers are alternately what may be described as blue and red. The layers are from 2 inches to $2\frac{1}{2}$ inches in depth. A portion of the work has been already completed. A few days ago it was inspected by Bailie Dunlop, convener of the streets and buildings committee, Bailie M'Donald and Councillor Sloan; and so far as it has gone, these gentlemen expressed themselves as highly satisfied with the experiment. Should this process of street paving prove in the end to be substantial, the chances are that, as already indicated, a considerable saving will be effected, because while granite chips cost from 14*s.* to 15*s.* a ton, "clinker" can be supplied at about 1*s.* per ton. Meanwhile, however, what is considered of most importance is the disposal of "clinker," and there can be no doubt that the experiment will be watched with not a little interest. Judging from present appearances the new process is likely to compare favourably with the old. The substance is strong and firm, and the blending of colour in the alternate layers gives the pavement quite an attractive look.

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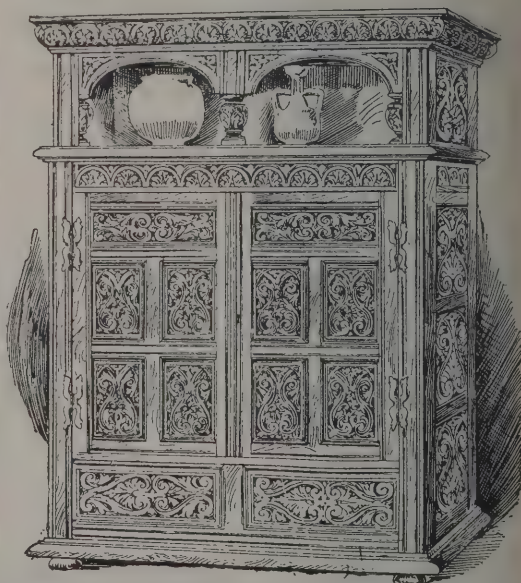
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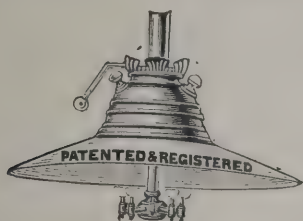
NEW PREMISES, OLD SQUARE, BIRMINGHAM.

A STREET HOUSE.

WETTON CHURCH.

NOTES ON NOVELTIES.

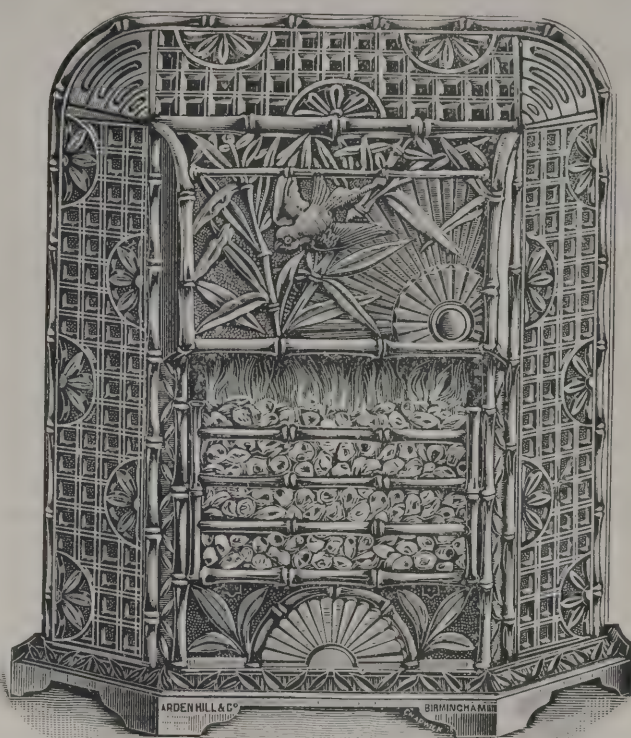
THE engraving shows a new carbon gas lamp just introduced by Messrs. Joseph Ratcliff & Sons, of New Summer Street, Birmingham, designed on the model of their new Rapid lamp, which has been received with so much favour by the public. One principal feature has been the production in very improved character at a much lower cost of an underlight carbon lamp. It is excellently finished in chocolate enamel, or is nickel-plated to suit the purchaser's taste at the same price.



It also is fitted with a regulator which prevents any chance of smoking. It throws no shadow whatever owing to the lights being some distance below the container. An objectionable feature in some carbons was the fact of the nickel burning off. This is overcome in the new Rapid by its having a strong opal glass reflector which keeps off the heat from plated parts. An inspection of the actual article will not fail to convince a customer of its merits.

THE accompanying engraving illustrates one of the prettiest stoves just lately put on the market. The design has been

arranged with a view to its being in harmony with its surroundings, and also more particularly to suit the prevailing taste at present for artistic bamboo furniture. For this, the latest idea in



gas-stoves, the public are indebted to the enterprise of Messrs. Arden, Hill & Co, gas engineers, Lichfield Road, Birmingham. It is brought forward at a seasonable time, when householders are preparing for winter requirements. It combines all the latest improvements, and it cannot fail, we think, to give great satisfaction in every way, not only from an artistic point of view, but from fulfilling the functions of a reliable warming apparatus.

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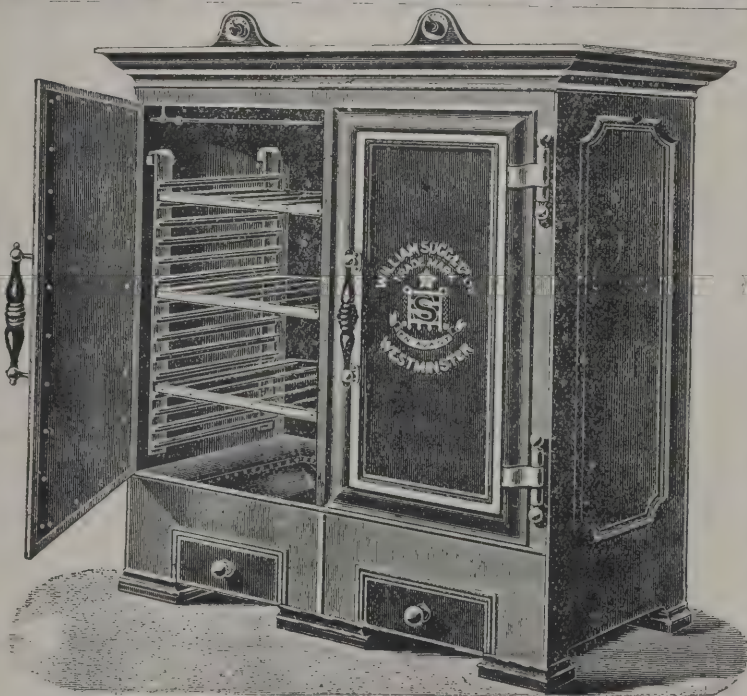
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THE KENSINGTON WHEEL.

THE great wheel at West Kensington is progressing, and will no doubt sooner or later be completed. The summer, however, has been very unfavourable for rapid work in an undertaking of this nature, and it is pretty evident that there will not be much spinning round this summer. All the real difficulties of the task, says the *Daily News*, have been successfully overcome, and what remains is tolerably easy and straightforward. The ponderous axle, 40 feet long and 53 tons in weight, has been successfully hoisted to its position on the top of the iron supports that stand 150 feet high. This was a very anxious piece of business, but it was accomplished without mishap of any kind; indeed, it is a fact very creditable to the young resident engineer, Mr. C. F. Hitchins, that no accident has happened in connection with this wheel from the outset. It was hoped a month or two ago that, the axle once in position, the building of the rest of the wheel might be carried on with such rapidity that it might have been got to work before the end of the holiday season. That is clearly out of the question, and the fact that the experiment of setting up the electric light and carrying on the work by night as well as by day has been abandoned shows that there is no longer any expectation of being ready for the public this summer. The overtime working was found to be extremely expensive and very unsatisfactory in result, and, moreover, there was all the while considerably greater liability to serious accident. The construction of the spokes and rim of the wheel is now in progress. Of thirty-nine sections two are now finished, and the advance is at the rate of almost one a week. Things may go faster when the greater cycle has been further developed, but it is hardly probable that anything can be ready for the public at all events before the spring of next year. It is stated that Messrs. Brown, Marshall & Co., of Birmingham, have completed all the carriages to be suspended from the wheel, and one complete specimen, a handsome and elaborately decorated saloon capable of holding forty people is now on the ground. Although the carrying out of this unique undertaking is very considerably in arrear of what had been expected, its progress has really been very rapid. It was begun only last March, and its completion by next March will be a very smart feat of engineering, whatever the West Kensingtonians may think of it as a sort of revolving sky-sign set up in their midst. It would no doubt have been more satisfactory to see the same amount of capital and engineering skill devoted to a more useful purpose, but so long as there are

boys and girls to be amused, and sweethearts to be treated, and country cousins to be astonished, and Yankees to be "licked," no doubt these things are, in a certain restricted sense, necessities of life.

REGISTRATION OF PLUMBERS.

THE fifth annual congress of the district councils of Scotland in connection with the national registration of plumbers opened in the Town Hall, Inverness, on Tuesday. Provost Ross presided, and was supported by Sir Stuart Knill, ex-mayor of London and master of the Worshipful Company of Plumbers; Professor Glaister, Glasgow; Professor Matthew Hay, Aberdeen; Professor Macadam, Edinburgh, and others. Provost Ross, in welcoming the delegates, expressed special gratification at the presence of Sir Stuart Knill, and said the congress could not fail to do much to forward sanitation in the North. Sir Stuart Knill acknowledged the welcome, and said that he had always felt a deep interest in the matter of sanitation, especially in regard to plumbers. He was there as Master of his Company, by desire of his Fellows in the governing body, to pay respect to the plumbers of Scotland. The object of his visit also was to ascertain for the benefit of his company what were the wishes and proposals of the plumbers of Scotland. What the plumber desired, he presumed, was to make his trade respected as it ought to be and as it once was; he wanted to get rid of those men who did dishonour to the trade, men who started as plumbers and sanitary engineers without knowing one particle about the science of the trade. On the motion of Mr. Gordon, Glasgow, seconded by Councillor King, Glasgow, the model regulations and by-laws for the drainage and plumbing work of buildings were approved. Sir Stuart Knill considered that if the registration movement, which had been set on foot in London, resulted in nothing else than the adoption of similar regulations, they would be able to congratulate themselves upon having achieved a great work.

THE NEW METROPOLITAN BUILDING ACT.

SOME of the anticipated effects of the new Act are explained as follows by Mr. W. Wallace Bruce, a member of the London County Council:—Up to the present time, so far as central London is concerned, the Acts in force regulating the building of dwelling-houses have left the builder practically free to put

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NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 1, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

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up what dwellings he pleases, utterly regardless of any considerations as to whether the rooms in these houses will have sufficient light and air to make healthy human life possible. This absence of adequate restrictions has resulted in the frequent erection of dwelling-houses which are a disgrace to any community boasting of sanitary knowledge. I will give a few examples of what has recently been perpetrated. In one case a block of buildings of five storeys has been erected and two or three families are living on each floor, yet at a distance of only 6 feet behind this block stands a warehouse 50 feet high, which excludes the light and air from all the back rooms of the dwelling-house, and the children growing up in them are like plants in a cellar. In another case only 3 feet of space has been left behind a block of recently-erected dwellings, and the owner of the adjoining land has it in his power to replace the old cottages which are now standing there with lofty warehouses or block dwellings and so entirely exclude all light and air from the buildings in question. These are only two typical cases of what is going on over a large portion of London; many rooms have to be lighted by gas at noon on a bright sunny day. For the future the building of such dwelling-houses will be rendered impossible by an Act of Parliament promoted by the London County Council, which has just become law. This Act provides that the space in rear of all dwelling-houses to be built for the working classes shall be in proportion to the height of the house, and fixes the minimum size of the courtyard at the back of the house at 150 square feet, and the depth from front to rear of such court at not less than 10 feet. It may be asked why so wholesome a provision is limited to the working classes so far as central London is concerned.

The answer is that in the committee of the House of Commons to which this Bill was referred, the opposition to a whole roomfull of counsel engaged to oppose this Bill was so severe that it was only possible to secure this provision by limiting it to those cases where the evils resulting from the present law are most apparent. Another part of this Act will remedy a glaring inconsistency in the present law. There are parts of London covered with long, narrow alleys, 9 feet to 12 feet wide, in which the old two-storey houses are being condemned as unfit for human habitation. The Building Act in force up to the present time allows these houses to be rebuilt up to the height of 90 feet without requiring the alleys to be widened. It is true the rookeries thus constructed could be condemned under the Housing Act of 1890, but full compensation would

have to be paid by the ratepayers of London to the owner who had perpetrated this iniquity under the sanction of the law. How great is the cost of such compensation is shown by the result of the Boundary Street clearance in Bethnal Green. In this case an area of 15 acres of narrow alleys and courts of old buildings was cleared by the Council under the Housing Act of 1890 and the net cost, after taking the value of the cleared land as an asset, has been about 280,000/. The Act just passed remedies this evil by providing that in streets of less than 40 feet wide, only houses of a height not exceeding the width of the street or alley shall be built for the working classes.

These two provisions, taken together, will remove one of the greatest obstacles to the putting in force of the Housing Act of 1890 and part of the Public Health Act of 1891. So long as it was possible to rebuild houses condemned under these Acts to such a height that they were even more unhealthy than before, there was a reason for the local authorities hesitating to put these Acts in force. In future that very good reason can no longer influence them.

There yet remains the grave question, What is to be done with the excess of population in those districts which are so overcrowded that it is impossible to rehouse on the spot under healthy conditions all the people who are now living there? The only solution appears to be the supply of some cheap means of conveyance to and from less crowded districts, where the lower rents will enable them to pay the cost of transit to their work; whether this can best be done by electric railways is a question well worth the attention of engineers.

The community are not aware of the loss annually suffered from the present state of the dwellings of the working classes in central London. Thousands of children are growing up with deficient vitality, and will become a charge on the public in hospitals, asylums and workhouses, and will go to form that most hopeless section of the unemployed—those who, though willing to work, are unable through want of vitality to do a good day's work in return for fair wages.

At the meeting of the Mersey Dock Board the suggestion of the works committee was agreed to, to erect a wooden fence, &c, between Canada Street and the yard occupied by Messrs. Farnworth & Jardine, to the north of the North Carriers' Dock, at an estimated cost of 455/.

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THE BETTERMENT QUESTION.

(Concluded from last week.)

THE following is the report prepared by Mr. Clare, the deputy town clerk of Liverpool:—

Betterment.

At the commencement of their inquiry into this subject, the committee have been met by the difficulty of ascertaining exactly what is meant by the term "betterment."

As far as can be gathered from the speeches and evidence of those who advocate "betterment," the general principle seems to be that where a street improvement is carried out at the public expense, which has the effect of increasing the value of any particular property, a portion of that increased value shall be taken by the public from the owners of the property. But, when the Bills which have been introduced in Parliament to carry out the principle are examined in detail, it will be seen that "betterment," in its proposed application, is a very different thing from the general description of it.

The committee propose, in the first place, to examine into the merits of the principle itself; then to show the nature and effect of the provisions in the Bills dealing with the subject; and, lastly, to explain their own views and recommendations as to altering the law, so as to enable the public to obtain a share in the unearned increment in land.

The principle of "betterment," as generally proposed to be applied, has hitherto been confined to placing a special tax on land actually increased in value by street improvements which may be carried out in future; but it seems to be assumed that the increased value will only be given to land immediately in the neighbourhood of each street improvement, and that, therefore, the application of the special tax is to be limited to some defined area adjoining the works to be carried out. It further appears to be assumed that a street improvement does necessarily increase the value of land in the neighbourhood, and that, therefore, some substantial benefit will accrue to the public from the imposition of the special tax.

On these points the committee have the following observations to make:—

Assuming it is possible to specify the increased value accruing to land as a direct consequence of some particular expenditure out of public funds, there seems no logical or sound reason for selecting the increment arising from that par-

ticular expenditure as a subject for special taxation, while the increment arising from all other expenditure is left exempt from special taxation.

Therefore, if the principle of levying a special charge on land for exceptional benefits accruing to it is adopted (which "betterment" involves), it is giving the public but a small portion of what they are entitled to if they are only to levy the special taxation on the increment arising from street improvements.

Next, in the case of property which increases in value after a street widening has been carried out, how can it be ascertained whether that increase is owing to the carrying out of the widening or to the development in the trade and population of the town, which, in itself, creates a demand for land and consequently adds to its value? For instance, supposing the demand for trade premises and offices in some particular district of a town is rapidly increasing and rentals in that district are generally rising, and that, during the period of this rise in land values the corporation decides to widen one of the streets in that district. Suppose, also, that the increase in values continues during, say, the four or five years which will elapse before the widening is completed, can it be fairly said that the increase in values between the date when the corporation deposits their plans for the improvement, and a date, say, two years after the works are completed, is owing to the expenditure incurred on the street widening? And if not, how is the increase to be apportioned? But betterment requires it to be done.

If land is increased in value owing to the energy and enterprise with which the ratepayers in a town carry on their trade or business, and to the general good government and judicious expenditure of public funds by the corporation, the ratepayers should be just as much entitled to a share in the increment arising from those causes as if the increase in value happened to follow some particular expenditure on a street improvement carried out in order to give greater facilities for traffic, and to enable the trade and business of the town to be more advantageously conducted.

There does not appear to the committee to be any logical reason for limiting the right of the ratepayers to share in the increase arising from one particular class of expenditure only, even assuming that increase is capable of being ascertained.

Then as to the limitation of the area for imposing the tax.

In the Metropolis the demand for land is such, particularly in certain districts, that whenever a new street is cut through a

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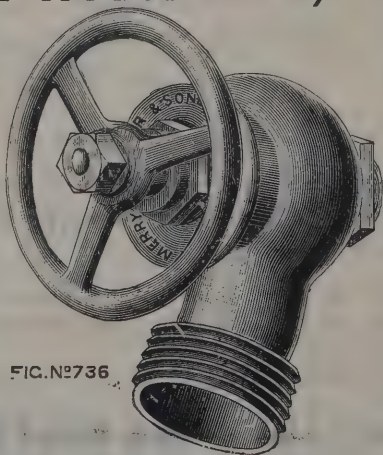
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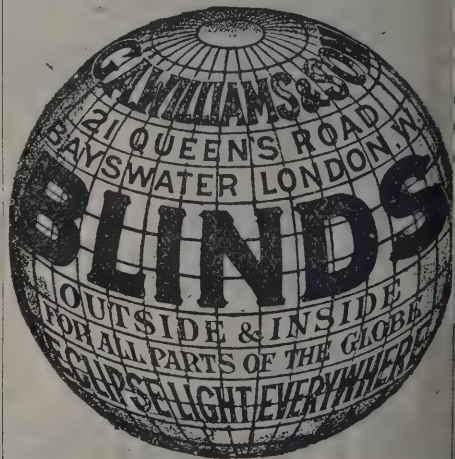
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built-up district, or a street is widened, the frontages at once command a market value probably greatly in excess of the value of the land previous to the improvement, but, more probably than not, other property a distance away will also be much increased in value, owing to the effect that the improved facilities for traffic may have upon it, or possibly owing to the displacement of trades and population caused by the improvement itself, and which have to find location elsewhere.

It seems contrary to the true principles of taxation in such a case to impose a special tax on the one property and exempt the other.

But the Metropolis must not be taken as the criterion for gauging the effect of "betterment" in provincial towns.

The experience of the members of the committee in their own towns is that, as a general rule, a street improvement, which involves the acquisition and pulling down of a large number of business premises or dwelling-houses, so dislocates the trade on the line of street, either by the compulsory removal of trades, or by depopulating the district, and so taking away the customers from the shops in the neighbourhood, that it takes many years for the property fronting the street to develop or for the property adjoining to recover.

The slow development of frontages to a new or widened street has been, as a rule, the painful experience of corporations where they have purchased sufficient land so as to have the frontages to the new street to sell themselves, which has proved that "recoupment" is a mistake financially.

Of course, if a new street is made which opens up a new district for building purposes, the land in the immediate neighbourhood is naturally increased in value; and if it happens that, at a time when there is a considerable increase in the trade of a town, a street widening is carried out in a district suitable for trade purposes, then (if "betterment" does not stand in the way) the frontages of the widened street would probably be quickly developed by the owners, or sold to builders at enhanced prices. But, speaking generally, experience in provincial towns shows that street widenings do not for some years improve property in their immediate neighbourhood so much as property in other parts of the town, and that it often takes many years before the frontages to a new or widened street become fully developed.

Moreover, the "betterment" principle is only proposed to be applied in cases where corporations obtain powers to carry out street improvements in future, and therefore no advantage will be gained by the public in respect of capital already spent,

and which in some towns has, perhaps, amounted to so large a sum as to practically prohibit further expenditure for some years to come.

It is now proposed to consider the provisions of the London County Council Bill and the Manchester Corporation Bill of this session relating to "betterment."

The provisions of both Bills are practically identical, except with regard to the terms for redeeming the proposed tax.

The preamble to the clauses recites that the street improvements "will or may substantially and permanently increase in value lands in the neighbourhood of the above-mentioned street improvements which will not be acquired for the purpose thereof, and it is reasonable that provision should be made under which, in respect or in consideration of such increased value, a charge should be placed on such lands;" and then the first clause goes on to provide that the corporation, on the deposited plans for the improvement, shall show the limits of the land which will or may be so increased in value. No land outside the limited area is to be charged, no matter how much it may be increased in value.

It often takes several years to acquire all the land for a street improvement and complete the works, unless all the lessees and tenants are compensated at great cost, and during that period many changes may take place in the course of the trade and circumstances of a town, and it is highly probable that the area shown on the plan will contain property very much depreciated by the works, and will exclude property most benefited.

It is mere guess-work to attempt, several years before an improvement is carried out, to fix the area of property that will be improved.

The charge to be imposed on the land within the limits is then to be assessed by the Corporation "as soon as conveniently may be (but not later than seven years) after the passing of this Act." Assuming that the works are completed within seven years from the passing of the Act (which is by no means certain, particularly as no limit of time for completion is fixed), and assuming that the particular improvement is one most likely to immediately encourage new building schemes, is it not probable that within the year or two that may remain of the seven after the street is completed the owners of land within the betterment area will refrain from developing their property, and builders from buying the land, if they know that any sign of developing the land will be used as an argument for increasing the betterment tax? Consequently the question

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as to what figure is to be taken to represent the increase in value to the land caused by the improvement will then be a matter of estimate by the Corporation, subject to appeal to an arbitrator. But the probability is that in the majority of cases in provincial towns there will be no exceptional demand for property within the betterment area during the first few years after the improvement is completed, and no desire on the part of owners to rebuild.

In cases where only one side of a street is pulled down, the improvement (if any) to the property on the other side will probably only arise to a small extent during the period of seven years, by enabling owners to get better rents for the buildings as they exist, and the buildings will generally have to be pulled down and rebuilt before the full increase in value to the land can be ascertained.

As the betterment charge, when imposed, will be a permanent taxation (subject to redemption), and will continue even if the shifting of trade from the neighbourhood at a later date may cause the property to depreciate below its value before the improvement was carried out, an arbitrator is not likely to be hard upon the owners by imposing a substantial tax upon their land for a hypothetical benefit which after all may be never realised, or be only temporary, and the result will probably be that after a great deal of trouble and expense the "betterment" charge over the whole area will not give any really substantial relief to the rates. In any case it will be a speculation between each owner and the public, by which either the owner will have his property taxed unfairly and unequally, as compared with the property of other owners, or the public will not get the amount they are entitled to.

It seems to the committee to be objectionable in principle that taxation should be based on an estimate of benefit which may arise in future, and not be limited to some benefit which has arisen and is present at the time the taxation is imposed; and, moreover, local taxation, to be equitable, should fluctuate with the value of the property to be taxed, and not be permanently fixed on what may be the estimated value of the property in some particular year. If every owner of property situate within the betterment area were obliged to sell his property within a given time after the works were completed, then, if it could be clearly shown that each owner had made a profit of, say, 1,000% by reason of the improvement, a portion of that sum might be fairly taken by the public; but the majority of owners will not sell, and then their profit is represented by the increased annual value of the land and not by a

capital sum. If then in the course of a few years the increased annual value at first accruing become reduced, it seems unfair to impose on the land a permanent tax based on an annual value that has only been maintained for a few years. Conversely, if the annual value further increases, the property should bear a higher tax proportionately.

As before pointed out, the fear of increasing the permanent tax on the land will prevent the early development of the property within the limited area which otherwise might take place; the assessments will therefore not increase, and the public will lose the rates which the property would bear if it were at once developed.

Putting aside the objections pointed out to "betterment" as proposed to be applied, it seems to the committee that in provincial towns the application of the principle would practically be of very little advantage to the ratepayers (save in exceptional cases), and no town will gain the slightest benefit from it until it has at some future date obtained an Act of Parliament to carry out a street improvement and has completed the works.

It is unnecessary to point out to members of the Association the increasing difficulty there will be to get the promotion of a Bill including "betterment" through a ratepayers' meeting and subsequently through Parliament if a powerful owners' association is formed in each town to protect their interests.

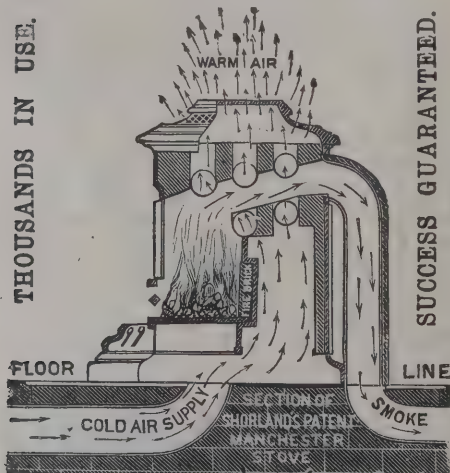
What the public want is some means of acquiring property at fair and reasonable prices for all public purposes without having to pay the exorbitant compensations for loss of prospective value which owners now get, and thus save in the original outlay, instead of trying to get back a portion of a larger outlay in the shape of "betterment."

With regard to the question of acquiring land for public works at fair prices, it is not proposed that an owner should be prevented from claiming all the compensation he is now entitled to claim under the Lands Clauses Act, but the committee recommend that the Act should be amended so as to enable the local authority, where an owner whose land is being acquired claims compensation for the prospective increase in the value of the land, to contend, by way of set-off to the owner's claim, that there will be a prospective increase in value accruing to property adjoining and remaining in the possession of the owner, and that the effect of the works for which the land is being acquired may be taken into consideration.

In conjunction with this the Act should be further amended to enable local authorities in all cases, if they think fit, to acquire only so much of any property as is actually required

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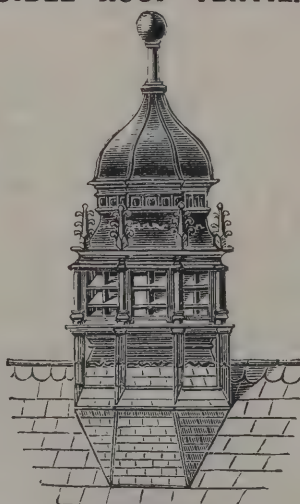
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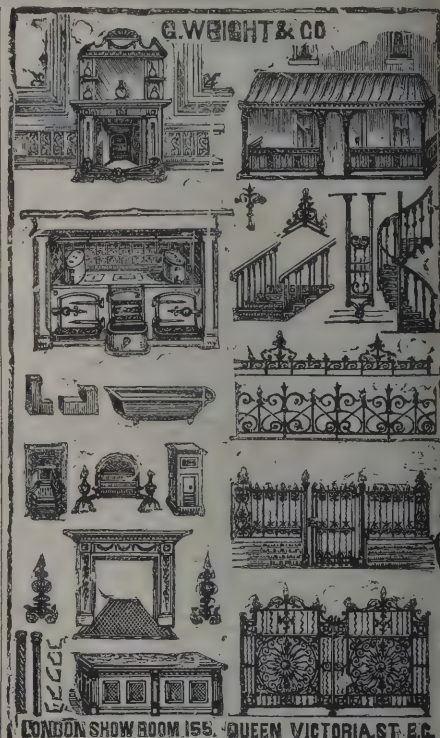
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for the works, on paying such compensation for severance as the owner would be entitled to get after the alteration in the law before suggested has been made.

Provision might also be made that the sum payable for compulsory purchase (over and above the price) should be limited to 5 per cent. on the price, instead of the customary 10 per cent., and that the liability to pay the costs of the inquiry to settle disputed compensation should be in the discretion of the jury, arbitrator or umpire, as the case may be.

If these amendments in the law are made, there would be a considerable saving to local authorities in the compensation to be paid for land required for all public works.

On the general question of the more equitable adjustment of local rates as between different properties within any given rating area, the committee recommend the following principle for adoption on which to found legislation, viz. :—

That the ratepayers have a right to appropriate for public use a portion of the increment in land as and when that increment arises, quite irrespective of the cause which produces it.

The application of this principle involves two main considerations :—First, the method for ascertaining the increment ; and secondly, fixing the proportion which the public ought fairly to appropriate.

With regard to the first point, the present law, by which rates are levied on the annual value of property, to a large extent provides an equitable method, but owing to the method of ascertaining the annual value many properties escape the burden of a fair share of the rates.

It is impossible to adjust local taxation with absolute equality, so that every ratepayer shall pay in exact proportion to the benefit he derives from the expenditure out of the rates.

"Betterment" theoretically is an attempt to carry out such an adjustment as regards a certain class of expenditure, but in its proposed application it will leave the incidence of local taxation as unequal, if not more so, than it is at present. Moreover, if the principle is adopted of imposing special charges on certain property in respect of the benefit which that property receives from the expenditure of money for the good of the inhabitants of the whole area, over and above the proportion of the benefit received by other property in the rating area, then the same principle should also be applied to all kinds of expenditure, and not be limited to one special class.

The increased value given to some properties in a town by new waterworks or main drainage works or improved paving is, in proportion, far in excess of the benefit derived by other

properties, but it would be impossible to pick out all the properties which specially benefit by each class of expenditure and impose a special charge on them which would equitably adjust the contribution to the expenditure on those works.

Why, then, should certain property which is increased in value by a street improvement be charged with an extra rate for the benefit of all other property within the rating area, when no extra rate is charged on other property specially increased in value by expenditure on other purposes, and which if charged would go in relief of the property, subject to the extra rate for the street improvement? That is not an equitable adjustment of rating.

The only practical basis for imposing local taxation equitably is to assess all property on the same basis, and to see that no property escapes being assessed at its real value, and this if properly carried out will, if all rates are levied on the assessment, as between the different classes of property, adjust the inequalities of local rates as far as practicable.

Some property no doubt benefits more in proportion than another from any given item of local expenditure, but the advantage gained on one item must be set off against the disadvantage on the other items, unless the impossible is attempted by trying to adjust local taxation in exact proportion to benefits received from local expenditure.

Under the present system of assessing property only those owners who have fully developed their property have the increment in their land fully assessed. The owners who retain their property in an undeveloped state, and neither sell it nor spend money in developing it, prevent the public from having the benefit of the property being utilised for purposes for which it is suitable, and at the same time are accumulating in the shape of unearned increment wealth which is capable of being realised into a capital sum if they choose to sell, or capable of producing an annual income if they choose to develop, without their property being subject to bear its fair share of the local taxation. This arises from the fact that the basis of assessment is the annual value of the property in its present condition, and although by reason of expenditure out of the rates the property referred to has been placed in a position of being capable of being developed to the best advantage, and owing to the demand for land the market value of it may have become increased tenfold, still it is probably assessed at about the same amount as it was when the market value was one-tenth of its present value.

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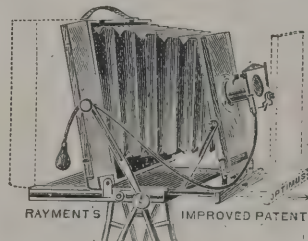
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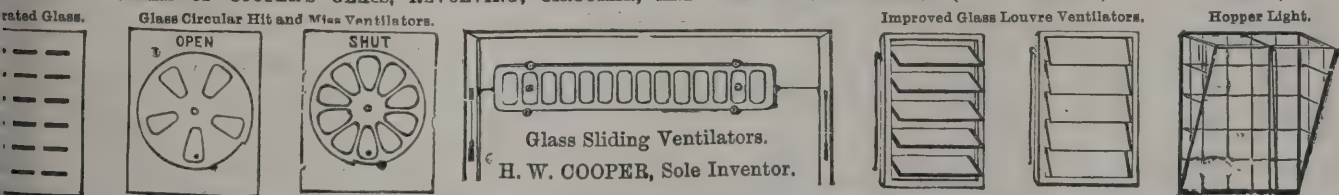
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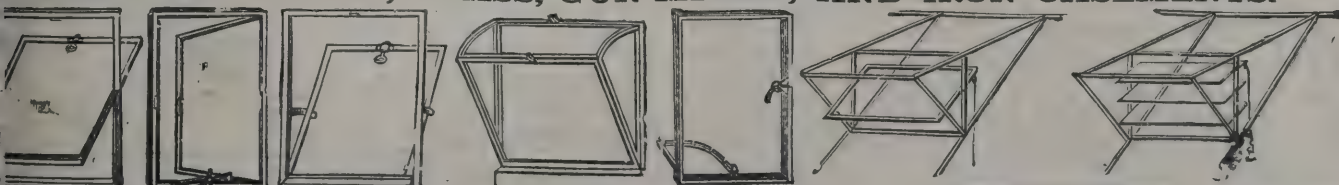


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it ought to bear, and as between one owner and another the assessment is inequitable.

If an owner chooses to allow his investment in land to remain unchanged because he thinks the capital value of the investment will increase he has a right to do so, but his land ought not to escape proper taxation in proportion to its varying value on that account.

The committee, therefore, recommend that the law of assessment should be altered so as to enable all land to be assessed on an annual value based on the real market value of the land from year to year; and that in the case of land and buildings the assessment should be arrived at by adding the annual value of the land. Under this system property which is fully developed will bear the same assessment as under the present system, but the owner who will not allow his land to be developed will have the land itself assessed on the same basis that the adjoining developed land is assessed, assuming that in both cases the real capital value is the same.

In this report the committee do not propose to do more than give this general outline of the scheme, but it may be added that they see no practical difficulty in carrying it out in detail.

With regard to the portion of the unearned increment in land which the public should take, it appears to the committee that when land is properly assessed in the way indicated, the contribution made by each property in the shape of rates is a fair sum, and to attempt to levy special charges on actual or estimated exceptional benefits, by a process which involves the exercise of a discretion by an elective body or by an arbitrator, must lead to inequality and uncertainty in its application.

If the alterations in the law proposed in this report are carried into effect, a very considerable benefit will immediately afterwards accrue to the ratepayers in every town, and the committee, while fully appreciating the efforts of those who have attempted through "betterment" to bring about a more equitable adjustment of local taxation, think it will be better for the corporations, who are members of this Association, to devote their energies to carrying through these amendments in the law which will be of some real use to every corporation in the country, rather than spend time in advocating a principle which, if adopted by Parliament, will, under the most favourable circumstances, only be a comparatively small advantage to a few corporations who in future obtain Acts of Parliament for street improvements, and years may elapse before even that advantage will accrue.

THE DECAY OF THE IRON INDUSTRY.

AN important article on this subject has been contributed to the *Times* by a correspondent. The statistics of the production of pig-iron for the first half of 1894, which have this week been issued by the British Iron Trade Association, show, he says, that although the output for that period was more than for the corresponding half of 1893, it is still much behind the output of a few years ago. On the other hand, it is a subject for both surprise and congratulation that we have again recovered, at any rate for a time, the supremacy in the production of iron which in 1890 we resigned in favour of the United States, and stand once more at the head of the iron-producing nations of the world in the matter of output.

In order that the circumstances of the British iron trade in reference to production may be appreciated, we append the statistics of the output for each of the years 1883 and 1893:—

	1883.	1893.
	Tons.	Tons.
Production of pig-iron	8,490,000	6,830,000
" " manufactured iron	2,730,000	1,364,000
" " Bessemer steel	1,553,000	1,493,000
" " open-hearth steel	455,000	1,456,000
Totals	13,228,000	11,143,000

These figures show that in spite of an increase of more than a million tons of open-hearth steel in the interval the total quantity of material produced fell off to the extent of considerably over two millions of tons, the decrease being more especially noticeable in pig-iron and manufactured or wrought-iron. The decline in the latter branch of the trade is not, however, so much a matter for anxiety as the wrought-iron industry has been a decaying one for years, and its decay has been almost as marked in some other countries—and more particularly in the United States—as in our own. It is the enormous absolute decline, as compared with the previous corresponding period, that specially arrests attention. Between 1873 and 1883 we increased the output of our iron and steel works by 3,268,000 tons, or 33 per cent., while in the period 1883-93 we fell off by 2,085,000 tons, or 16 per cent.

If these facts stood alone they would be sufficiently alarming, but unfortunately they are allied to other facts that are perhaps still more likely to excite apprehension. In 1883 our

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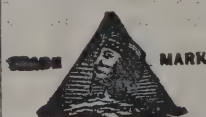
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total exports of iron and steel amounted to 4,043,000 tons, valued at 28,590,000*l.*, whereas in the year 1893 our corresponding exports only reached 2,911,000 tons, of the declared aggregate value of 20,609,000*l.* It is a somewhat remarkable coincidence that the decline of 1,132,000 tons in the volume of our exports exactly corresponds with the total quantity of the exports of iron and steel from Germany in the year 1892. This, however, does not mean that the German exports have grown to this extent, or even at all, during the period in question. On the contrary, it appears that the total volume of German exports of iron and steel in 1883 were, like those of our own country, larger than in 1892, but the Germans in the interval have greatly improved their position by exporting less of pig and more of finished iron and steel. The same remark applies to Belgium, our next most important competitor, which exported 434,000 tons of iron and steel in 1883, as against only 406,000 tons in 1893. But while other countries have also diminished their exports, as between the two periods, it will be observed that the falling-off in the exports of British iron and steel is much larger than in the other cases referred to. It is manifest, in short, that the world has been consuming a greatly-reduced volume of iron and steel, and probably it was largely inevitable that Great Britain, as the chief exporting country, should be the greatest sufferer thereby.

This circumstance, however, does not adequately or satisfactorily account for two other facts of fundamental importance—the first that the production of British iron and steel has largely fallen off relatively to that of other countries, and the next that the imports of iron and steel into Great Britain have largely increased relatively to the exports of the same class of goods from that country. The imports of manufactured iron and steel may be classed in three categories—the first being Swedish bar iron from the crucible steel industry, which we import to the extent of nearly 100,000 tons and to the value of about a million sterling a year, and which, being purchased merely for the sake of its extreme purity, is imported quite apart from considerations of competitive prices, &c.; the second being beams, girders and pillars received chiefly from Belgium and imported because of their cheapness; and the third being miscellaneous manufactures of iron and steel—such as wheels, tires, axles, wire and castings, which we mainly receive from Germany, and which again are imported because English firms cannot produce them so cheaply as they can be imported. England still leads the world in the production of cheap pig-iron, which is the basis of the whole super-

structure of iron and steel exports, but we have of late years been falling behind in the economical production of the finished forms of the material, where cheap labour becomes the principal factor to be reckoned with. Continental producers have, in addition to cheaper labour, the further advantages of cheaper railway freights, cheaper shipping charges, and cheaper methods of placing their orders. Finally, it is an open secret that in German competition, at all events, contracts are often made at less than the actual cost of production. In other words, the Germans, being protected in their own markets by a virtually prohibitory tariff, and being thus enabled to depend upon remunerative prices at home, find that it serves their purpose to keep their works as far as possible fully employed and take what prices they can get outside for the balance not consumed at home. In this way the Germans have for many years past had two scales of prices—one for home markets, which was relatively high, and another for outside markets, which was relatively low. English manufacturers are, therefore, not always beaten on their merits, and this system of what they call unfair competition has been a sore point for a number of years past—the more so that the case becomes worse instead of better. It was made the subject of a bitter complaint on the part of the President of the Iron and Steel Institute in his last presidential address to that body, and it was afterwards dealt with in a severe article by a writer in the *Kölnische Zeitung*, who retorted that England had no reason to complain of unfair competition on the part of other countries, seeing that in a large number of specifications drawn up for orders for English and colonial railways for the English Admiralty and otherwise, foreign iron and steel were expressly excluded. The whole question has, in short, entered upon the phase and assumed the dimensions of a pretty little quarrel, and has tended somewhat to strain the usually seemingly cordial relations of the metallurgists of the two countries.

Shipping charges have of late tended to prejudice the English iron industry almost as much as high rates of railway freight. It is an open secret that for a considerable time past there has been a shipping “ring” at work, which has kept up a specially high range of shipping freights from English ports, so much so that English shippers have often found that they could do better by shipping *via* Hamburg or Antwerp than by shipping from London or Liverpool. Antwerp and Hamburg rates are at least 5*s.* per ton below those of London, while in Liverpool the steam rates are always the London rates *plus* the cost of carriage from works to London, or say, 7*s.* 6*d.* above the

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rates from the Thames. At this moment German firms can ship to Australian ports at 5s. per ton less than English firms can ship from English ports, and this fact has greatly assisted the Germans in their competition with the English iron trade in Indian and colonial markets. And the worst of it is that in consequence of some firms having recently joined the "ring" that had hitherto kept aloof from it, the rates from most of the English ports have recently been advanced by from 15 to 30 per cent. In the South American trade, again, English steamers complete discharging at Antwerp and begin their loading at that port, and they are willing to take freight at rates from 2s. 6d. to 5s. below the rates that English manufacturers have to pay by the same vessels when they come to Liverpool to complete their loading. In the matter of shipping, moreover, German firms have had a considerable "pull" by the opening of the Manchester Ship Canal, which enables them to send finished wire right into the heart of Lancashire for less than it costs the numerous wire-making firms in Manchester and Warrington to produce it.

There is, however, another cause of the decay of the iron and steel industries of Great Britain that is at least as potent as any that have yet been named. The attitude and action of labour has of late years placed English manufacturers at a very serious disadvantage. This has been especially the case during the last three years, chiefly owing to the great coal strikes in Durham, the Midlands and Scotland. The Durham strike of 1892 caused the make of pig-iron in Cleveland to fall off by 685,000 tons, and that of Cumberland and Lancashire by 245,000 tons, as compared with the previous year, which means a reduced output in those districts alone of 930,000 tons, and a money loss to the pig-iron industry, as such, of more than two millions sterling. The strike of miners in the Midlands in the following year caused the output of pig-iron in the Midland iron-making districts to fall off by 360,000 tons, and led to a drop of 193,300 tons in the output of Scotland, in consequence of the Scotch ironmasters finding it to be more to their advantage to send their coal into England while prices were high than to use it in the manufacture of pig-iron. Finally, the Scotch miners' strike now pending is understood to have caused for the time being a complete paralysis of both the pig and the finished branches of the trade, practically all the iron and steel works, as well as the great majority of the blast furnaces, having been laid off entirely, and production having thus been brought to a complete standstill. These periodical labour crises do great permanent injury to trades that are so vitally

affected by them as the iron and steel industries, apart from the immediate and direct losses involved, and it is greatly to be feared that this cause has at least had as much to do with the serious collapse of our iron and steel industries as the outside influences that have been less under our own control. This mischief has a threefold character. Apart from the loss that is caused at the moment, such strikes discourage capital, prevent our manufacturers from fulfilling contracts, and entail the requirement of a higher return, where that is possible, for the risks involved, thereby raising more or less permanently the cost of production and increasing our disadvantage in outside competition.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 16740. Sydney Harrington Bromley, for "An improved machine for pressing bricks."
- 16748. Henry Ingaltton Sanders and William Matthews, for "Improved apparatus for flushing water-closets."
- 16764. James Harris, for "Improvements in sash-fasteners."
- 16812. Robert Heinrich Wilhelm Rump, for "Improvements in French windows or casements."
- 16917. George Cornelius Bullock, for "Improvements in window-sash fasteners."
- 16924. Henry Edward Burnet, for "An improved drain and soil-pipe testing apparatus."
- 16958. Henry Robson and George Jones Calder, for "Improvements connected with wheelbarrows."
- 16972. Alfred Gough, for "Improvements in window-blind appliances."
- 17030. Charles Collyer Free, for "Stove or range with adjustable fire-grate."
- 17119. John Byfield, for "Sash-fasteners suitable for window-sashes, &c."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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CONTRACTS OPEN.

ABERDEEN.—Oct. 3.—For Building Stables and Carriage Shed. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

ABINGDON.—Oct. 9.—For the Erection of Twenty-four Artisans' Dwellings. Mr. J. G. T. West, M.S.A., The Knowl, Abingdon.

BALTINGLASS.—Oct. 6.—For Building Labourers' Cottages. Mr. R. Ralph Dagg, Clerk, The Workhouse.

BASFORD.—Oct. 22.—For Erection of Buildings for Infectious Diseases Hospital. Mr. Herbert Walker, Architect, Newcastle Chambers, Nottingham.

BATH.—Sept. 28.—For Building Schools. Messrs. Browne & Gill, Architects, 1 Fountain Buildings, Bath.

BATLEY CARR.—Oct. 5.—For Building Warehouse. Messrs. P. Spencer & Son, Architects, Batley Carr.

BELFAST.—Oct. 1.—For Building Warehouse. Mr. Robert Watt, Architect, 77A Victoria Street, Belfast.

BELPER.—Oct. 1.—For Alterations at Pottery. Mr. Maurice Hunter, Architect, King Street, Belper.

BIRKENHEAD.—Oct. 18.—For Building Fire Station. The Borough Engineer.

BRIGHTON.—Sept. 28.—For Erection of Refuse Destructor Buildings and Chimney Shaft. Mr. Francis J. C. May, Town Hall, Brighton.

CADOXTON.—Oct. 12.—For Additions to Board Schools. Mr. G. Thomas, Architect, Queen's Chambers, Cardiff.

CARLISLE.—Oct. 1.—For Alterations to Premises. Messrs. Johnstone Bros., Architects, 39 Lowther Street, Carlisle.

CHELMSFORD.—Sept. 29.—For Building Cottages. Mr. F. Whitmore, Architect, 21 Duke Street, Chelmsford.

CHESTERFIELD.—Oct. 2.—For Building Girls' School at Glasswell. Messrs. Rollinson & Son, Architects, 13 Corporation Street, Chesterfield.

CROOK.—Oct. 3.—For Building Teacher's House at Board Schools. Mr. Ralph Dixon, Clerk, West Road House, Crook, co. Durham.

DARENTH.—Oct. 1.—For the Erection of Fire Escape Staircases at the School for Imbeciles. Messrs. A. & C. Harston, 15 Leadenhall Street.

DARWEN.—Oct. 1.—For Additions to Co-operative Stores. Mr. J. B. Thornley, Architect, Market Street, Darwen.

DORCHESTER.—Oct. 2.—For Building Isolation Hospital, Administrative Block, &c. Mr. G. J. Hunt, Borough Engineer.

DUBLIN.—Oct. 1.—For the Construction of a Refuse Destructor. Mr. Spencer Harty, City Hall, Dublin.

FAIRFIELD.—For Building Pair of Semi-Detached Villas. Mr. J. H. Burton, Architect, Warrington Street, Ashton-under-Lyne.

GRAFFHAM.—Oct. 5.—For Additions, &c., to Infant School. Mr. H. W. Grainge, Graffham, Petworth.

GILLINGHAM.—Oct. 10.—For the Erection of a Public Elementary School. Mr. E. S. Atchison, 8 Waterloo Road, New Brompton.

GREAT WESTERN RAILWAY.—Oct. 8.—For the Supply of Stores (Bricks, Tiles, &c.). Mr. G. K. Mills, Paddington Station.

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GREAT WESTERN RAILWAY.—Oct. 9.—For Building Waiting Rooms, &c., Baschurch. The Engineer, Shrewsbury Station.

GREAT WESTERN RAILWAY.—Oct. 9.—For the Construction of Engine Shed, Engine Pits, Coal Bunk, &c., at Taunton. Mr. G. K. Mills, Paddington Station.

HALIFAX.—Oct. 3.—For Building Infants' School. Mr. Joseph F. Walsh, Architect, Waterhouse Chambers, Halifax.

HALSTEAD.—Oct. 1.—For Building Isolation Hospital, &c. Messrs. Goodey & Cressall, Architects, 2 Victoria Chambers, West Stockwell Street, Colchester.

HUDDERSFIELD.—Oct. 4.—For Alterations for Club Premises. Messrs. John Kirk & Sons, Architects, Huddersfield.

ILFORD.—Oct. 2.—For Building Addition to Porter's Lodge, Reconstructing Portion of Outlet Sewer, Painting and Other Works at the City of London Cemetery, Ilford, according to Plans and Specifications to be seen at the Office of the Engineer to the Commissioners, in the Guildhall, and the Superintendent's Office at the Cemetery. Mr. Henry Blake, Sewers' Office, Guildhall, E.C.

KEW BRIDGE.—Oct. 2.—For the Erection of Warehouses. Mr. J. H. Strachan, Clifden House, Boston Road, Brentford.

LLANDRINDOD WELLS.—For Building Villa. Messrs. A. B. & W. Scott Deakin, Architects, Shrewsbury.

LLANTILIO.—For Building Vicarage. Messrs. Halliday & Anderson, Architects, 19 Duke Street, Cardiff.

LONDON.—Oct. 15.—For the Erection of Second Portion of Enlargement of Post Office Savings Bank in Queen Victoria Street. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LONDON.—Oct. 15.—For Addition to the Patent Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

MIDLAND RAILWAY.—Sept. 29.—For Cleaning and Painting the Engine Sheds, Shops, &c., at Peterborough, Cleaning and Painting the Engine Sheds, Shops, &c. at Child's Hill. Company's Architect, Cavendish House, Derby.

NEWCASTLE-ON-TYNE.—Sept. 28.—For Building Church, Hall and Schools. Messrs. Marshall & Dick, Architects, 4 Northumberland Street, Newcastle.

PONTYPRIDD.—Oct. 8.—For Building Church. Mr. G. E. Halliday, Architect, 14 High Street, Cardiff.

REDRUTH.—Oct. 6.—For the Construction of a Storage Reservoir and Intake Works and the Supply, Laying and Jointing about Ten Miles Cast-iron Socket Pipes and Appendages. Mr. H. Bertram Nichols, A.M.I.C.E., 59 Corporation Street, Birmingham.

ROYSTON.—Oct. 4.—For Building Board Schools. Messrs. Senior & Clegg, Architects, 15 Regent Street, Barnsley.

SEAFORD.—Oct. 3.—For Building Infants' School. Mr. W. Kent, North House, Seaford.

SHEFFIELD.—Sept. 29.—For Building Cottages. The City Surveyor.

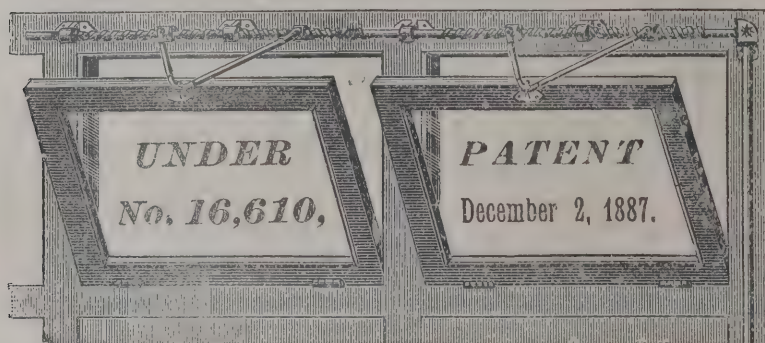
SHEPTON MALLET.—Oct. 1.—For Alterations and Additions to Sewage Tanks, Erection of Filter-pressing Works and Small Store. Messrs. John Taylor, Sons & Santo Crimp, 27 Great George Street, Westminster.

ST. GEORGE.—Oct. 9.—For Building Board School. Mr. John Mackay, Architect, Kingswood, Gloucestershire.

TOTTENHAM.—Oct. 2.—For the Erection of Boundary Fence Walls, Fences and Gates at North-Eastern Fever Hospital. Messrs. A. & C. Harston, 15 Leadenhall Street, E.C.

WINCHMORE HILL.—Oct. 5.—For the Erection of a Double Pavilion and Additions to Laundries at Northern Fever Hospital. Mr. T. Duncombe Mann, Norfolk House, Norfolk Street, W.C.

At the meeting of the Bridgnorth Board of Guardians, it was reported that the visiting committee had thoroughly gone into the matter of the proposed alterations. It was proposed that for the roof over the labour cells slate be substituted for concrete, and that the cells be paved with half-blue bricks, and that there be a Yorkshire stone staircase instead of concrete. It would save about 50%. The tender of Messrs. Bickerton & Maddock, contractors, Shrewsbury, for 1,890*l.*, it was decided should be accepted subject to certain modifications, if necessary.



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Number of Patent, 16,610,

Dated December 2, 1887.



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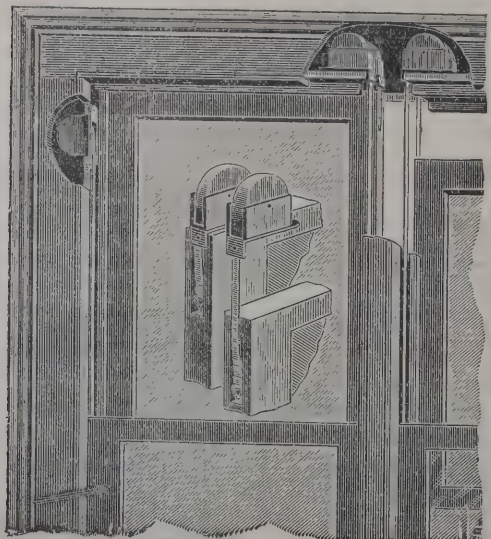
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TENDERS.

ABERCARN.

For Constructing Steel Lattice Girder Bridge, with Stone Abutments, over River Ebbw, Chapel Farm, Cwmarn, Abercarn. Mr. GEORGE STEPHENS, Surveyor, Local Board Offices, Abercarn.		
Dempster & Co., Elland	£672	0 0
W. A. Baker & Co., Newport	622	12 9
Isca Foundry Co., Newport	621	0 0
J. Moseley, Pontypool	610	0 0
Downay & Co., Cardiff and London	600	0 0
Fairbank, Newport	584	0 0
T. D. Steel, Newport	556	0 0
E. H. Page, Cardiff	508	4 6
ABERCARN ENGINEERING CO., Abercarn (accepted)	520	0 0
Finch & Co., Limited, Chepstow	480	0 0

ALFORD.

For Building Dwelling-house, Alford, Aberdeen. Mr. GEORGE GRAY, Architect, Inverurie.

Accepted Tenders.

W. Lauder, Inverurie, mason	£289	0 0
G. Mitchell, Montgarrie, Alford, carpenter	218	0 0
J. Laing & Sons, Inverurie, plumber	94	19 0
R. Moir, Inverurie, plasterer	72	17 0
C. McDonald, Alford, slater	51	16 0
J. Sutherland & Son, Inverurie, painter	39	8 0

ASHINGTON.

For Miners' Hall for 2,000, Ashington. Messrs. BOOLDS & HARDY, Architects, Bridge Street, Morpeth.
D. M. SPENCE, Amble, Northumberland (accepted).

DEWSBURY.

For Altering Fronts, &c., of Shops 36 and 38 Northgate. Mr. H. C. MARKS, Engineer, Dewsbury.

W. Scott & Sons, Dewsbury	£428	8 8
J. Richardson & Son, Staincliffe	415	12 0
T. Fawcett & Son, Dewsbury	411	17 1
J. Snowden & Son, Ossett	400	0 0
Gorthwaite & Blackburn, Dewsbury	380	0 0
S. Armitage & Sons, Dewsbury	375	15 0
W. H. CLEGG, Dewsbury (accepted)	368	19 4
Engineer's estimate	375	0 0

FARNHAM.

For Bathroom and Water-closet for Sick Men's Wards at Workhouse, Farnham. Mr. STAPLEY, Architect, West Street, Farnham.

J. Kimber	£73	10 0
E. T. Lee, Aldershot	73	0 0
H. Patrick	72	10 0
F. German	65	0 0
A. FIGG (accepted)	63	10 0

GLOUCESTER.

For Building Boundary Wall between Corporation Land and Private Property. Mr. R. READ, City Surveyor.

Freeman & Jones, Gloucester	£310	0 0
T. Allard, Gloucester	288	12 0
A. H. Lewis, Gloucester	265	0 0
S. Bradley, Frampton-on-Severn	252	0 0
E. Clutterbuck, Gloucester	235	5 0
GURNEY BROS., Gloucester (accepted)	220	0 0

KINGSTON-BY-SEA.

For Building Six Terrace Houses, Kingston-by-Sea. Mr. G. CECIL FARR, Architect, Lower Road, Shoreham.

Saunders & Sons, Brighton	£1,594	0 0
Brown & Sons, Brighton	1,581	0 0
A. Crouch, Worthing	1,580	0 0
J. Rooke, Southwick	1,575	0 0
G. Gilliam, Southwick	1,435	0 0
J. Willett, Shoreham	1,415	0 0

KNOWLE.

For Sanitary Additions and Drainage to Hants County Asylum, Knowle, near Fareham. Mr. J. ROBINSON, County Surveyor, Winchester.

B. COOKE & Co., Battersea (accepted)	£8,074	0 0
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LONDON.

For Erection of Premises, Nos. 40 and 42 Powis Street, Woolwich, S.E., for Mr. E. Carter. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 15 Kyverdale Road, Stoke Newington, N.

Multon & Wallis	£2,125	0 0
Young & Lonsdale	2,080	0 0
Balaam Bros.	2,060	0 0
E. Proctor	1,995	0 0
H. Brown	1,970	0 0
J. Chapman	1,937	0 0
H. L. Holloway	1,930	0 0

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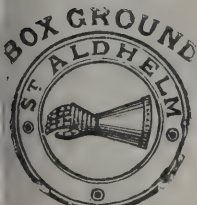
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For Erection of Premises, Nos. 26 and 28 Powis Street, Woolwich, S.E., for Mr. H. J. Smith. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 15 Kyverdale Road, Stoke Newington, N.

Multon & Wallis	£1,999	0	0
J. Chapman	1,938	0	0
W. Martin	1,900	0	0
T. D. Leng	1,890	0	0
Young & Lonsdale	1,860	0	0
H. Brown	1,815	0	0
Balaam Bros.	1,800	0	0
H. L. Holloway	1,800	0	0
E. Proctor	1,772	0	0

For Erection of Stables, &c., in the Coleraine Road, Westcombe Park, S.E., for Mr. E. Pembroke. Messrs. EDMESTON & GABRIEL, Architects, 42 Old Broad St, E.C. Quantities by Messrs. PARR & SONS, Broad St. House, E.C.

Havill	£1,812	0	0
W. A. Prior	1,800	0	0
Banks	1,743	0	0
Godson & Sons	1,695	0	0
Jerrard	1,689	0	0
Young & Lonsdale	1,675	0	0
J. Carmichael	1,639	0	0
Balaam Bros.	1,560	0	0

For Erection of Surveyor's Offices, at Wandsworth, for the Wandsworth District Board of Works. Mr. COLLINGS B. YOUNG, Architect, 28 Cockspur Street, S.W. Quantities by Mr. WILLIAM MILLS.

	Amount of Tender.	Extra for Portland Stone	Fittings.	Total.
R. S. Ronald	£2,690	£42 0	£84 0	£2,814 0
Holloway Bros.	2,355	47 10	130 0	2,532 10
Turtle & Appleton	2,276	49 0	77 0	2,402 0
Adamson & Son	2,263	28 10	103 10	2,395 0
J. Carmichael	2,265	33 0	89 0	2,387 0
C. Horton	2,330	47 10	No fittings	2,377 10
H. Brown	2,230	60 0	81 0	2,371 0
Parsons & Co.	2,244	45 0	79 0	2,368 0
R. A. Jewell	2,194	44 2	71 8	2,309 10
J. Allen & Sons	2,125	52 0	130 0	2,307 0
Johnson & Co.	2,120	48 0	83 0	2,251 0
LORDEN & SON (accepted)	2,100	57 0	79 15	2,236 15
Gregory & Co.	2,077	22 15	82 10	2,182 5

PLUMSTEAD.

For Works, Griffin Road, Plumstead. Mr. W. C. Gow, Surveyor.

Asphaltic Company	£881	18	9
Fry Bros., Greenwich	804	9	8
Mayo & Co., Brixton	790	10	0
H. Crane, Finchley	766	18	0
J. Mowlem & Co.	728	0	0
W. H. Wheeler, Southwark	711	18	0
Hobman & Co., Bermondsey (tar paving only)	164	9	0

QUEENSBURY.

For Building Five Through Houses, New Dolphin, Queensbury. Mr. JOHN DRAKE, Architect, Winterbank, Queensbury.

Accepted Tenders.

Day & Hainsworth, Bradford, mason	£540	0	0
S. Benn, Queensbury, joiner	192	19	6
A. Blakeborough, plasterer	49	15	0
M. Stocks, Queensbury, plumber	27	16	0
G. Fletcher, Queensbury, painter	22	0	0
A. Blakeborough, Bradshaw, slater	20	10	0

RUABON.

For Additions to Board Schools, Ruabon.

Jenkins & Jones, Johnstown	£365	0	0
H. & J. Jones, Ponkey	275	0	0
J. DAVIES, Ruabon (accepted)	245	15	0

WALSALL.

For Cookery Kitchen and Pupil Teachers' Classroom, School Board Offices, for the Walsall School Board. Messrs. BAILEY & McCONNAL, Architects, Walsall.

G. W. Blackwall, Walsall	£1,813	16	0
T. Tildesley, Willenhall	1,800	0	0
W. Bishop, Birmingham	1,721	0	0
W. Wistance, Walsall	1,675	0	0
W. Hendrick, Walsall	1,674	0	0
R. M. Hughes, Birmingham	1,621	0	0
J. Mallin, West Bromwich	1,613	0	0
J. Harley & Son, Smethwick	1,589	0	0
A. Bantock & Co., Walsall	1,560	0	0
C. A. Horton, Brierley Hill	1,498	0	0
Exors. of J. Lynex, Walsall	1,495	0	0
W. & J. Webb, Birmingham	1,490	0	0
W. HOPKINS, Birmingham (accepted)	1,480	0	0
C. Copeland, Brownhills	1,320	12	0

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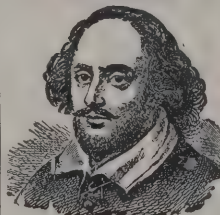
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W. Glover & Sons, Warwick	78 15 0
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Dutton & Co., Worcester	65 2 0
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E. Forshaw & Son, Warrington	63 0 0
M. Newsome, Sons & Speddings, Dewsbury	60 7 0
W. Munday & Sons, Bradford	60 0 0
D. Parsons & Sons, Pensnett	59 1 3
J. Hill & Sons, Wolverhampton	57 15 0
W. Smith & Sons, Barnard Castle	56 0 0
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J. Downes, Wakefield	55 0 0
J. Smethurst & Son, Warrington	55 0 0
D. Pilling, Colne	52 10 0
Newton, Chambers & Co., Sheffield	52 10 0
Picksley, Sims & Co., Manchester	52 10 0
W. Hamer & Son, Northwich	52 10 0
Foster Bros. & Co., Preston	51 17 6
Douglas Forge Company, Wigan	50 0 0
Smith, Patterson & Co., Blaydon-on-Tyne	48 11 3
Executors of D. Clark, Carlisle	48 0 0
J. Lees & Sons, Gomersal	47 0 0
W. HALSTEAD & Son, Rochdale (accepted)	46 0 0

WORSBOROUGH.

For Alterations to Worsborough Common Board Schools and Erection of Infant School, for the Worsborough School Board. Messrs. SENIOR & CLEGG, Architects, 15 Regent Street, Barnsley.

Accepted Tenders.

C. Lawton & Sons, Barnsley, mason	£1,529 0 0
Hammerton's Exors, Worsborough Dale, carpenter and joiner	552 0 0
Snowden & Sons, Ossett, plumber	177 0 0
E. Fleming, slater	149 10 0
E. Fleming, Barnsley, plasterer	85 0 0
W. Todd, Barnsley, painter	27 0 0

WATERFORD.

For Construction of Waterworks, Tramore, for the Guardians of Waterford Union.

J. Cunningham, Dublin	£6,172 0 0
R. W. Johnson, Cork	5,802 3 2
M. Walsh, Foynes	5,419 12 2
P. Harney, Waterford	4,325 17 9
HICKSON & PEAT, Tralee (accepted)	3,926 10 11

ELECTRICAL.

THE arrangements of the Corporation of Dewsbury for supplying electric light are nearly complete. The new lighting station is a substantial structure, consisting of engine-room, boiler-house and battery-room. It is situated on the site of the old gasworks in Bradford Road, and has been erected at a cost of a little over 3,500*l*. Mr. Mark Scott, of Earlsheaton, is the contractor. Two 100-kilo Watt machines and one 50-kilo Watt machine have been supplied by Messrs. Crompton, London, the dynamos being coupled direct to the engines. A local firm, Messrs. J. & J. Horsfield, have put in the boilers. The mains have been laid by Messrs. Siemens Bros. & Co., London, their contract amounting to 3,856*l*. The area in which the Board of Trade, by their provisional order, made it compulsory for the Corporation to lay mains comprises the market-place, Daisy Hill, Long Causeway, Church Street, Northgate, a portion of Bradford Road, and Wellington Road to the top of Nelson Street. The low-tension three-wire system is the system that has been adopted. Mr. W. H. Preece, now the chief electrical engineer to the Post Office, devised the scheme, which, partly under Mr. Preece's own superintendence and partly under the superintendence of Mr. A. K. Greener, A.I.E.E., has now almost been carried out. Mr. J. B. Mitchell, of Bradford, has been appointed manager of the new station. It is the intention of the Corporation to supply through meter at 6*d*. per unit, this being about as expensive to a consumer as using gas at 3*s*. per 1,000. A shopkeeper will be able to obtain the same illuminating power which he now gets from gas at practically the same price.

THE electric-light installation at Harrod's Stores has now been thoroughly overhauled and completed, and a large extension of arc and incandescent lamps has been made, the lighting of some eighty arc lamps and several hundreds of incandescent fittings having been most satisfactorily accomplished.

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All the main cables are fitted throughout on the three-wire system, and are carried to all the departments from the new distributing board fixed in the basement near wine cellar. Near this point numbers of mitres cross and recross. Each circuit is carried through carefully, provision being made in many cases for further extensions should they be required. In the new toilet and manicure saloons some good specimens of hammered brass are to be seen finished in the Adams style, and designed specially to suit the character of the existing decorations, executed by Messrs. Raynes Smith & Co., of Finsbury Circus Buildings. In the photographic department a powerful exposure and printing lamp with adjustable reflecting-hood has been fixed, which is a novelty in arc lighting, a 50-ampere current being sent directly through the carbons without the intervention of the usual cumbrous regulating gear.

BUILDING AND BUILDERS.

THE lock-out in the building trade of Bolton and district, which has extended over many weeks, has just terminated, after a conference between the employers and the men. About 1,000 operatives were affected in the joinery, bricklaying, slating, plastering and plumbing trades. The dispute, which related to the introduction of stone-cutting machinery and other questions, has been ended by mutual concessions. The plumbers are still out, however, having declined the proposals offered.

THE extraordinary amount of house building which has been going on in all directions for some time past in Troon has made it desirable that additional street names should be found. Attempts to identify some of the localities by random titles conferred on them have, it is stated, recently been rather puzzling.

IT is proposed to build a new hotel in Bath on the site of the old Sydney College, at the end of Pulteney Street, adjoining the Sydney Gardens. The property, which includes the gardens, has been purchased by Mr. David Jones. The architect is Mr. John Whittingham, London, who designed the Grand Atlantic Hotel, at Weston-super-Mare.

THE Corporation of Sheffield are about to make their first venture as builders of artisans' dwellings. In carrying out the widening of Eyre Street, it is necessary to demolish 23 houses, most of them back-to-back dwellings. The Local Government Board made it a condition that the Corporation erect other

workmen's dwellings in place of those pulled down. The Corporation have accordingly offered contracts for the erection of seven dwellings.

AT the meeting of the Bradford School Board tenders were accepted for the erection of Byron Street School, amounting to 12,137*l.*, subject to the approval of the Education Department. The plans were for a higher boys and girls' school, giving accommodation for 420 girls and 420 boys, and there would also be accommodation in science and art rooms, chemical laboratory and lecture-hall for 374, making the total accommodation 1,214. The building would be in three storeys, the ground floor having four classrooms and two classes in the hall and a cookery classroom, the first floor comprising five classrooms and two classes in the assembly-hall, and the second floor containing two science and art classrooms, two art-rooms, a chemical laboratory and a lecture-hall seating 120. The rooms on the second floor for science and art would be used by both departments. The accommodation approved by the Education Department was 1,098, viz. 549 boys and 549 girls. The total cost would be 18,400*l.*, the total cost per head being 16*l.* 12*s.* 7*d.*, and the cost per head of the accommodation at ten square feet per child 9*l.* 17*s.* 9*d.*

TRADE NOTES.

THE Weybridge Schools, Weybridge, Surrey, are being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A NEW eight-day turret clock, striking the hours on the large bell, and showing the time upon two external dials painted and gilt, from the designs and plans of Lord Grimthorpe, has been erected in the tower of the parish church, South Kirkby, near Wakefield, the necessary work having been executed by Messrs. William Potts & Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne.

THE warming of St. Agatha's Church, Portsmouth, an illustration of which appeared lately in *The Architect*, has been placed in the hands of Mr. W. J. Fox, of South Place, Finsbury, and a very complete system of thoroughly warming so large an area has been arranged. Also the warming of St. Michael's Church, Camden Road, N.W., and St. Mary's Church, Woolwich (both of which churches have been recently enlarged), has been

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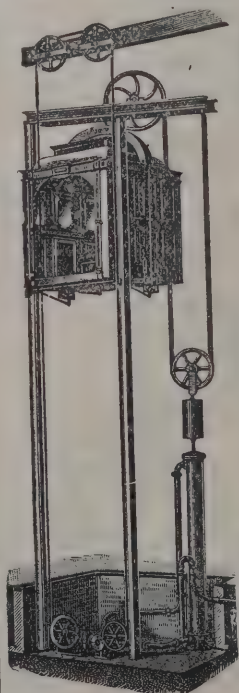
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carried out by him; also the new offices of Messrs. Nestle & Co., Cannon Street, E.C., will be heated by his apparatus.

THE No. 2 contract of the Pudsey sewerage scheme has been let to Mr. John Simpson, of Hunslet, for 3,100*l*.

IN connection with the Wilsden waterworks, Messrs. Stephen Greenwood & Son, of Wilsden, have got the order for digging and laying of pipes, which are to be supplied by Messrs. Chapham Bros., of Keighley; the hydrants, valves, &c., are to be made by Messrs. Blakeborough & Sons, of Brighouse.

VARIETIES.

ALREADY 700*l*. has been collected for the Infant Prince Fund for the Victoria Hospital for Children, Chelsea, to commemorate the birth of an heir to the English throne, of which a most fitting and generous contribution of 50*l*. has been made by the graduates, members and associates of the Children's Salon, the band of young gentlewomen who are working to endow beds in children's hospitals in connection with the *Gentlewoman* newspaper. Captain Blount, the secretary, will be glad to acknowledge further donations.

At the meeting of the Lord Provost's committee of the Edinburgh Town Council, Messrs. Cunningham, Blyth & Westland, engineers, submitted plans of the proposed new North Bridge, prepared in terms of instructions from the Corporation. The plans were approved and instructions given to advertise for offers for the work.

THE *Glasgow Herald* says:—All the ironworks in Coatbridge are now in full swing, or nearly so, having obtained supplies of coal at rates which enable them to carry on work. The blast furnaces are being prepared for restarting, and it is expected that in one or two cases the blast will be put on before the end of the week.

THE work of removing the mud accumulated in Boston Dock is suspended. During the present season the dredger has removed 27,840 tons at a cost of 724*l*.

AT the excursion meeting of the Durham and Northumberland Architectural Society the members visited Great Ayton and Newton in Cleveland, where interesting churches were examined. The most attractive place at Great Ayton was the old church, which was examined with special interest, the president of the Society, Rev. Dr. Greenwell, expressing pleasure at the fact that the old features had been retained whilst the

new church was being built. The architectural features were described very ably by Mr. C. C. Hodges. Newton Church was then visited. Here the Norman chancel and a rich Norman door and font came in for the largest measure of attention. At Guisborough the history of the church was given by Mr. Wm. Brown, and the architectural features were described by Mr. Hodges. The "Bruce Tomb" was also described by Mr. Brown.

THE Ayr Harbour Trustees have resolved to rebuild the wall on the south side of the harbour at a cost of 21,000*l*.

DEMOLITION OF A MILL CHIMNEY.

THE chimney of a corn mill in West Gore Street, Salford, which was recently destroyed by fire, has been taken down to make room for the new branch of the Lancashire and Yorkshire Railway from Windsor Bridge to the Salford Docks of the Ship Canal. The work was carried out under the direction of Mr. J. Smith, of Rochdale, the "Lancashire Steeple Jack." The chimney was 35 yards high. The method adopted was to remove a course of bricks at the foot, each brick as it was knocked out being replaced by a wood block. When the bricks had been withdrawn in such number that the chimney was almost entirely resting on its new support, the space below was filled with the materials for a fire. A light was applied, and in about a quarter of an hour the supports were burned through and the chimney leaned forward and fell in a mass. In the line of its fall was a gable wall of the old corn mill, which was brought down at the same time. The incident passed without mishap.

SEWAGE DISPOSAL.

AT the meeting of the Sanitary Congress in Liverpool, Dr. H. Littlejohn, of Sheffield, gave an address on the "Present position of the sewage disposal problem." He took it for granted that all sanitarians were agreed that the only method of sewage disposal consistent with modern civilisation and sanitary science was that by water carriage. It was now admitted after prolonged trial that all conservancy methods were practically failures, both as regarded results economically and as regarded what was of more importance—freedom from nuisance. The question of the effective treatment of sewage had assumed an importance that it was impossible to over-

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AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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estimate. Though a considerable number of sanitary authorities had attempted to deal with the question it must not be taken as representing that they had solved the problem of effectively dealing with their sewage.

Dr. George Reid, the medical officer of health, Staffordshire County Council, also read a paper on "Slop closets." He said that before coming to a conclusion as to whether slop closets might be accepted as substitutes for ordinary water-closets, their merits and demerits must be considered, and what was very important, the local conditions must be taken into account. Recent experiments in Stafford had shown that the answer to the question was not so simple as it would seem, and the arguments in favour of the slop closet system, based upon the diminution in the volume of sewage to be pumped and disposed of, appeared to be far outweighed by the complications which the system gave rise to in the purification process.

CROWDING HOUSES ON LAND.

AN address on the overcrowding of houses on land was given by Dr. Longstaff, of the London County Council, in Liverpool. Liverpool, he said, still was the densest city in Great Britain. A special form of overcrowding of buildings from which Liverpool and other northern towns suffered greatly was that known as "back-to-back" construction. Blocks of cottages built on this plan faced upon two streets without any intervening space, so that except at the ends each tenement had but one external wall. In addition to other grave disadvantages of the kind commonly called "sanitary," it was impossible to properly ventilate such houses, as a through current of air was out of the question, and it was difficult to light them adequately. The principle underlying the model by-laws of the Local Government Board, which had been adopted with variations by most of the large towns, were explained and contrasted with the "limiting angle," adopted in Liverpool and London. It was shown that the latter method interfered less with the discretion of the building owner. He thought that in some respects our sanitary law had already passed the just limit of interference with the liberty of the individual, but the evils of streets badly laid out and of houses improperly crowded upon the land were great, and withal so enduring, they could only be dealt with by an external controlling authority. He was convinced that this was one case in which legislature was bound to interfere and to confer ample powers upon the municipality.

JAPAN AND ENGLISH MACHINERY.

IN his last report from Yokohama, Consul Frazer says:—As a rule, the importation of manufactures of metals, machinery and the like, maintains its ground. Rails of English make have been in request, the demand coming now for the purposes of private lines. The bulk of the rails imported into the country were 60 lbs. and 50 lbs. sections, but there is a demand also for 20 lbs. and lighter sections for tram-work. Considerable orders for bridge-work for private lines have also been placed, as well as for locomotives. The former have mostly gone to England, whereas American locomotives seem to find favour with many of the Japanese railway engineers. The import of electric plant is also largely in the hands of Americans. Much of this is now, however, made in Japan. Projects for electric tramways are spoken of for some of the larger cities, but nothing has yet been actually done in this direction. Under the heading of machinery, that for spinning purposes again shows a considerable amount, owing to the continued development of the spinning industry in this country. In the report on the trade of Yokohama for the year 1890 it was remarked that the continental packing of machinery and plant was more careful than the English. The same is still true, and wonder is sometimes expressed that English makers should spend so much time in the making of machinery well, while they apparently take little pains to secure that it arrives at its destination in good condition. It may also be remarked that English makers do not pay so much attention to the get-up of specifications and drawings as their competitors do. They are apt too, apparently, to think that as data sent from here are often not very complete, business is not likely to result, and hence do not take much trouble to obtain it. The reason for more details not being supplied is that the Japanese engineers are not in most cases able to specify in detail what is wanted, and leave many details to the maker. At the same time, where suggestions are made by the former in the way of what they think improvements, it would be for the interest of the English maker that he paid as much attention to such suggestions as the continental maker appears to do. At the risk of repeating what has also been alluded to in a former report, it should be again noted here that it is not sufficient for makers at home to have travellers or experts visiting this country with a view to business. It is not to be expected that such can meet with much success, unless where working in concert with firms which have connections on the spot and local knowledge.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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THE MERSEY DOCKS.

THE report of the treasurer of the Mersey Dock Estate for July 1 last states that the total receipts of the Trust were 1,385,759 $\frac{1}{2}$ l., and the total expenditure 1,150,321 $\frac{1}{2}$ l. The rates on shipping and merchandise have brought in 1,071,224 $\frac{1}{2}$ l. The expenditure for interest upon the bond debt is 622,842 $\frac{1}{2}$ l., for the engineers' department 209,638 $\frac{1}{2}$ l., for the harbour masters' department 39,972 $\frac{1}{2}$ l. Of the credit balance of 235,437 $\frac{1}{2}$ l., the sum of 100,000 $\frac{1}{2}$ l. is paid to the sinking fund and the remainder variously appropriated. The treasurer also gives his usual returns of the shipping traffic of the port: 21,170 vessels paid rates amounting to 470,677 $\frac{1}{2}$ l., and the tonnage of these vessels was 9,960,902. There is an increase over the previous year both in tonnage and rates paid, but the returns are slightly behind 1891, the record year.

MOSAICS.*

THE art of inlaying small cubes of glass, stone, marble, plaster, enamel, shells, precious stones and wood has existed from the most remote times. "The pavement of red and blue and white and black marble," or "porphyry and marble and alabaster and stone of blue colour," mentioned in the Book of Esther as adorning the court of the garden of King Ahasuerus, was without doubt a pavement of mosaic work. The earliest but least interesting existing specimens of this work are those used in the ornamentation of ivory thrones and jewellery, and there are several beautiful examples of ivory carvings from Nineveh and Egypt in the British Museum, consisting principally of the figures of deities formed of the lotus and papyrus plants, which are enriched by the inlaying of lapis lazuli and other pseudo gems. Mosaics of a similar kind, but more ambitious, have been found in Lower Egypt, and these are the caps of columns, wall tiles, &c., of white limestone or earthenware, which are embellished by brilliantly coloured bits of glass or enamelled earthenware being let in. By the third century B.C. the art had made considerable strides, for we are informed that, in the great ship of Hiero, the tyrant of Syracuse, mosaic floors were laid down and were composed of coloured marbles, representing the whole of the Iliad, a work which occupied 300

workmen an entire year to execute. Another kind of mosaic was known to the Egyptians of this period, and was made entirely of glass; there is a fine specimen of this in the British Museum, representing the sacred hawk, every feather being accurately produced in the requisite shades of colour. The ingenious mode of manufacture is well worth describing. Numbers of long sticks of various coloured glass were arranged in such a way that their ends produced the figure of the hawk; other sticks of blue glass were placed all round, so as to form the ground. The bundle of sticks when looked at endwise now revealed the figure of the hawk with a blue background, but of a size much larger than that ultimately intended. To reduce the figures to the required size the bundle was heated till the sticks melted together, and thus softened, was then drawn out to a greatly diminished thickness, and it seems wonderful that the relative positions of the sticks of glass forming the design were not altered, and that the hawk was not transformed into a prize turkey. A slice of the rod was then cut off and its face polished, and revealed a thing of beauty and great delicacy, an additional advantage being that many slices of hawk could be cut from the same bundle. While on the subject of mosaic manufacture it would be well to describe what is known by surmise, and the descriptions given to us by Vitruvius of the process of making the Roman tessellated mosaics, traces of which are to be found wherever the Romans settled. The earth was first carefully rammed down to a firm and even surface; on this was laid a thick bed of stones, rubbish and lime from 6 to 9 inches deep, and above this another layer, 4 to 6 inches thick, of one part of lime to three of pounded brick, mixed with water; on this, while still soft, the pattern could be sketched out with a wooden or metal point, and the tesserae, or small bits of marble, stuck into it, with their smoothest side uppermost. Lime, pounded white marble and water were then mixed to the consistency of cream, forming a hard-setting cement called marmoratum. This white fluid was poured over the marble surface, and well brushed into all the interstices between the tesserae. When the concrete and cement were both set, the surface of the pavement was rubbed down and polished.

When the mosaic art was carried from Greece to Rome, it was known as *Opus Musivum* and was greatly in vogue, being applied to floors, walls and ceilings. Pompeii is wonderfully rich in examples; there is, indeed, scarcely a house which has been excavated that is without them. One of the most famous and interesting of these examples is known as *The Doves of*

* A paper by Mr. R. Bentley Young, read before the South Australian Society of Arts.

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the Capitol, found in the Villa of Hadrian, and which appears to be a copy or imitation of the Cantharus and Doves, the work of Sosus, over which Pliny goes into such raptures. The mosaic masterpiece of Sosus, though, is what is called *The Unswept House*, and depicts the remains of a banquet on the floor. In *The House of the Faun*, a minutely executed scene of *The Battle of Issus* was found, and is considered the chief classical historical picture in existence. It represents the moment of Alexander's victorious charge against the cavalry of Darius. There are many specimens of Roman mosaic work in England, the most beautiful of which are the pavements in the chapel of Edward the Confessor in Westminster Abbey, and in front of the tomb of Becket at Canterbury Cathedral. Some of the pavements found in Gloucestershire and Lincolnshire are very interesting; upon one is shown a monogram that may be seen in the catacombs, and a representation also of the Ichthys, or sacred fish, may be seen upon another—workmanship which is supposed to be older than the time of Constantine. In the nineteenth chapter of St. John, verse 13, the following is written:—"When Pilate, therefore, heard that saying, he brought Jesus forth and sat down in the place that is called the pavement," but in the Hebrew, Gabbatha, the Greek term being lithostratum, or disposition of stones, and consisting of cubes of marble and enamel intermixed. This, therefore, was evidently a tessellated pavement, and it has been remarked as a singular thing that Doré in his great picture of *Christ Leaving the Pretorium* should have entirely overlooked this fact, and lost the opportunity of rendering the only feature which is actually given as a realisable detail. Some of the finest early Roman marble mosaics are to be found in Algeria and Tunis, excellent marble abounding in the vicinity, an advantage which was not available to the Romans in Britain, where marble has rarely been used by them in pavement work. In the third century mosaics began to be employed in the service of Christianity, and became a beautiful vehicle of religious expression in the churches of the world, where it still holds powerful sway. Of these early mosaics that of St. Pudentiana is considered one of the finest. It dates from the fourth century, and is far in advance of contemporary work. M. Vitel, the French critic, says that in its composition appear "quite new treasures, chaste expressions, a flower of virtue, a moral grandeur, with which the most beautiful works of antiquity are but imperfectly imbued."

The Mediæval mosaics used to decorate walls and vaults, made of coloured glass cubes, marbles and glass in small

pieces, and made opaque by the addition of oxide of tin, are without doubt Byzantine in origin. The mosaics of St. Sophia and St. Saviour in Constantinople are of the sixth century, being identical in style with those of Italy of the same date. Tesserae of gold and silver were at this time much in use, and were made by spreading the metal leaf over a glass slab, and upon this slab a skin of colourless glass was fused, and the slab was then broken into cubes. *Opus Alexandrinum*, so-called from having been first introduced in the reign of Alexandrinus Severus, was made partly of small marble tesserae forming the main lines of the pattern, and partly of large pieces used. The finest example of this work is found at St. Mark's, Venice (twelfth century). The mosaics of the fifth and sixth centuries, as seen at Ravenna (a veritable city of mosaics) are considered quite equal to any of the twelfth-century work, at which time a mosaic revival set in, reaching a culmination of exceeding splendour in the fifteenth century. Some examples of this revival may be cited. One of the finest is without doubt the cathedral of Monreale, near Palermo, begun in 1174. Fergusson, in his "History of Architecture," says that "the architectural features in the buildings of which this cathedral is the type were subordinate in the eyes of their builders to the mosaic decorations, which cover every part of the interior, and are in fact the glory and pride of the edifice by which alone it is enabled to take rank amongst the finest of Mediæval churches. All the principal personages of the Bible are represented in the stiff but grand style of Greek art; they are separated and intermixed with arabesques and ornaments in colour and gold, making up a decoration unrivalled in its class by anything (except perhaps St. Mark's) the Middle Ages have produced. No specimen of opaque painting of its class on this side of the Alps can compete with it in any way." Fergusson also has much to say in praise of the beautiful mosaic pavements which adorn the Roman basilicas. "These," he says, "were always original, being designed for the buildings in which they are used and following the arrangement of the architecture surrounding them. The patterns, too, are always elegant and appropriate to the purpose, and, as the colours are in like manner generally harmoniously blended, they form not only a most appropriate but most beautiful basement to the architecture. A still more important feature was the great mosaic picture that always adorned the semi-dome of the apse, representing most generally the Saviour seated in glory surrounded by saints."

(To be concluded.)

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TOWN REFUSE.

PAPERS were read before the members assembled at the Sanitary Congress in Liverpool on methods of dealing with town refuse.

Mr. John A. Brodie, some time chief assistant to the Liverpool city engineer, read a paper in which he gave a description of recent improvements in refuse destructors, particularly alluding to the method of charging the Liverpool destructor. He also explained the principles of the destructor now being constructed for the Corporation of Cambridge, the special object sought to be attained being the generation of steam for sewage pumping purposes.

Mr. James Deas, manager of the Warrington destructor, gave a paper on the "Disposal of Town and Other Refuse by Burning." He pointed out that for many years past the question of dealing with the refuse in towns had occupied the attention of local and municipal authorities, and various schemes had been suggested to remedy the evil. All sanitary reformers and engineers were now agreed that the most economical system and the safest from a public health point of view was to destroy the refuse by fire. The necessary conditions for a perfect destructor were (1) to destroy rapidly all unscreened refuse without committing any offence or possible nuisance; (2) to reduce the refuse dealt with to the least possible amount of clinker, and (3) to deal with the refuse and by-products with the greatest economy and efficiency. In the new destructor at Warrington the above conditions were complied with and successfully carried out. The total height from

ground level to charging platform was only 8 feet 9 inches, half the height of the inclined roadway to other destructors. The refuse was tipped direct into the hopper, and fell down on to the inclined path where it was partially burnt and dried, and all the gases were absolutely destroyed by the radiation of the intense heat of the furnaces, by being drawn through and over the hottest part of the fire, entering into ignition and complete combustion in a chamber where a temperature of over 2,000 degrees was maintained, before finally passing away through the boiler. This intense heat and form of furnace disposed of the necessity of a secondary fire, dignified by the name of cremator. Mr. Carter Bell, the county analyst, had tested the escaping gases several times, and his report stated that he drew various samples of gases from the chamber at the foot of the chimney-shaft, and in no case did he find the slightest trace of sulphuretted hydrogen or mephitic vapours. There was no trace of carbonic acid. The daily amount of refuse burnt in the Warrington destructor equalled twenty tons per twenty-four hours, which far exceeded all other forms in use. Objection had been raised by persons viewing this destructor as to the high temperature attained and the possibility of the brickwork being rapidly burned away. An experience of thirteen months' continuous working did not confirm that opinion, as no repairs had been necessary and no expense incurred. During the process of burning fine particles of dust fixed themselves on the crown of the arch and exposed portions of the furnace in stalactitic form, thus protecting the brickwork from the intense heat. The furnace had been at work since August 1893, and was as good now as it was on the day it was erected. From daily experience he found he could evaporate one pound of water from one pound of unscreened town's refuse, and the value of steam, by burning town's refuse, would form a very important factor for corporations in the near future.

Mr. H. Royle, C.E., described "The Acme Refuse Destructor." The inventors of the Acme destructor, in their design, kept in view the necessity of complete combustion of all the organic matter, and not the merely putting it out of sight and smell. The refuse was tipped into the large receptacle or hopper, from whence it fell through the opening on to the sloping bars, which were set at about an angle of 45 deg., and as the organic or combustible portion burnt out, the residual material gradually fell to the lowest position, whence it was removed by the attendant at the front and side using a long shanked shovel. As quickly as it was removed a further quantity fell down the incline plane formed by the bars, which

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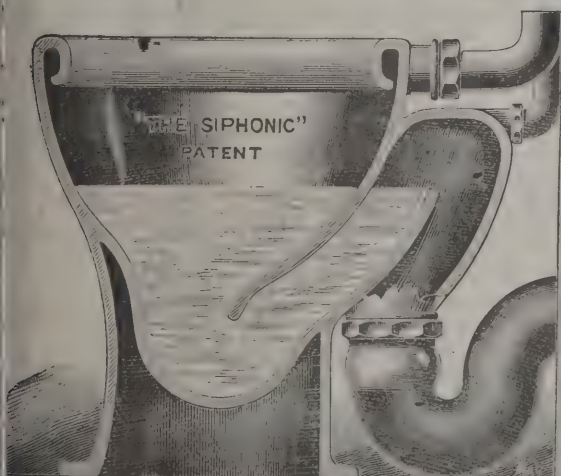
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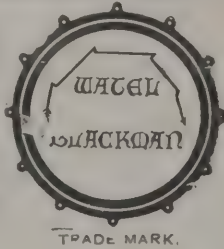
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in its turn was followed by a fresh portion from the hopper. Thus the feeding-in of the material was almost as gradual as though rocking-bars were employed. Although designed as a destructor only, it was as capable as any other of being adapted to the generating of steam when the material to be burned contained enough heat-producing material; it equally permitted the use of rocking-bars, as also the use of a steam or other blower being applied.

THE JOHANNESBURG HOSPITAL.

THE building forming the Johannesburg Hospital, of which Mr. Arthur H. Reid is architect, stand upon a site measuring 1,080 feet by 620 feet, and is surrounded on all sides by roadways. It is situated on the side of the hill to the north of the town, which it overlooks, and is approached by roadways with iron gates and brick piers to the two entrances. The main block of the building may roughly be divided into four sections, viz. the centre block, east wing, west wing and administration blocks. The centre block is devoted to private patients, surgical wards, convalescents' and waiting-rooms, office accommodation, storage and operating-room. The west wing is exclusively devoted to male patients; the east wing, on the ground floor, is also used by male patients, and on the first floor by females and children. The administration block is situated at the rear of the centre block, and comprises the kitchen with servants' quarters, and stores and matron's and nurses' quarters. Ascending a flight of cut stone steps at the front entrance, and entering the vestibule, which is in the centre tower, the visitor passes into the central corridor, off which the visitors' waiting-room is on the right and the dispensary on the left. The secretary's office adjoins the waiting-room, and before one enters the main corridor, which runs at right angles to the central corridor, there are three private wards to the right and left, each 10 feet by 9 feet by 12 feet 9 inches high, and also a private patients' day-room 12 feet by 9 feet. Continuing along the central corridor, one comes to two surgical wards, at the end of one of which is a passage leading to the operating-room. The main corridor, which is 150 feet by 8 feet by 14 feet 3 inches high, connects the east and west wings to the central block. Taking the east wing first, the visitor arrives at the lift-well, where patients are moved from floor to floor in their beds, with the attendants accompanying them.

At the end of the corridor there are general male wards to the right and left, that to the left being for ten beds and that to the right for six beds. Each of these wards has its own nurses' or ante-room, fitted with washing-trough and supplied with hot and cold water. At the end of the corridor also there is on the right-hand side a bathroom and lavatory. The west wing has almost precisely similar accommodation throughout. A new ward to accommodate twenty-five patients, with auxiliary kitchens and all necessary appurtenances, is now in course of construction in the rear of the administration block. In the latter there are kitchen, scullery, pantry, boiler-house and various other apartments, including a fumigating-room and a padded-room for violent patients. This portion of the building is now being enlarged, the extensions comprising napery-room, dispensary and dispenser's quarters. On the first floor the accommodation in the central block, as well as in the east and west wings, is generally the same as on the ground floor. The front portion of the central block contains six private wards, a private patient's day-room and a nurses' room in the tower, which is also fitted up as a dark room for ophthalmic examinations. The ordinary bed accommodation provided in the main block totals 101 beds, though on an emergency by curtailing the convalescents' day-room accommodation and overcrowding the other wards, 120 beds could easily be provided. For nurses the number of beds provided is thirty-one, including three beds in the infirmary. The new free ward will accommodate 25 patients. The native wards now have 65 beds, and the temporary hospital 26 more for sundry classes. The front portion of the central block is carried to a second floor, which is filled with cupboards and shelving for the storage of linen, bedding and appliances, as well as the clothing and belongings of living and deceased patients. The central tower is carried to a third storey, in which provision is made for a 6-foot dial clock case, which can be lighted up inside and would be seen from all parts of the town. The tower is 64 feet high from the ground to the top of the dome railing, which is surmounted by a flagstaff.

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bed; children's wards (temporary), 750 cubic feet per bed; native wards, 440 to 550 cubic feet per bed. The floor-space allotted to each bed is as follows:—Large general wards, 70 and 80 superficial feet per bed; surgical wards, ditto; private paying patients' wards, 90 to 120 superficial feet per bed; women's wards (temporary), no fixed space; children's wards (temporary), 80 superficial feet per bed; native wards, 40 superficial feet per bed. The sanitation is necessarily of a primitive description at present, on account of there being no underground drainage. Kitchen, laundry and house slops are run into tanks, which are emptied daily.

After mature deliberation the board, in carrying out a new drainage scheme for the hospital, decided to adopt the open gutter system, with Macfarlane's glass enamelled iron pipes only where the drains cross the roads or are in close proximity to inhabited quarters. The open drains or gutters will be constructed of cement concrete, plastered to a smooth surface inside with cement and tarred. To prevent accidents and to avoid chokage by the admission of earth or other matter from the ground surface, the drains will be protected by timber covers from end to end, in lengths of 15 feet each, fitted with lifting rings for ready removal for daily cleansing. To prevent surface flood water from entering the drains, they are kept above the natural surface of the ground, and banked up on each side. Where pipe drains are necessary, they will be of enamelled cast-iron, with concrete inspection and cleansing chambers every 50 feet. At the head of each branch drain an automatic flushing tank will be provided, which will cause a flush with the waste water itself instead of using clean water for the purpose. If necessary, these tanks can be charged with disinfectants. All grease will be intercepted by grease traps at the outlets of the scullery and other sinks, thus preventing chokage or other trouble from that source, while "ripples" or corrugations will be formed to the bottoms and sides of the grease traps. By this means any grease or fat that might, either through heating or overcharging of the grease traps, pass through them, would, by exposure to the cold air, naturally solidify and be retained by the "ripples" or corrugations on the surface of the open drains. These sections of the drains will of course require regular cleansing with such hot alkaline agents as experience may show to be most suitable. The waste water from the laundry will be clarified and disinfected by passing first through a scum trap, which will intercept all soapuds and solids, and then through a precipitating and disinfecting pit, both of which will be so

constructed as to be easily cleaned daily. The drainage liquids are divided into two classes, each having its own independent conduit, namely, the foul or possibly infectious liquids, and that which is clean or innocuous, such as lavatory or bathroom waste. The former is discharged into cemented tanks and then led by gravitation through pipes to a standpipe, whence it is discharged direct into a sanitary cart and removed. The latter is discharged into similar tanks and led by pipes to hydrants in the lower levels of the ground, where it is used for watering the trees, &c. Both these tanks are in duplicate, for the purpose of cleansing or repairing without interfering with the service, and at the same time, being built at different levels, the lower one will act as a reserve of any overflow that might take place, should the higher one not be emptied at any time. The heads of all branch drains will be fitted with automatic disinfectors, properly gauged to continuously discharge a solution of permanganate of potash or other disinfectant into the drains.

The heating of the hospital is effected by open register grates and coal fuel. The whole establishment is lighted by paraffin lamps. Water is supplied by the waterworks company into elevated tanks above the roof level. The rain-water, however, is conserved in underground brick cisterns, into which it is led by brick drains. Each rain-water down-pipe has a 40-gallon rivetted iron tank at its foot, with a separator, the overflow from which, being clean, is conducted into the underground cisterns. These separators intercept locusts and other contaminating agents. Hot water is laid on all over the building, to baths, lavatories and nurses' room, being supplied from a 6 horse-power independent vertical boiler. The architectural style adopted in the construction of the hospital buildings is Renaissance of a somewhat severe type. The principal contractors have been Messrs. Mudge & Dunstan and Messrs. H. & H. Beckett. Mr. James Toogood has acted as clerk of works throughout.

At Warwick a discovery has been made by some workmen while making alterations at the back of a house in Jury Street, of a subterranean passage. They were able to proceed for some distance, but were at last stopped by a solid block of masonry. The passage is 6 feet in height and 4 feet wide, and in some places appears hewn out of the solid rock. It is supposed to be one of those mentioned by Dugdale as being in connection with the Castle and is believed to have led to the old church.



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DOCTORS' COMMONS.

EXTENSIVE demolitions have been begun in St. Paul's Churchyard at the south-west angle of the cathedral, and the old house and archway, long known as the entrance to Doctors' Commons, will shortly be cleared away. This pile of buildings, which has been refaced in the past and present centuries, is the place where Sir Christopher Wren had his offices, and in the room over the archway the plans for St. Paul's Cathedral were designed and perfected. Messrs. Pawsons & Leaf's are enlarging their warehouse premises, having obtained a lease from the Ecclesiastical Commissioners, and intend to cover the whole ground in front of the deanery. The Post Office Savings Bank is about to be extended from Knight-bridge Street to Carter Lane, opposite the choir school of St. Paul's. Here, again, the owners and tenants are under notice to vacate their premises. The Vicar-General's office for marriage licenses will move on the 29th inst. to 3 Creed Lane, Ludgate Hill.

The history of Doctors' Commons is ancient and interesting. There was a college for the Professors of Civil and Canon Law in London as early as the eighth century. In February 1568, Dr. Henry Harvey, Dean of the Arches and Master of Trinity Hall (which was founded at Cambridge, chiefly for the study of the Civil and Common Law), procured from the Dean and Chapter of London a lease of Mountjoy House, in the parish of St. Benet's, Paul's Wharfe, for the accommodation of the Society. Other Courts being held here, the whole place received the appellation of Doctors' Commons. The original college was destroyed in the great fire in 1666. After the fire, until 1672, the Society held its Courts at Exeter House, in the Strand. In the year 1768 a royal charter was obtained by virtue of which the then members of the Society and their successors were incorporated under the name and title of "The College of Doctors of Law exercent in the Ecclesiastical and Admiralty Courts." The college consisted of a president (the Dean of Arches for the time being) and of those Doctors of Law who, "having regularly taken the degree in either of the Universities of Oxford and Cambridge and having been admitted advocates in pursuance of the rescript of the Archbishop of Canterbury, shall have been elected Fellows" in the manner prescribed by the charter. The judges of the Archiepiscopal Courts were always selected from this college. By Act of Parliament, 20 & 21 Vict. c. 77, sections 116 and 117, the college was empowered to

sell its real and personal estate and to surrender its charter to Her Majesty, and it was enacted that on such surrender the college should be dissolved and the property thereof belong to the then existing members as tenants in common for their own use and benefit. In pursuance of this enactment the college was dissolved and the whole of the buildings sold by public auction on November 28, 1862. The site of the college and the residences and gardens belonging to the twelve resident doctors have since been appropriated to the formation of Queen Victoria Street and the erection of the Civil Service Stores, the Post Office Savings Bank and the chief office of the British and Foreign Bible Society. The wills and documents from the old Prerogative Court, which adjoined the college, and has since been pulled down, were transferred to the Court of Probate Registry at Somerset House in 1874. The Ecclesiastical Courts are now open to all the members of the Bar of England generally, and the 39 & 40th Vict. c. 66, permits solicitors of the Supreme Court to appear as proctors in the Provincial Courts of Canterbury and York.

HOUSING OF THE POOR.

A CONFERENCE of municipal and county engineers was held in connection with the Sanitary Congress in Liverpool. Mr. A. M. Fowler, who presided, delivered the opening address, and referred to several questions which called for the serious consideration of all those whose duty it was to endeavour to improve the health and the sanitary condition of the people. These questions included:—(1) The housing of the poor and working classes; the improvement in the condition of the dwellings, and the development of facilities to meet this end; (2) the improvement in the surfaces of the streets and ground in towns; and (3) the water supply for domestic use. It would, he said, be futile to endeavour to mature a condition of hygiene in the absence of satisfactory dwellings being provided for the poor, because it was here where the initial stage of contagious diseases invariably germinated. The question of housing the poor had been discussed from time to time during the past eighteen years, and hundreds of thousands of pounds had been expended on what had been called the improved system of building blocks of artisans' dwellings, and he was free to admit that it was an improvement on the former state of

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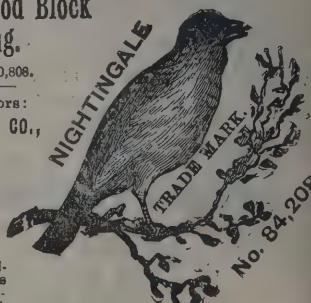
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things ; but, on the other hand, it was (in his opinion) as yet far from satisfactory. He had come to the conclusion that the back-to-back house self contained (as so extensively constructed at Leeds on the modern plan) was the best class of house for the working man. Next in importance to the construction and maintenance of cottage houses was the construction and cleanliness of the streets in large towns, and the quick removal of filth therefrom. The enormous saving could not be estimated by the construction of public roads in large towns with improved (almost noiseless) hard wood pavement or the improved asphalt, and by the constant removal of filth from the streets. The noise of traffic, by the adoption of wood pavement, was reduced to a minimum, and the deadening of sound to the occupants of buildings adjoining streets was conducive to the health of the nervous system, and enabled business to be transacted with ease and comfort. The preservation of horse-flesh, not only by reducing the friction in vehicles passing over the surface, but by the wear and tear of the vehicles, was enormous, and resulted in the vehicular traffic being considerably reduced. The accumulation of dust and dirt was also reduced. There was no doubt, as many medical men throughout the country had shown, that the floating particles in the atmosphere aggravated bronchitis and created lung diseases, as in manufactories by the dust of coal, sand, steel, cotton and hemp ; also from stone quarries where the workmen suffered by inhalation. But the suspended matters in the air in large towns, chiefly consisted of dust from refuse and organic matter, and imperfectly consumed particles of coal. He would refer to another sanitary matter, and that was the importance of a supply of soft water, especially to large towns. The benefits and economy arising therefrom in its various applications and use were enormous when the digits of account were added up and the total ascertained. The importance of securing a soft water for domestic purposes and for generating steam in boilers for motive power could not be over-estimated. The hardship of having to use hard water enforced upon the working classes was one of the most serious matters for correction for the attainment of health and cleanliness, inasmuch as it was evident to any observant mind that wherever excessively hard water was used, washing clothes were practically abandoned and dark clothes were substituted to save the trouble and expense of washing. The next important topic before the public was the purification of sewage before the effluent therefrom was allowed to discharge into rivers and streams. A great deal has been said of late—volumes of papers

read and lectures given on this subject—and at least twenty schemes were now before the public which showed that this object of purification could be attained. But when the cost of the works was analysed it was found next to impossible to carry most of them into practical use. The filtration of sewage to gain this end was looked to with some prospect of success, both through land where it was in many cases effectually done, and through artificial filter-beds ; in the latter iron in its various forms was brought to bear in solving the question. It was very dangerous to deviate from mother earth and abandon nature's purifier for artificial contrivances.

SANITARY PROGRESS.

ON Monday the annual Congress of the Sanitary Institute began in Liverpool. Sir Francis S. Powell, M.P., delivered the inaugural address. He said it was impossible to consider the subject of sanitary progress in the country without a sense of satisfaction, almost of triumph. The difficulties which hindered their progress diminished both in area and in gravity. Improvement in public health had justified both the cost and the labour expended. The Local Government Board had during the last twenty years sanctioned a capital expenditure, chiefly for sanitary purposes, of 53,021,334*l.* in urban and of 3,923,270*l.* in rural districts, while during the same period local Acts had authorised a further expenditure of 67,335,956*l.* Vital statistics abundantly proved the wisdom of such expenditure.

In speaking of general sanitation, the President said that administration rather than legislation now demanded the energies of the sanitary reformer. Domestic buildings in London might still be erected to the height of 80 feet, exclusive of two storeys in the roof, power being unfortunately reserved to the London County Council to sanction the construction of buildings even of more gigantic proportions. Air and light could not perform their life-giving functions at the base of those structures, still less within courts enclosed in them. It was not an exaggeration to say that the dwellings of our nation were being built in the course of the present half-century. The erection of new houses and the destruction of old were everywhere seen. They were erected under by-laws for the most part wise, and were maintained under regulations conducive to health. Errors of judgment hindered progress. Doubts were already expressed as to the system of huge con-

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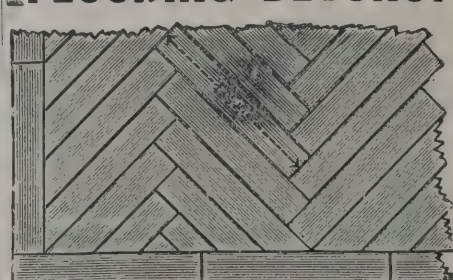
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Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
	Eliff Tower, Paris

Royal Military Exhibition, &c., &c., &c.
GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

structions under the name of artisans' or model dwellings. The Mansion House Council, no mean authority, described certain blocks of artisans' dwellings as a "difficulty which wants promptly dealing with." "These," said their committee, "have been erected without any regard to sufficient air and light around them." They added that "these places are haunts of dirt and immorality." In the cases of private dwellings and of model lodgings, the tenant had his duty to perform as well as the owner. Public authorities were helpless without the sanction of public opinion. Such opinion must be created by active agencies, by suasion, by personal visits. No paid official could wait and persuade as could the kindly visitor. We must place confidence in our schools. It was difficult to believe that children who passed long and pleasant hours in cleanly and well-ventilated schools would rest content with dirty and unwholesome dwellings. The factory and workshop not less than the dwelling were comprehended within the wide range of the sanitary province. The present Home Secretary administered with sympathy and full appreciation the statute passed by his predecessor. The employment, within wise limits, of female inspectors, especially as regards workrooms, would reveal many secrets and effect long-called-for reforms. Increased security against accident, improved appliances for ventilation and general conditions creating greater physical comfort during the hours of labour would increasingly improve the health of the artisan population. Health alone for the moment occupied their thoughts, but it could not be forgotten that the moral tone of the factory and workroom hands and their mode of life exerted influences upon health not less important than the conditions within the control of public authorities and of Parliament. It would not suffice to guard the workshop and the dwellings from injurious influences within. The health of the people could not be sound if the air were polluted. We must doubtless make sacrifices in order to conduct industrial processes. But the magnitude of those sacrifices must be diminished. We knew the common saying in reply to a complaint of nuisance arising from smoke, that "Smoke brings money." There was a new and better adage, "Smoke brings cost." The working classes might discover that the smoke which rendered cleanliness difficult and the brightness of a home impossible imposed upon them labour which was unnecessary and cost which might well be spared. The President proceeded to refer to the legislation dealing with processes dangerous to the health of workers, and went on to speak of river pollution. We could not hope by one effort in one generation to restore our streams to their

original purity. But we could do much. The Rivers Pollution Bill would be introduced in the next session. The Bill had been twice submitted to the House of Commons. He was not without hopes that Government would grant an inquiry by a select committee. Those who felt difficulties would thus have every opportunity of stating them, and Parliament would be better prepared to decide as to the concessions which ought to be made to the exigencies of manufacturers and the susceptibilities of some municipal authorities. The Government of the day might then undertake a task which appeared to exceed the opportunities of non-official members. The exhaustive report of the Royal Commission on the Metropolitan Water Supply claimed the fullest consideration. Let us wait no longer for new laws, but put into effect the laws already on the statute book. There might be some return of population to rural districts, but a vast proportion of our inhabitants must continue and probably in growing proportions to dwell in urban districts. We must, therefore, with all zeal bestow energy and knowledge on the improvement of our towns. To the attractions already dominant let there be added those of health and even of ornament. Towns had at their command efficient drainage, ample supply of water, prompt removal of refuse. They were acquiring by slow but sure degrees arrangements of their dwellings favourable to health. To the spacious parks must be added the open spaces protected from all cause of annoyance. Lord Meath's Public Garden Association could now claim between one and two thousand acres of open spaces as the result of their efforts within the Metropolis. What had been done in London must be possible elsewhere. He himself was full of hopes for the future. "Those hopes," he concluded, "will be in a large measure fulfilled if the advance of the next half century is equal to that made in the fifty years now counted among the past. I see on every side reasons for encouragement, none for holding back. There is everywhere fuller knowledge, riper experience, more sympathy from public opinion. Let us all press on in our great task, each a thoughtful and active worker in his own province. Our reward will be seen in every home which we purify, every family which we strengthen, every population which we elevate. None can foresee what struggles are at hand, what rude encounters are near, what severe competitions are to be met. It is our endeavour and our duty to prepare our nation for every trial, to give strength to bear hardship, vigour to conduct the contest, endurance to persist until the victory is gained."

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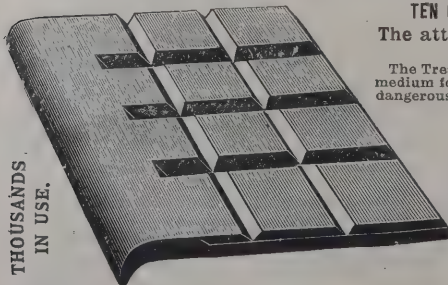
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VENTILATION OF THEATRES.

In a letter to the *Manchester Guardian*, Mr. Codling, engineer, says it is unfortunately true that nearly all our halls and theatres are so deficient in ventilation that it is impossible for them to be full for more than half an hour without the air becoming so highly charged with carbonic acid and organic effluvia from the lungs and the skin of the occupants that not only is headache, sore throat or weariness the inevitable consequence, but there is the further and greater danger of inhaling the seeds of disease from the micro-organisms that infest these polluted atmospheres. Air of standard purity contains four vols of carbonic acid per 10,000, and when the air of a room has more than seven vols of carbonic acid produced by respiration it is no longer fit for breathing, and no system of ventilation can be considered satisfactory which allows carbonic acid to approach this point. From numerous analyses that have been made of the composition of the air of theatres, halls and schools during occupation, it has been found that the carbonic acid often rises to over 35 vols per 10,000, or 28 vols per 10,000 beyond the limit at which air will continuously support life. Living in such a poisonous atmosphere as this, even for a short time, cannot fail to affect the vital functions and render us more susceptible to disease, and when inhaled for longer periods, as by children in ill-ventilated schools, numerous cases of lung disease are sure to be the result. The ventilating arrangements of many of our public buildings show plainly, from the very nature of the designs, that the authors were ignorant of the elementary principles that underlie the science. To insure that each person in a crowded building shall have a sufficient supply of air at a proper temperature, free from impurities and without draughts, requires the exercise of a great deal of skill and experience. It is impossible to obtain it by the method at present largely in vogue of providing inlets in the walls and outlet cowl at the top of the building, often without any regard to size and position, and trusting to the wind to supply the power for extraction, or natural ventilation, as it is called. Until it is recognised more than it is at present that this class of building can only be efficiently ventilated by mechanical means, i.e. by drawing or driving into the building air of sufficient quantity and at least as pure as the external atmosphere, it will be futile to expect any improvement in the atmosphere of these buildings during occupation.

A NEW ELECTRIC RAILWAY.

A WORK of unusual interest, says the *Standard*, has been begun on the Surrey side of the Thames, close to the west side of Blackfriars Bridge. There, emerging from the water, will be seen an extensive platform, similar to but longer than the one for several years in use at Swan Pier for the excavation of the tunnel under the Thames for the City and Southwark Electric Railway. That line was originally intended to be worked by cable, but the new line from Waterloo to the City is from the outset designed for electric traction. It has unbroken continuity of more than a mile and a half from the great terminus of the London and South-Western line—a length sufficient for the keenest competition with the omnibuses. It will deliver its passenger freights at the end of Queen Victoria Street, in the very heart of the City, and will thus make Waterloo Station more convenient than the London Bridge and Cannon Street Stations of the South-Eastern Company, and doubtless add value to the suburban regions of the South-Western Railway. The new line passes by an easy curve diagonally under the river, and this curve gives a starting impetus to the trains in either direction, which, combined with the electrical motive power, will enable a speed of twenty-two miles an hour to be attained. The locomotive trains of the Metropolitan Underground Railway do not work at more than eight miles. But these are not all the benefits which have been contemplated for the City passenger traffic. Great relief to the street traffic will be afforded by a most serviceable underground circular subway surrounding the great central underground station, with its booking-offices, lifts and passenger platforms. This will occupy all the space between the ends of Queen Victoria Street, the Poultry, Prince's and Threadneedle Streets, Cornhill and Lombard Street. Some time ago a central electric railway was projected to run from Shepherd's Bush, along and under Oxford Street, with a central station in front of the Mansion House, as a part of that scheme. For this, powers have been obtained, and the plans approved by the City of London Corporation. So that the further interest attaches to the new electric line of being the first to enter into the longest and most important underground central station of the busiest locality in the world. The circular subway will have its floor at 10 feet below the present surface, and will be itself 8 feet in height, there being 2 feet of roof above it. Access will be had to it by stairs at the angle-corner of Queen Victoria Street and



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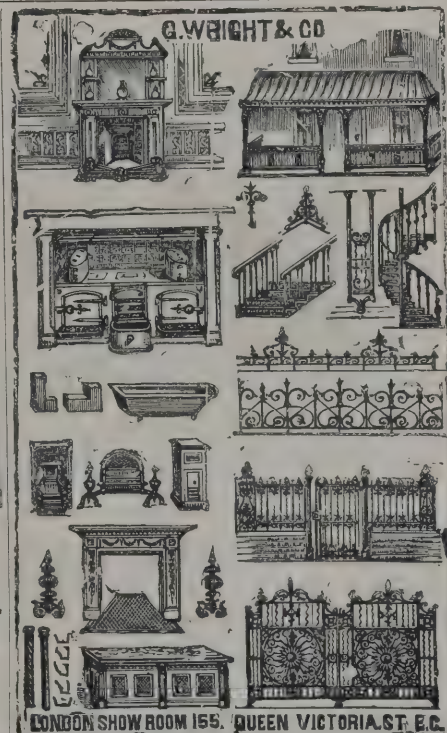
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the Poultry; at the angle of the Union Bank with Prince's Street; at the opposite corner of the Bank of England; in front of the Royal Exchange; at the angle of Cornhill with Lombard Street; at the side of the Mansion House in Walbrook; and at the angle of Walbrook with Queen Victoria Street. By it passengers can pass to or from any of those points without being exposed to the dangers of crossing the busy traffic or the surface above ground. These stairs have been planned in the slackways which vehicular traffic always leaves near the corners of the streets, so that they will not interfere with the horse-roads nor the footways. Under the passenger subway there will be a special subway for gas and water-pipes and electrical mains, so that there shall be, after its execution, no need for breaking up the surface paving.

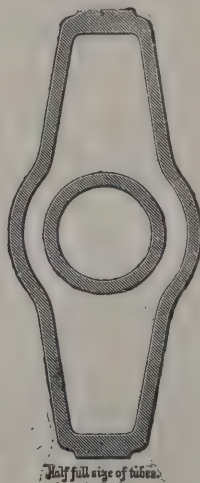
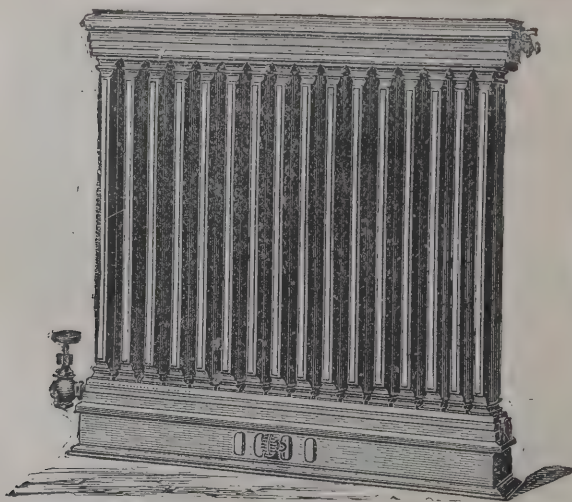
At the Waterloo end the arrangements are planned with special regard to the convenience of passengers arriving or departing by the trains of the South-Western Company. The Electric Railway will enter at the arches on which the terminus is built, and at right angles to the whole of the numerous arrival departure and suburban platforms, from each of which descent by stairs will give access to the platforms of the new railway. The electric line is being carried out by a special company, which is, however, fostered by the South-Western, and several of the directors of that company have seats on its board. The works are being carried on under the joint engineering control of Mr. Galbraith, of the South-Western, and Mr. Greathead, who designed and constructed the City of London and Southwark electric line. The principle of construction and the mode of execution will be the same as those so successfully carried out in that instance. The tunnels will be each formed of an iron ring or culvert, formed of segments bolted together by their flanges planed to smooth surfaces. Through small holes in the iron culvert cement will be blown, to form a skin on the exterior, whilst the inside will be concreted to form a smooth surface level with the inwardly projecting flanges of the segments. The diameter of the iron culvert will be 12 feet, increased to 12 feet 9 inches at the stations. The contract for the two parallel tunnels has been let to Messrs. Mowlem & Co., of Westminster, and the caissons which will form the means of access to the borings have already been sunk under the staging at Blackfriars Bridge to a depth of 50 feet. As soon as the depth of the floors of the intended tunnels (65 feet) is attained, the four protecting shields and the mechanical excavators will be lowered into position, and the driving of the tunnels will be carried on simultaneously in both directions. The method of

working will be the same as in the former instance of the City and Southwark. As soon as the first ring of the culvert is put together a shield is put in the front. Through a door in it the face of the heading is accessible to the miner, who picks out the central core of the rock. The shield has a projecting edge all round its periphery, which, as the shield is pushed forward by the hydraulic presses, cuts a circular hole sufficiently large for putting the iron segments together to the proper dimensions of the culvert. Wedges being inserted in the rock face between the periphery of the shield and the central core cavity, the intervening rock is broken into fragments and falls down between the shield and the face of the heading, being shovelled up thence and sent away to the rear in skips. Thus the progress will be made ring by ring, one at a time, each ring advancing the tunnel by 2 feet. The geological formation through which the tunnels will be excavated will be London clay for the entire distance, except at Stamford Street, where there will be a deposit of gravel to be pierced containing large volumes of water, which will be met by overpowering air-pressure, as at Stockwell on the Southwark line.

The particular method of working the line by electricity has not yet been determined, nor has the site of the generating station been fixed upon, but it will probably be at the Waterloo terminus. The success of the Overhead Electrical Railway at Liverpool must certainly give rise to a consideration of the important differences in working by electric locomotives as on the Southwark line, or by electric motors attached to the passenger carriages themselves. There will also have to be reviewed the question of short trains and short intervals, or long trains and long intervals, although the nature of the traffic arriving by railway main line trains and by suburban trains will be an essential factor in its determination on the Waterloo and City new line. In Liverpool two carriages are run as a train on the frequent system, these carriages each containing sixty passengers. A very important electrical consideration is, however, fundamentally involved, namely, the stress and loss of current in the starting of the heavy electric locomotives.

ADMIRALTY BUILDINGS.

EARLY in the new year, the *Daily News* says, it is hoped that the first block of the new Admiralty buildings overlooking the Horse Guards' Parade and St. James's Park will be ready for occupation. This new edifice is not to supersede the old



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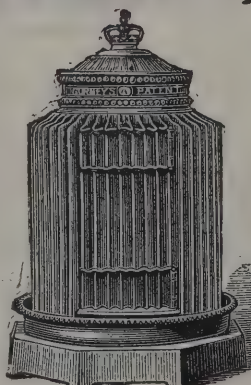
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Admiralty; it will be an extension of it. There are many who will think it unfortunate that it should be so. Ripley's building is not one that we can any of us be proud of, and Mr. John Taylor, London Surveyor of the Office of Works, told a Parliamentary committee in 1887 that it was then 135 years old, and would probably have to be pulled down and rebuilt at the end of another seventy-five years. It had at that time been decided to build an entirely new Admiralty and War Office, and Messrs. Leeming & Leeming, architects, of Halifax, had designed a very imposing and beautiful building which would have accommodated the headquarters of both services. But it was estimated to cost 700,000*l.*, in addition to 490,000*l.* which had already been spent in the purchase of a site. This was thought to be rather too large an order, and the matter was referred to the select committee already mentioned. This committee reported their opinion that, after all, the scheme should be abandoned. "We are satisfied," they said, "that by making additions to the present Admiralty all the requirements of that department may be suitably provided for; that this work, including some repairs and improvements to the existing building can be done at a moderate cost, and may be completed within two or at most three years, and that a very large reduction of expense would thus be secured." It was an excellent motive for a change of plans, a motive that all taxpayers can fully appreciate. But the effect of this report was to deprive Messrs. Leeming's plans of much that was really very fine, to leave the old Admiralty still to hide its ugly front from behind the stone screen—set up in front of it purposely to conceal its clumsy proportions—and, most unfortunate of all, to involve in all probability before the business is done with an outlay even greater than that which so staggered the Treasury ten or twelve years ago. When this is done, the War Office will still have to be provided for, and the present idea seems to be to erect a fine new building for that branch of the service on a very valuable site facing the Horse Guards and separated from the Admiralty only by the width of Whitehall.

However, the change in plans either for good or bad was decided upon, and the block now approaching completion is the partial embodiment of the alternative scheme finally adopted. It is a handsome piece of building, and well worthy of its fine position. It is of red brick and Portland stone, and when completed will have cost about 150,000*l.*, of which no less than 23,000*l.* has been spent on the foundations. This heavy expenditure has been rendered necessary by the nature of the soil, an interesting light upon which has just recently been

thrown by the discovery at the depth of 20 feet of what is believed to be an old river pier, showing that at one time the Thames extended over what is now the Parade Ground, and that boats no doubt formerly came up here. It is very well known that the present Admiralty has no better foundation than oak planking and sleepers laid in oozy mud, so that with some truth it has been said that the Admiralty floats as well as its ships. We have less reliance on British oak than we used to have, and the subsidence that has taken place in the old building has shown the desirability for a more trustworthy foundation for the new one. The contractors have got right down to the London clay, involving excavations at some points of about 30 feet, and upon the London clay they have built up in concrete what is in fact a huge tank 24 feet deep, 106 feet wide and 300 feet long, with a mass of concrete 6 feet deep for its bottom. In this tank the new building has been placed, thus giving it a splendid foundation, and most effectually precluding all risk of dampness as well as subsidence. From its concrete bottom the new edifice rises six storeys high, and the roof seems to be as noteworthy as the base. It is constructed of steel encased in fireproof material. The whole building, it need hardly be said, is fireproof and in its internal arrangement shows something of a new departure in Government establishments, many of which, including some of the more modern ones, are by no means up to the latest standard as regards considerations of health of those engaged in them and are very indifferently lighted, especially the corridors giving access to the various rooms within them. In this building special attention has been paid to both these points. In the centre of it is a court open from the basement to the sky, and round this the corridors run. The doors of the rooms—of which there are 120 for occupation and 50 to serve as official repositories—open from these corridors, the windows all looking outward all round the block. Across the middle of the central court tiers of lavatories are built so as to be quite out of the main building and entirely surrounded by the open air. The rooms will all be heated by open fireplaces, supplemented in the case of the principal ones on the first floor—to be occupied by the chief officers of the service—by warmed fresh air, distributed by steam-driven fans. In summer the air instead of being warmed, will be driven over a refrigerating apparatus.

This looks a little luxurious, but the building throughout, though thoroughly good and substantial, will be found to present little that can be described as extravagant. On the whole the internal fittings are plain. There is no sort of show



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apartment anywhere about it. There are on the first floor a number of reception-rooms, and on this same floor and on the same side of the building, that looking across the park, are the rooms allotted to the Naval Lords. The First Lord's apartment overlooks the Horse Guards' Parade. These will be nice rooms, but nothing very imposing. Indeed, a reasonable economy appears to have prevailed throughout. It was at one time determined to take one of the best rooms on the park side as the Admiralty board-room, instead of the one in which the affairs of the British Navy have been discussed and controlled ever since the Admiralty was built. This old board-room is a fine and interesting chamber, and it has direct association with all the most momentous and thrilling events of our modern naval history. A very natural sentiment appears to have prevailed against any change, and it now seems to be settled that the Admiralty Board shall meet round the old table in the old room.

The new block stands back to back with the existing old one, but with a considerable space between them. When the full design has been carried out, this new building will form the west side of a quadrangle, and the old building the east side. Along the north side of this quadrangle another new block will join the other two, and for this part of the work plans are now being got out. The connection between the existing Admiralty and the new block at their southern ends will be different. There will be a handsome elevated dome at each end of this southern façade when all is complete, and between these two domes—one of which is now rapidly approaching completion—a columnar stone screen will connect the new with the old building. This screen will also serve as a covered footway between the ground floor of the buildings, and beneath it a subway will afford internal communication. A knowledge of these features of the completed plans will lend significance to some of the work now in progress otherwise unintelligible. That this new Government establishment has long been sorely needed can hardly be doubted by anybody who has had occasion to penetrate the interior mazes of the present Admiralty. The original building has for many a long day been wholly inadequate to the service, and at least thirty neighbouring houses as well as a chapel of ease have been one by one annexed and incorporated. Doorways have been knocked between them, and bridges have spanned intervening streets and passages, and such a bewildering warren as has thus grown together can be found hardly anywhere else in London. A sum of 300,000*l.* will probably have been spent before all is

done, and not improbably a good deal more than that; but that it was a work really necessary can hardly be questioned, and the chances are that by the time it has been completed we shall begin to discover unanswerable reasons for making a clean sweep of the ugly old front in Whitehall and all that pertains to it, and bringing forward into the main thoroughfare a handsome and coherent whole, worthy of the British navy and the fine position the establishment occupies.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

17208. François Hubert Lenders, for "An improved composition forming a substitute for stone, marble, plaster and the like."

17221. Josef Rueben, for "Improvements in or relating to fireproof ceilings."

17238. John James Spear, for "An apparatus to stop the noise of the inrush of water to water-closet tanks."

17282. Joseph Hamblet, for "Improvements in kilns for burning bricks, tiles, drain-pipes and for other purposes."

17317. John James Hanbury, for "Improvements in pipe-couplings."

17366. Craven, Dunnill & Co., Limited, and Thomas Pitt, for "Improvements in apparatus for the manufacture of tiles."

17403. Brodie Cochran, for "Improvements in or relating to the manufacture of bricks."

17408. Joseph Victor Hibbert and Arnett Hibbert, for "A new process of protecting plaster-casts, and rendering them washable."

17467. James Fagan, for "Improvements in flushing cisterns for water-closets."

17571. Daniel Dimond White, for "Improvements in mechanism for ships' water-closets."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

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CONTRACTS OPEN.

ABERFAU.—Oct. 10.—For Building House and Alterations to Methodist Chapel. Mr. T. Roderick, Architect, Aberdare.

ABINGDON.—Oct. 9.—For the Erection of Twenty-four Artisans' Dwellings. Mr. J. G. T. West, M.S.A., The Knowl, Abingdon.

ALNWICK.—Oct. 11.—For Reseating Clayport Presbyterian Church. Mr. George Reavell, jun., Architect, Alnwick.

BALTINGLASS.—Oct. 6.—For Building Labourers' Cottages. Mr. R. Ralph Dagg, Clerk, The Workhouse.

BASFORD.—Oct. 22.—For Erection of Buildings for Infectious Diseases Hospital. Mr. Herbert Walker, Architect, Newcastle Chambers, Nottingham.

BATLEY CARR.—Oct. 5.—For Building Warehouse. Messrs. P. Spencer & Son, Architects, Batley Carr.

BIRKENHEAD.—Oct. 18.—For Building Fire Station. The Borough Engineer.

BLAENAVON.—House. Mr. E. Blewitt, Surveyor, Blaenavon.

BRIGHOUSE.—Oct. 15.—For Building Twenty-one Houses. Messrs Sharp & Waller, Architects, 18 Bradford Road, Brighouse.

CADOXTON.—Oct. 12.—For Additions to Board Schools. Mr. G. Thomas, Architect, Queen's Chambers, Cardiff.

CARDIFF.—Oct. 15.—Rustic Bridge, Roath Park. The Borough Engineer.

CARDIFF.—Oct. 31.—For Building Church. Mr. G. E. Halliday, Architect, 14 High Street, Cardiff.

DERBY.—Oct. 15.—For Enlargement of Board School. Mr. J. S. Story, Architect, Market Place, Derby.

DROGHEDA.—Oct. 20.—For Bank Premises. Mr. Walter G. Doolin, B.E., Architect, 20 Ely Place, Dublin.

DUBLIN.—Oct. 10.—For Labourers' Cottages, Howth. Mr. Atkinson, Clerk, Board of Guardians, North Brunswick Street, Dublin.

FRASERBURGH.—Oct. 10.—For Additions, Boyndlie House. Messrs. Ellis & Wilson, Architects, 181A Union Street, Aberdeen.

GRAFFHAM.—Oct. 5.—For Additions, &c., to Infant School. Mr. H. W. Grainge, Graffham, Petworth.

GILLINGHAM.—Oct. 10.—For the Erection of a Public Elementary School. Mr. E. S. Atchison, 8 Waterloo Road, New Brompton.

GREAT WESTERN RAILWAY.—Oct. 8.—For the Supply of Stores (Bricks, Tiles, &c.). Mr. G. K. Mills, Paddington Station.

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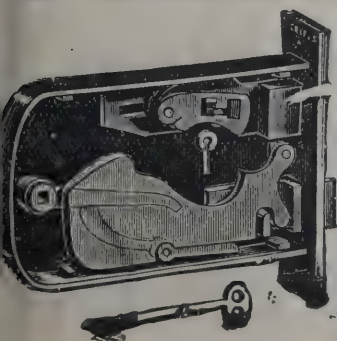
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KILLMALLOCK.—Oct. 14.—For Alterations to Steward's House, Mount Coote. Mr. E. A. Hackett, County Surveyor, Clonmel.

LEWISHAM.—Oct. 9.—For Kerbing, Tarpaving, Metalling and Channelling Work. Mr. Edwd. Wright, Board of Works Offices, Catford, S.E.

LONDON.—Oct. 10.—For Alterations and Additions to Heating Apparatus at Holborn Workhouse, City Road. Mr. A. Saxon Snell, F.R.I.B.A., 22 Southampton Buildings, W.C.

LONDON.—Oct. 15.—For the Erection of Second Portion of Enlargement of Post Office Savings Bank in Queen Victoria Street. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LONDON.—Oct. 15.—For Addition to the Patent Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

MANCHESTER.—For Clothing Factory, &c. Mr. Henry A. Cheers, Architect, Twickenham, London, W.

NEW BARNET.—Oct. 15.—For Residence. Mr. E. Ferguson Taylor, Architect, Station Road, New Barnet.

NEW ROSS.—Oct. 30.—For Parish Church. Mr. Walter G. Doolin, B.E., Architect, 20 Ely Place, Dublin.

PONTYPRIDD.—Oct. 8.—For Building Church. Mr. G. E. Halliday, Architect, 14 High Street, Cardiff.

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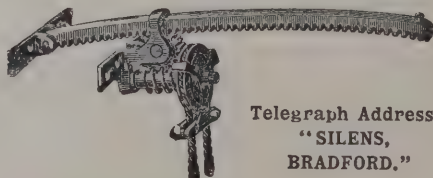
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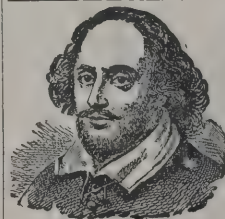
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C. G. Fowler	98	0	0
W. Dudley	75	0	0
W. PETTS (accepted)	75	0	0
G. Sherwin	44	10	0

GWAUN-CAE-GURWEN.

For Alteration and Extension of the Gwaun-cae-Gurwen Board School, for the Llanguicke School Board.

Williams & Morgan, Cwmtwrch, Swansea Valley	£1,300	0	0
E. Thomas, Seven Sisters, Meath	1,220	0	0
Amman Valley Sawmills Co.	1,202	9	0
D. Rees, Ystalyfera, Swansea Valley	1,195	0	0
S. Jenkins, Gwaun-cae-Gurwen	1,060	0	0
J. WILLIAMS, Gwaun-cae-Gurwen, R.S.O. (accepted)	1,050	0	0

GELLIGAER.

For Extension to the Tirphil Board School, for the Gelligaer School Board. Mr. JOHN WILLIAMS, Architect, Morgantown, Merthyr Tydfil.

T. Williams, Bargoed	£1,050	0	0
W. Williams & Son, New Tredegar.	1,330	0	0

HORSLYDOWN.

For Erection and Completion of an Addition to the Anchor Brewery, Horslydown, for Messrs. Courage & Co., Limited. Messrs. INSKIPP & MACKENZIE, Architects. Quantities by Messrs. R. L. CURTIS & SONS.

B. E. Nightingale	£17,850	0	0
Munday & Sons	17,479	0	0
Kirk & Randall	17,000	0	0
E. Lawrence & Sons	16,500	0	0
Howell J. Williams	15,987	0	0
W. Watson	15,524	0	0

LLANDEBIE.

For Building Six Workmen's Dwellings at Penygroes, for Mr. William Williams, Schoolmaster. Mr. DAVID JENKINS, F.R.I.B.A., Architect, Llandilo.

L. Davies	£1,207	0	0
J. Davies	1,135	0	0
D. Jones	1,080	0	0
P. Evans	930	0	0
D. Evans	855	0	0
Davies & Jones	840	0	0
D. H. JONES, Llandilo (accepted)	800	0	0

LONDON.

For New Building on Site of Nos. 20 and 22 Hanbury Street, Spitalfields, E., and Buildings in Rear. Mr. ALFRED CONDER, F.R.I.B.A., Architect, Palace Chambers, Westminster. Quantities by Mr. EDWARD J. PAINE, F.S.I., 11 Great James Street, W.C.

James Chapman	£2,679	0	0
J. Chessum & Sons	2,547	0	0
Thos. Knight	2,529	0	0
McCormick & Sons	2,482	0	0
H. L. Holloway	2,339	0	0
Stimpson & Co.	2,334	0	0
John Greenwood	2,263	0	0
GEO. F. BRADY (accepted)	2,200	0	0

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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For Building Block of Warehouses, High Street, Stratford, for Messrs. A. T. Morse & Co. Messrs. J. T. NEWMAN & JACQUES, Architects, 2 Fen Court, E.C.	
J. H. Newman	£5,546 0 0
White & Son	5,186 0 0
J. Catley	5,150 0 0
T. H. Craig	4,999 0 0
Sabey & Son	4,900 0 0
Howlett & Co.	4,890 0 0
Calnan & Co.	4,830 0 0
Hearle & Farrow	4,800 0 0
Bishop & Webb	4,790 0 0
F. J. Coxhead	4,770 0 0
W. J. Maddison	4,717 0 0
S. J. Scott	4,675 0 0
B. E. Nightingale	4,669 0 0
Kirk & Randall	4,649 0 0
Reed & Son	4,640 0 0
F. & H. F. Higgs	4,632 0 0
S. & W. Pattison	4,538 0 0
W. Fortescue	4,498 0 0
G. Sharpe	4,445 0 0
Gregar & Son	4,444 0 0
BATTLE, SONS & HOLNESS (accepted)	4,439 0 0

NEW MALDEN.

For Alterations and Additions to Premises, New Malden. Mr. T. V. HERBERT DAVISON, Architect.	
Glass	£250 0 0
A. Collis	183 0 0
J. SAUNDERS, New Malden (accepted)	127 0 0

NEW TREDEGAR.

For Building Mission-room, Elliotown, New Tredegar. Messrs. AARON DAVIES & SON, Architects, Pontlottyn.	
W. WILLIAMS & SON, New Tredegar (accepted)	£599 0 0

PEMBROKE.

For Additions to East End Schools, for the Pembroke School Board. Mr. JOHN E. P. LADD, Architect.	
Thomas & Hay	£670 2 0
C. Young	577 10 0
DAVIS & MORGAN (accepted)	486 0 0

PERTH.

For Causewaying New Street between High Street and Mill Street, Perth, for the Police Commissioners.	
J. Melloy, Perth	£826 16 2
W. Anderson, Dundee	761 16 2
A. Stark & Sons, Kilsyth	725 12 0
A. Gall, Alloa	723 17 4
P. Irvine, Cherrybank	721 9 4
G. & R. Cousin, Alloa	699 12 4
L. & W. McDonald, Inverkeithing	655 0 0
D. & R. Taylor, Perth	594 7 4
A. BRUNTON & SON, Inverkeithing (accepted)	571 8 4

PONTYPRIDD.

For Lock-up Shops in Market Yard, for the Pontypridd Markets, Fairs and Town Hall Company. Mr. A. O. EVANS, Architect, Pontypridd.	
Williams & James, Trallwn	£300 0 0
M. Julian, Pontypridd	279 0 0
W. WILLIAMS, Coedpenmain (accepted)	249 0 0

PORTH (WALES).

For Building Fifty-two Cottages on Tynwydd Estate, Porth, for the Tynwydd Building Club, Porth, Rhondda Valley.	
Pearson, Cardiff	£172 0 0
C. Jenkins & Sons, Porth	(per house) 157 0 0
E. GEORGE, Porth (accepted)	(per cottage) 151 0 0

SANDY.

For New Store-rooms, &c., at Sandy. Mr. E. TWELVETREES, Architect, Sandy, Beds.	
French & Co.	£135 0 0
Cope & Co.	112 10 0
R. A. HENDRY (accepted)	108 10 0
For Erection of a Pair of Villas, at Sandy, Beds. Mr. E. TWELVETREES, Architect, Sandy, Beds.	
R. A. Hendry	£607 10 0
French & Co.	576 0 0
Cope & Co.	576 0 0
Coleman	575 0 0
Fathers	523 0 0
RAINSFORD BROS. (accepted)	517 0 0

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For Building Board Schools, Saxmundham.

G. O. Knowles, Aldeburgh	£2,052	0	0
Cutting & Sons, Saxmundham	1,894	0	0
R. Leggett, Middleton	1,804	6	6
W. G. Gibbs & Son, Saxmundham	1,800	0	0
G. Barrell, Woodbridge	1,732	0	0
W. J. Smith, Woodbridge	1,720	0	0
CARTER & SON, Saxmundham (accepted)	1,565	0	0

SOUTHPORT.

For 1,500 Yards of Cast-iron Socket and Faucet-jointed Rain-water Pipes, 4-inch Bore. Mr. W. CRABTREE, Borough Surveyor.

Steel Pipe Co. (Steel Pipes)	£417	0	0
Grosmith & Co.	114	11	8
T. W. Robinson	87	0	0
R. G. Brook	87	0	0
Shaw & M'Innes	85	0	0
S. Halton	84	11	8
G. L. Hodge	80	19	6
Callendar Iron Co.	80	11	5
Pryke & Palmer	78	6	8
Griffiths & Co.	77	18	6
Newton, Chambers & Co.	76	0	0
J. Ball	76	0	0
Seddon & Blundell	75	3	6
H. J. Skelton & Co.	74	17	2
J. C. MORRIS (accepted)	72	12	0

STAPLEFORD.

For New Billiard and Club Room, for the Stapleford Co-operative Society, Limited. Mr. ERNEST RIDGWAY, Architect.

Bastable	£699	0	0
F. Martin	693	0	0
J. Bull, Long Eaton	680	0	0
I. MARTIN (accepted)	678	15	0
Pacey & Henson	635	0	0
Moult	621	0	0

STOCKPORT.

For Painting Covered Market, Stockport. Mr. JOHN ATKINSON, Borough Surveyor.

Fantom Bros., Stockport	£158	0	0
Ashton & Townsend, Stockport	120	0	0
SEVER & LEACH, Stockport (accepted)	90	0	0

ST. ALBANS.

For Rebuilding Premises, High Street, St. Albans, for Messrs. Fisk & Son.

G. & J. Waterman	£3,995	0	0
C. Miskin	3,796	0	0
W. G. Dunham	3,651	0	0
Palmer & Fotheringham	3,641	0	0
Norris	3,490	0	0
T. Toms	3,386	0	0
J. & W. Savage	3,374	0	0
T. TURNER, Limited (accepted)	3,248	0	0

ST. MARGARETS.

For Building Two Houses. Mr. P. L. RACER, Architect, Brackley Terrace, Chiswick.

Emmett	£596	13	0
Morgan	530	0	0
Arnold	517	10	0
Snell	497	0	0
Wilcox	464	0	0
A. Collis	461	0	0
COLLIS (revised and accepted)	402	3	2

STOURBRIDGE.

For Supply of Cast-iron Manhole and Lamphole Covers, with Galvanised Iron Dirt-buckets and Fittings, for the Upper Stour Valley Main Sewerage Board. Messrs. E. B. MARTIN, and W. FIDDIAN, Joint Engineers.

Harper & Sons, Dudley	£753	5	9
J. Brooks, Lye	752	0	11
G. Waller & Co., Southwark, S.E.	734	5	6
Penn Bros., Cradley Heath	727	14	6
Hunt Bros., Oldbury	680	8	6
J. Wheeler & Sons, Langley	653	2	10
Hill & Sons, Wolverhampton	633	9	0
H. Ball, Kidderminster	586	15	0
Higgins Bros., Lye	564	3	6
D. Parsons & Sons, Pensnett	505	5	6
M. & W. GRAZEBROOK, Netherton (accepted)	486	13	3

SUDBURY.

For Making Drain, Long Melford, for the Sudbury Union Rural Sanitary Authority.

Downs & Stephenson, Hadleigh	£55	10	0
H. Green, Long Melford	65	10	0
D. H. Porter, London	38	15	0
T. CLEMENT, Long Melford (accepted)	36	10	0

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TRADE NOTES.

SOME large new stables are just being completed for Sir Peter Walker, Bart, at Osmaston Manor, Derbyshire, and the large clock has been erected by John Smith & Sons, Midland Clock Works, Derby.

As a tribute to the memory of the late Rev. George London, the teachers and scholars of St. George's Schools, Altrincham, have placed a very handsome font in the church, designed and executed by Messrs. J. & H. Patteson, Oxford Street, Manchester. The font is of octagonal form, in rich Derbyshire alabaster. The massive basin is supported by a column of rich red Devonshire marble with carved capitals, and the whole rests upon an octagonal base. On four sides are carved the sacred monogram "I.H.S.," the sacred cross, three fishes representing the Trinity, and the Pascal Lamb. Round the base of the font in gold letters is the following inscription:—"Erected in loving memory of the Rev. George London, for thirty-three years vicar of this parish, by the teachers and scholars of St. George's Schools, 1894." This, together with the beautiful window placed in the north aisle, forms a very appropriate memorial of the late vicar.

THE extensions to the Royal Hospital, Richmond, Surrey, are now nearing completion. A new children's ward, called the "Princess May Ward," has been added, which is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, supplied by Messrs. E. H. Shorland & Brother, of Manchester. The architect is Mr. Frank J. Brewer, of Richmond.

ELECTRICAL.

THE committee of the Hertford Corporation have decided to make application to the Local Government Board for a loan of 6,000*l.* for carrying out the electric-lighting scheme—700*l.* for the land and 5,300*l.* for the necessary plant, &c.

THE electric-lighting committee of St. Helen's Corporation have had under consideration the question of electric lighting in the borough, and the town clerk was instructed to arrange terms with Mr. Robert Hammond, London, for a report as to the adoption of a scheme for the supply of electricity. Mr. Hammond agreed to make a report for the fee of 50 guineas, such fee, in the event of his being engaged as engineer for the carrying out of the scheme, to merge into his commission on the cost of the work.

IT is reported that there is now every prospect of the scheme for the construction of an electric railway to the summit of Snowdon being carried out in a short time. The services of Mr. Duncan Fox, engineer, have been commissioned, and his plans will probably be framed on the lines of those adopted for similar railways on the Continent.

COUNCILLOR MEADE-KING, a member of the Liverpool Corporation, having suggested that the electric light should be substituted for gas at St. George's Hall and the Municipal Buildings, the finance sub-committee considered the matter, and have recommended that, in view of the great improvements constantly being made in the electric light, it was not desirable to incur any large expenditure on the electric light at present.

VARIETIES.

AN exhibition is announced to be opened in November at the Royal Aquarium, Westminster, under the direction of an honorary committee, consisting of Joseph T. Clarke, G. R. Halkett, Ernest Hart, M.D., A. S. Hartrick, F. G. Prange, L. Ravenhill, Gleeson White, Victor Champier and F. G. Dumas. Examples of the following English artists will be exhibited:—H. Herkomer, R.A., Walter Crane, Dudley Hardy, Aubrey Beardsley, "Pal," Cleaver, Maltby, Steer, the Brothers Beggarstaff, Halls, Brangwyn, Mortimer Menpes and Furness, &c., whilst the French School will be represented by Cheret, Grasset, Lautrec, Steinlen, Willette, Grevin, Forain, Boutet de Monvel, Guillaume, Metivet, Van Beers and Bonnard. An illustrated catalogue in colours is in preparation, edited by Edward Bella.

WE have much pleasure in drawing attention to the new private post-cards, with "Sketches of Familiar London," by Mr. W. Hanson. The blocks have been produced, and the cards are printed and published by Messrs. Beechings, Limited, 174 Strand, W.C. This is the first attempt in England to introduce the illustrated post-card so usual on the Continent. The engravings submitted to us show the Houses of Parliament, Westminster Abbey, St. Paul's Cathedral, the new Tower Bridge over the Thames and the Tower of London. The price per dozen is only 4*s. 6d.*

AT Hereford a Local Government inquiry has been held in reference to an application by the Town Council for powers to borrow 3,800*l.* for improving the waterworks, and 300*l.* for work in connection with gas mains.



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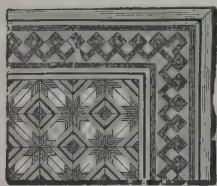
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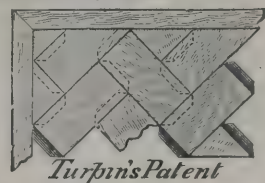
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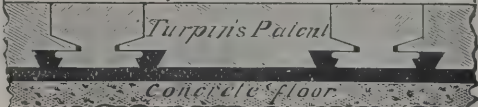
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Turpin's Patent

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AT the meeting of the Perth Dean of Guild Court, Bailie Kyd drew attention to the responsibility which was laid on the magistrates presiding at the Dean of Guild Courts by the new Police Act, and also to the number of plans which were brought before them got up in a rough sort of way, and not properly made out, which caused many adjournments to be made and continual annoyance before they were put right. He suggested that people wishing alterations made or new dwellings erected should get professional men to make out their plans, instead of the crude ideas of joiners and blacksmiths.

THE fine printing works of Alderman Cooke, in Hunslet Leeds, have been destroyed by fire. The damage altogether is estimated at 130,000*l*. This is partly covered by insurance.

THE large stores of the Somerset Trading Company at West Bay, Bridport, have also been destroyed by fire. The flames spread to adjacent premises, and before they could be checked the post-office and several houses and stores were gutted.

THE directors of the Longton Theatre Company have decided to proceed with the re-erection of the Queen's Theatre, which was destroyed by fire last week, and steps will be taken to push on with the work as speedily as possible.

AT the meeting of the Spalding Waterworks Company, it was announced that a new bore-well had been successfully sunk at Bourne. The bore was driven a depth of 134 feet, and would yield a supply of 2,592,000 gallons of water a day, at a pressure of 10 lbs. to the square inch. The water is of first-class quality, and it is proposed by the board to lay new mains from Spalding to Bourne in order to make the supply available. It was stated that this was the largest yield of water of any bore-well in England.

THE Neath Corporation have acquired possession of the Neath Waterworks at a cost of 46,000*l*.

COLONEL DUCAT, R.E., has held an inquiry at Brighton on behalf of the Local Government Board in reference to the application for power to borrow 14,900*l*. for the erection of a refuse destructor and cement stores. There was no opposition.

A FIRE-STATION is to be established at the riverside, Battersea, by the County Council. A building is to be erected for the accommodation of the staff near the southern end of the bridge at a cost of about 6,000*l*.

IT was announced from Antwerp that Great Britain, including colonies, was represented in the Exhibition by 271

exhibitors, who had gained 21 grand prizes, 42 diplomas of honour, 105 gold, 79 silver, and 46 bronze medals.

A FOSSIL tree has been discovered in a clay and shale pit at Sparth Bottoms, Rochdale. It is a fine specimen of sigillaria, 7 feet in height and 6 feet in girth at the base. The clay pit has often yielded smaller fossils.

SIR GEORGE BRUCE, C.E., the arbitrator, has decided upon 7*½**d*. as the price per 1,000 gallons to be paid to Cheltenham by Tewkesbury for the supply of water.

AWARDS AT THE HEALTH EXHIBITION.

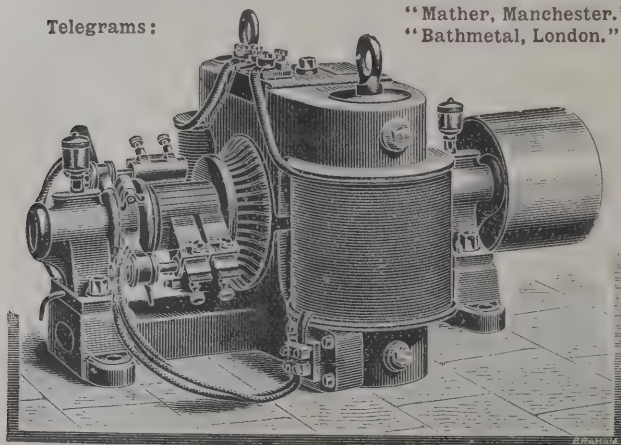
AMONG the awards given at the exhibition in connection with the meeting of the Sanitary Congress, held in Liverpool, are the following:—Messrs. Doulton & Co., of Lambeth—the only medal for connecting pottery to lead—for their "Metallo-Keramic" joint, which we noticed in our columns some time since. The award fully confirms the favourable view we then expressed as to its merits; and the Albion Clay Company, Burton-on-Trent.

Medals.—Blackman Ventilating Company, London, electric, steam and water ventilating fans; Crossley Brothers, Limited, Manchester, small high-speed gas engine; B. R. Isaac, Liverpool, Newman's Hose Company; George Jennings, London, century syphonic closet; Peace & Norquay, Manchester, improved folding partition.

Certificates.—Billington Bros., Liverpool, for hospital beds. William G. Black, Edinburgh, for Aitken's apparatus for ascertaining the number of dust particles present in the atmosphere. Thos. Bradford & Co., Salford, for vowel Y washing and wringing machine. "Perfection washdown closet." Eagle Range and Foundry Company, Birmingham, "Eagle" grate. J. Gibbs & Son, Liverpool, improved ventilating inlet, with large removable outside grating. B. R. Isaac, Liverpool, Albion safety lamp; Morris instantaneous hose coupling. George Jennings, London, porcelain radial urinal, with stall and base in one piece. John Jones, Chelsea, London, smoke machine, and smoke bag stopper for drain testing. C. Kite & Co., London, lock valve ventilator. Shanks & Co., Barhead, Glasgow, Shanks's combination closet, with cistern immediately behind. J. Tylor & Sons, Limited, London, E.C., "Ariston" valve closet; "Column" closet and slop sink combined; and "Column" waste-preventing system (McCormack's patent).

Telegrams:

"Mather, Manchester."
"Bathmetal, London."



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ELECTRICAL ENGINEERING DEPARTMENT.

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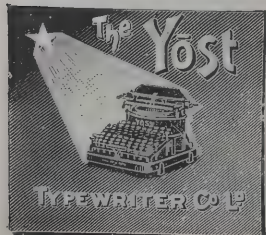
London Office: 16 VICTORIA ST., WESTMINSTER.

OVER ONE HUNDRED PER CENT. PER ANNUM.

An investment bringing in such a return in these dull days is worthy of attention. In a letter to the YOST TYPEWRITER COMPANY, of date April 4 last, Messrs. PRICE BROS., of Dudley, wrote:—

"As to the objection of first cost, all we have to say is that we saved the cost of our Machine in less than twelve months."

T TRADE MARK



The Machine referred to as such an excellent investment was a YOST Typewriter. The YOST will yield you the same return that it has brought to Messrs. PRICE BROS.

Full particulars from

THE YOST TYPEWRITER CO., LTD.,

40 HOLBORN VIADUCT, LONDON, E.C.

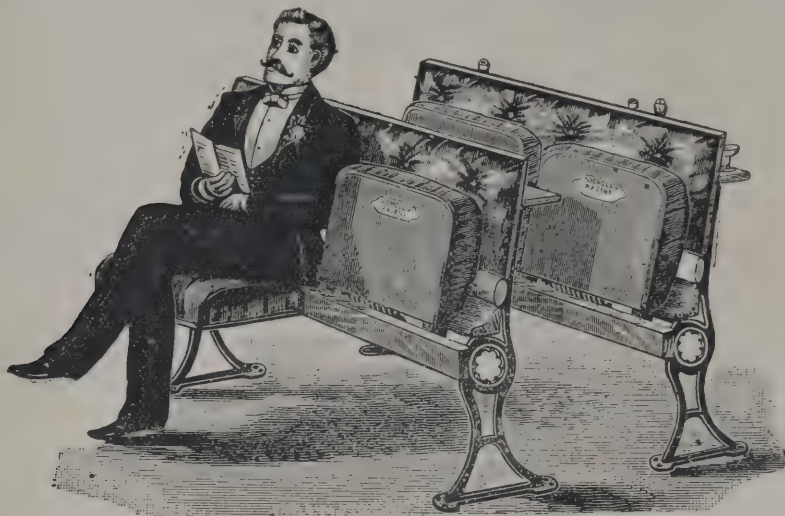
MANCHESTER: 3 Deansgate. LEEDS: 21 New Station Street. BELFAST: 9 Rosemary Street. BIRMINGHAM: 73 Temple Row. GLASGOW: 211 St. Vincent Street. PARIS: 36 Boulevard des Italiens. LIVERPOOL: 7a Lord Street.

NOTES ON NOVELTIES.

THE latest improvement in stall seats for theatres, music-halls, &c., consists of an ingenious automatic arrangement by which the seat closes on the occupant rising, and simply requires to be pulled down for further use. The illustration below gives a clear idea of its advantages. It will be seen that not only does this principle more effectually reserve a seat, but that it also occupies much less space, for there is only one iron standard to every seat, thus dispensing with half the usual quantity. The seats are also much easier of access, and one can walk comfortably in and out. The rows can go several inches closer

Nicholls & Co. have also patented an improvement in turn-up seats, to admit of the arms and backs of seats being turned up, the object in view being to occupy less space when grouped.

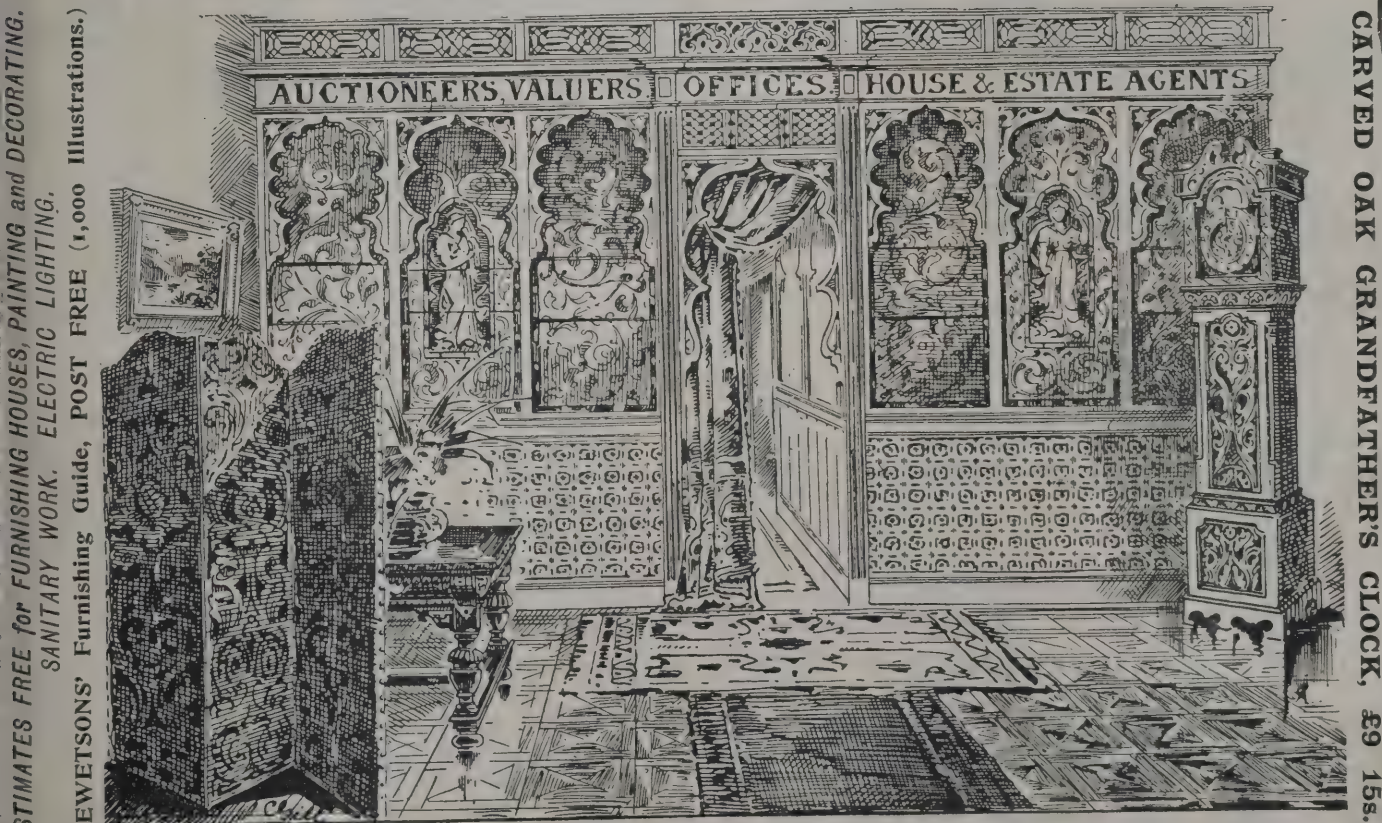
WE have received from Messrs. Christopher Baker & Sons, Limited, of 3 Broad Street Corner, Birmingham, an illustrated sheet of "Baker's curved and straight casement-stay and fastener combined." The advantages of the specialities are numerous, and only require a trial to prove their utility. Among other meritorious points they possess are protection against sudden gusts of wind straining the sash and endangering the glazing, the sash being firmly held in the centre when



together than in the ordinary way, a great consideration where economy of space is desired. The patentees and manufacturers of these automatic shut-up seats are Messrs. Nicholls & Co., of 45 (and 47 Endell Street, London, W.C., and we have no doubt that in a short time their patent will be generally adopted, and replace the old-fashioned seats now in use. Messrs. Nicholls & Co. have already placed them in the following:—Oxford Music Hall, Middlesex Music Hall, Bijou Theatre, Douglas, Isle of Man, &c. The same principle might be safely adopted in restaurants, billiard-rooms, &c. Messrs.

open, instead of, as usual, at the bottom; no movable screws or parts to get out of order, and strong section preventing their getting out of shape, which is a common fault with other stays, especially of the cheaper kinds; good appearance and half the usual fixing; less trouble to open and close the window; a great saving in cost, one article only to buy and fix; out of the way of young children; cheaper and more durable; sashes do not get banged to as in shutting with the bottom stays; will suit windows opening inwards or outwards; will suit all French casement windows. The straight pat-

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HEWETSONS' NEW ESTATE AGENCY OFFICES—For the Disposal and Rental of Houses and Property in Town and Country—Furnished or Unfurnished.
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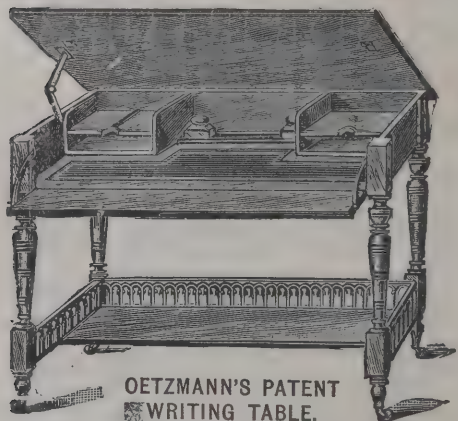
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CARVED OAK GRANDFATHER'S CLOCK, £9 15s.

tern does not require to be "handed," and it is especially suitable for top lights of bay windows, &c., where the sashes open outwards, hinged at the top or side. There is no danger of the window being imperfectly stayed, as the bar falls if not hooked properly, and they are out of the way of blinds.

"Simplex" Window-sash Fittings.—The "Simplex" Sash Company, of 86 Caroline Street, Birmingham, have introduced in the way of sash fittings what is very praiseworthy and yet simple. In the case of ordinary windows, the work is too often defective, though much good work is turned out here and there, but the best of work is liable to go wrong at times. The "Simplex" fittings practically get over such difficulties as arise from good work going wrong by reason of wear and tear. The price is lower than other methods of hanging sashes, and they can be hung in half the time. There is perfect simplicity of action. Both sides of window-panes can be cleaned inside the apartment, thereby obviating any risk of loss of life. The sashes can be stopped and fastened at any height desired, and the fastener is in easy reach on side of frame. No straining required to reach the sash-fastener, which is placed on meeting rails. It can be raised or lowered with the slightest pressure. The top sash may be lowered for ventilation by simply raising the bottom sash, the inside lining preventing bottom draught, and perfect ventilation is secured with the sashes securely locked. There are no cords to break or wear out, and no sash-weights or axle pulleys. No pulley-boxes or deep inside linings are required, only a $\frac{1}{2}$ -inch board for pulley style. There is also a saving in light and space in bay windows. Both sashes can be entirely removed from the frame in three minutes, for glazing or getting furniture in or out of room. No professional window-cleaner is required, as both sashes can be cleaned from the inside, and there is freedom from the objectionable rattle and draughts so prevalent with the present badly-secured frames. Existing sashes can be fitted at small cost.

A PUBLIC clock has been erected in the tower of the parish church of Wilsden, West Bradford, Yorkshire, by Messrs. Wm. Potts & Sons, clock manufacturers of Leeds and Newcastle-on-Tyne. They have fixed a large turret clock, striking the hours upon the fine bell in the tower, and showing the time upon four external dials. This busy manufacturing village, situated between the market towns of Bradford and Keighley, has hitherto not had a public clock.



OETZMANN'S PATENT
WRITING TABLE.

When closed forms an ordinary occasional table. Can be closed and locked with one action, and can only be opened with a key.

In solid walnut and lined with cloth, £2 18s. 6d.

BANK PREMISES, COVENTRY.

THE old banking premises belonging to the London and Midland Bank (and formerly the Coventry Union Banking Company), situated at the corner of High Street and Little Park Street, Coventry, have been pulled down, and new premises are now in the course of erection by Mr. Charles Haywood, jun., Coventry, from the designs of Mr. Frank Barlow Osborn, architect, Birmingham, for the London and Midland Bank, Coventry branch. The new buildings, which will be in the Elizabethan style of architecture, will comprise in addition to the banking premises a suite of let-off offices, situated on the ground-floor in Little Park Street, and a bank manager's residence on the first and upper floors. The banking-room, which will be 40 feet long and 34 feet wide, is arranged to accommodate twenty-six clerks, and will be approached from a vestibule at the corner of the two thoroughfares. The internal fittings will be constructed in polished walnut, and the bank counter, which will be 32 feet long, is arranged to accommodate five cashiers. The manager's office will face High Street and will be so arranged as to afford easy access to the vestibule, to the banking clerks and to the private speaking-box. The strong rooms, which are very spacious and secure, are situated in the basement, a hydraulic lift being provided, communicating with the banking-room over. The remaining portion of the basement will be appropriated to the use of store-rooms, lavatory, heating-chamber, &c., the whole being executed in a thoroughly fire and thief-resisting manner. The buildings, which will be executed in white Hollington stone, red bricks and roofed with tiles, is now being rapidly proceeded with, and it is expected will be completed by August next. The temporary offices of the bank are at 61 Hertford Street.

A GREAT display of chrysanthemums will be given on Wednesday, Thursday and Friday this month, October 10, 11 and 12, when the first show of the season of the National Chrysanthemum Society will take place at the Royal Aquarium, Westminster. Very fine novelties in Japanese chrysanthemums are promised, and prominent features of the miscellaneous class will be floral decorations formed of chrysanthemums. Exhibits of fruit, &c., of a high order of merit will add to the attractions of the show. There will be no extra charge. The variety entertainment on the great central stage will be strengthened by the renowned "Morritt," who promises a startling novel illusion, entitled "The Convict's Escape."

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180 QUEEN'S GATE, KENSINGTON.

179 QUEEN'S GATE, KENSINGTON.

180 AND 191 QUEEN'S GATE, KENSINGTON.

NEW CATALOGUES.

AN illustrated sanitary list has been issued by the General Iron Foundry Co., Limited, of 43 Upper Thames Street. The catalogue deals with lavatories, closets, baths, sinks, manhole doors, soil-pipes and connections, &c. Among twenty lavatory stands, many handsome designs (registered) are included. The effective appearance of these articles with the beautiful tilework and mirrors is well known, and the excellent fittings are all in character with the rest of the work. Lavatory ranges are shown, ornamental and others of plainer but useful kinds. Among the baths are the "Royal Sovereign" and the "Elm-bank," both of which are patented. In design they are quite out of the common. Notwithstanding the very ornamental character the prices seem very moderate. The decorated baths "Mikado" and "Flora" are prettily designed, one with Japanese work, while the other has a floral treatment. A large variety of closets are also illustrated, and among these is the "County Council" closet, a washdown with a special joint designed to meet requirements of sanitary authorities. We have only indicated a few of the appliances the catalogue refers to.

We have received a new illustrated list of the patents and specialties of Mr. James Gibbons, St. John's Works, Church Lane, Wolverhampton, lock manufacturer, general brass-founder and maker of all kinds of builders' ironmongery. Among the well-known Gibbons patents are the "anti-friction" mortise lock, "Dawkins's" museum bolt, espagnolette bolt, fanlight centres, improved lock for workmen's dwellings, improved patent "roller" axle pulley, mortise night latch, rim night latch, "roller" axle pulley, sash-lock, improved patent top and bottom sash-fasteners and lifts. An inspection of the illustrations will give a very good idea of the excellence of these specialties. Architects and builders will find it useful to have the catalogue by them for reference, as there are so many improvements in every direction that it is not possible to find space to describe them. The index of contents alone occupies

six columns. In addition a most valuable feature is the providing also of a numerical index, which is handy for those who consult the catalogue. Mr. Gibbons has long worked for all the well-known architects, and to call our readers' attention to his new catalogue is quite sufficient. The London offices and showrooms are at 9 Southampton Row, Holborn, W.C., under the management of Mr. T. Jones, the London representative.

PITCH PINE.

MESSRS. C. J. WADE & CO., timber merchants and importers, of 8 and 9 Great St. Helens, E.C., have received a large parcel of pitch pine, now piled away in the railway sheds, out of the ss. *Hazel Branch*, in the Surrey Commercial Docks, which has been deservedly recognised as one of the finest cargoes of this class of wood seen in the docks for some time past. On inspection board after board was found absolutely free from knots, shakes and all imperfections. Wood of this description should be more largely used for many reasons—its freedom from waste (there being no dead knots to cut out), and its beautiful grain, and as one of the cheapest and best woods for decorative purposes, suitable for church and school fittings, furniture work, &c. We are informed by the owners, Messrs. C. J. Wade & Co., that this parcel has been specially selected for them, kiln dried abroad, and carefully stacked under sheds.

PLUMBERS' COMPANY.

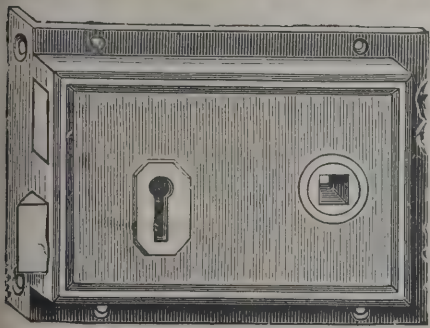
At the meeting of the Quarterly Court of the Plumbers' Company held on Saturday at Guildhall, the Master (Alderman Sir Stuart Knill, Bart.) took the oath as Master on his re-election to office for the ensuing year, and Sir Philip Magnus and Mr. Philip Wilkinson, F.R.I.B.A., were sworn into the offices of Warden and Renter Warden respectively.

A return was presented of the examinations held by the company under their Graded Syllabus of Practical and Theoretical Instruction for Plumbers, showing that the examinations for the current year had been held at twenty-four centres in the United Kingdom, and that the percentage of passes in the preliminary grade of the examinations was 30 per cent. as compared with 49 per cent. in the previous year, and the passes in the intermediate examinations were 30 per cent. as compared with 63 per cent. in 1893.

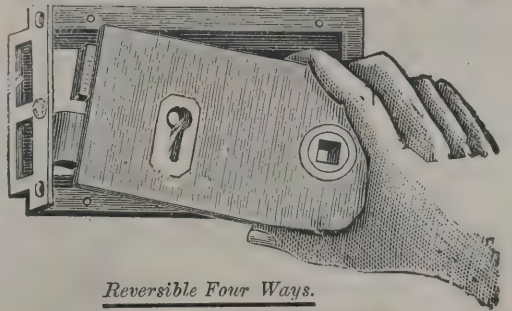
A report from Norwich was received announcing the forma-

HILL'S PATENT LOCKS & OTHER FITTINGS.

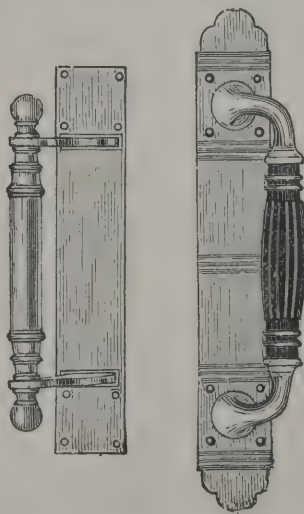
All kinds of Rim and Mortise Locks, Door Furniture, Sash and Casement Fittings, Swing-Door Hinges, &c., kept in Stock.



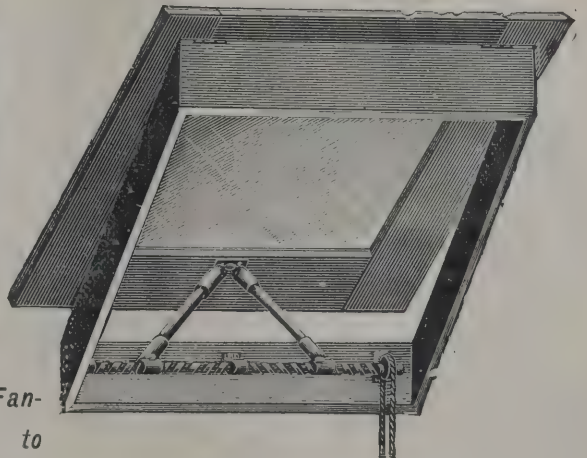
Reversible Four Ways.



Reversible Four Ways.



Hill's Patent Gearing for Fanlights, Skylights, &c., made to suit lights hung every way, and worked with cord or rod.



HILL'S PATENT SKYLIGHT OPENER.

HILL'S NEW REGISTERED WATER BAR FOR CASEMENTS OPENING INWARDS.

Prices and Particulars on Application.

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tion of a district council for the counties of Norfolk and Suffolk to deal with registration of plumbers in that district, hitherto carried out under the direction of the general registration committee sitting at Guildhall, London, including representatives of the United Operative Plumbers' Association of Great Britain and Ireland.

THE FOREST FIRES.

THE *Vossische Zeitung* contains an article by Herr von Hesse-Wartegg, in which he describes a journey on the Canadian Pacific Railroad from Vancouver to Calgary during the late conflagration. He says:—

Two days and two nights we journeyed along the 700 miles of railway through the Rocky Mountains. But not in the usual conditions. We saw nothing of the beauty of the land, for immense clouds of smoke veiled the whole scene, filled the valleys, hung in the woods, and crept up the mountains. The air was hot and stifling, so that we could not open the windows. The sun looked like a red-hot ball, and when it set we could see the burning trees, sometimes far off, sometimes close by. Everything burned and smoked and crackled and sent up sparks; the flames leapt up from tree to tree, or caught the grass and bushes along the line and gnawed at the wooden sleepers; and we thought with alarm of the numerous wooden bridges over the deep cañons, many of which had been damaged by fire a few days before, and had been mended. Only one train per day ran, and what might not have happened since the train before us had passed? We rushed along between the big tree-torches, now and then stopped by one which had fallen over the track and had to be cut up and removed.

All these hundreds of miles nothing was to be seen but fire, smoke and broad fields of white ashes, out of which rose charred stumps and roots of trees. It was pitiful to see some forest giant, its leaves singed by the flames, then its boughs twisting, as if in pain, as the branches kindled one after the other. The railway journey through these parts was a race for life. The anxious passengers looked in alarm out of the windows; at any moment the train might leave the rails and the whole be burnt. The engine-driver and stoker had put on their great-coats, and poured water over each other; all the officials who could be spared were stationed along the line, and at every station the conductor eagerly read the telegrams to see whether the next stretch of road was passable. So it went on

for forty-eight anxious hours, and we could only breathe freely when we reached Calgary and the broad prairies. But worse was before us. During the next forty-eight hours we rushed through the prairies of Alberta, Assiniboia and Manitoba. At Winnipeg we read the first news of the fires in Northern Minnesota. Wisconsin and Michigan were in flames, and the forests along the northern shores of Lake Superior also. Though Winnipeg is about 200 miles distant from the great conflagration, we could even there feel the smoke, and it grew thicker as we approached the burning provinces. We could not see Rat Portage for the smoke, and at every station despatches told of still more and more misfortune. At last we began to meet the fugitives from the townships in the forests, all hurrying away from the scene of disaster. All these settlers, woodcutters by trade, stood at the different stations with the goods they had saved, waiting to enter our train. The more we advanced towards the east, the more frightful was the destruction. We saw the smoking ruins of the burned settlements among the charred stumps of the forest trees; innumerable horses, cattle and sheep with singed hair and wool, or wounds from burning, wandered about in the ashes, or stood on the relatively safe railroad, and had to be driven away to let us pass. At a small water-tank was waiting a group of Swedish settlers, two men, two women and four children. Their half-burnt dresses hung in rags, the hair and beards of the men were singed, they had wrapped their feet in wet rags and the faces and hands of the whole group were black and their eyes bloodshot—a terrible sight. Behind them stood a horse with singed mane and tail. The passengers did all they could to help these unfortunates. They had been surprised by the flames in their settlement, and had barely saved their lives by immediate flight. They feared that their neighbours had perished. Who knew whether a similar fate might not befall us if we proceeded? So we all decided to leave the train at Fort William and go by steamer on Lake Huron to Owensland, and from thence, *via* Toronto, to New York. Meanwhile we passed through burning forests and meadows, and at last, on the afternoon of the fifth day of our transcontinental journey, reached Fort William. But the voyage on the lake was not to be thought of. The immense sheet of water was so covered with smoke that the traffic had to be interrupted. We learnt from the newspapers that several steamers on Lake Superior and Lake Michigan had stranded on islands or banks, so that there was almost as much danger on the water as on the land. So we continued our way along the steep bank of Lake Superior,

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THE "ECLIPSE" PAINT REMOVER & CLEANSER.

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1a CRESCENT, MINORIES, LONDON, E.C.

seeing nothing of its shores or islands. We could scarcely breathe, and our eyes were painfully inflamed. On we went in the night, lighted up by the burning woods, and into the following day. Then we reached Montreal; the danger was past, and we could once more breathe freely, but even here and further on, past the Champlain and the Hudson, the atmosphere was still smoky. At New York no rain to speak of had fallen since June, and the woods, meadows and fields were dried up. The newspapers calculated that during the past week more than 60,000 square miles of country had been burned, a district as large as Württemberg, Baden, Saxony and Hesse put together. The extent of forest would exceed those of Thuringia, the Harz and the Odenwald. And the worst is that from 600 to 700 human beings have died the most terrible deaths.

DWELLINGS FOR THE POOR IN EDINBURGH.

THE sub-committee of the Lord Provost's committee of the Edinburgh Town Council dealing with the subject of dwellings for the poor have resolved to adhere to their former report recommending the erection of one and two-roomed dwellings in area D of the scheme under the Housing of the Working Classes Act, which embraces that portion of the old town lying between the High Street and Cowgate and between Blair Street and Borthwick's Close. They craved a remit to proceed with the erection of one block in the meantime, reporting the estimates before acceptance. Of this recommendation the Lord Provost's committee subsequently approved. The probable cost of this block is set down at about 8,500*l.*, roughly speaking, which is about a quarter of the total sum represented by the scheme to embrace the entire area. In all, it is proposed that there should be four blocks upon this area, to provide 245 houses, of which 106 will be one-roomed and 139 two-roomed. The block to be proceeded with at present will provide 24 houses of one room and 32 of two rooms.

The report of the sub-committee states that the improvement scheme under powers conferred by the Housing of the Working Classes Act, in course of being carried out, will abolish a number of the most insanitary and hopeless slums in Edinburgh. It will unhouse 2,712 persons, who must all be provided for properly. This scheme will make available a few convenient sites for suitable substituted houses for those insanitary hovels about to be demolished. To leave these sites open spaces would no doubt be very desirable. The difficulty

is that the Legislature has imposed the obligation upon the authorities to provide for those unhouse, and at the present time and until Corporations be empowered to take land for the purpose at reasonable value, the sub-committee consider that the authorities are shut up to the utilisation of these sites for rebuilding improved houses. The report examines the sources from which the cheapest houses are at present provided in the city, and finds that as regards the ordinary supply of new houses, as these have been passed through the Dean of Guild Court from week to week for a number of years past, no houses have been erected at rents lower than 10*l.* They consider therefore that Edinburgh suffers severely from the want of convenient sanitary and healthy housing for its poor and labouring classes. It is sometimes argued that this matter may be left to private enterprise, but the sub-committee are unable to detect any likelihood of private enterprise doing anything in the matter. Past experience proves that private enterprise will not be by any means forward in taking up this question. Private philanthropy has done perhaps more for Edinburgh than any other city in the kingdom, but no such agency, other than the Social Union, has as yet come to the front. The sub-committee is convinced after a careful consideration of all the circumstances of the case that the public authorities themselves must face this question in a practical way; and they further consider that, if properly conceived and carried out, with the aid of the facilities provided in favourable borrowing powers, such an undertaking may be financially self-supporting, besides resulting in social and moral benefit to the inhabitants of the districts in question, and therefore to the whole city. Next the report looks into the extent to which other cities are dealing with the housing of the poor, and then illustrates the financial aspect of the rebuilding of area D for the rehousing of those displaced by the Improvement Scheme. It recommends the rebuilding, in whole or in part, of this area—that is to say, the area of ground bounded on the north by High Street, on the south by Cowgate, on the east by Blair Street, and on the west by Borthwick's Close. This area is no doubt somewhat handicapped by the heavy fall of the ground, which adds to the cost of building, but it is meantime the most readily available site for the purpose. In order to realise the best results of light and airiness, convenience and cheerfulness, it is proposed to lay the ground out in four level cross terraces, rising from the Cowgate successively tier above tier. The best features of modern improved housing for the labouring classes will also be adopted, that is to say, the scheme will aim at

SUGG'S COOKING APPARATUS

**GAS
KITCHENERS.**

**GAS OR COKE
GRILLERS.**

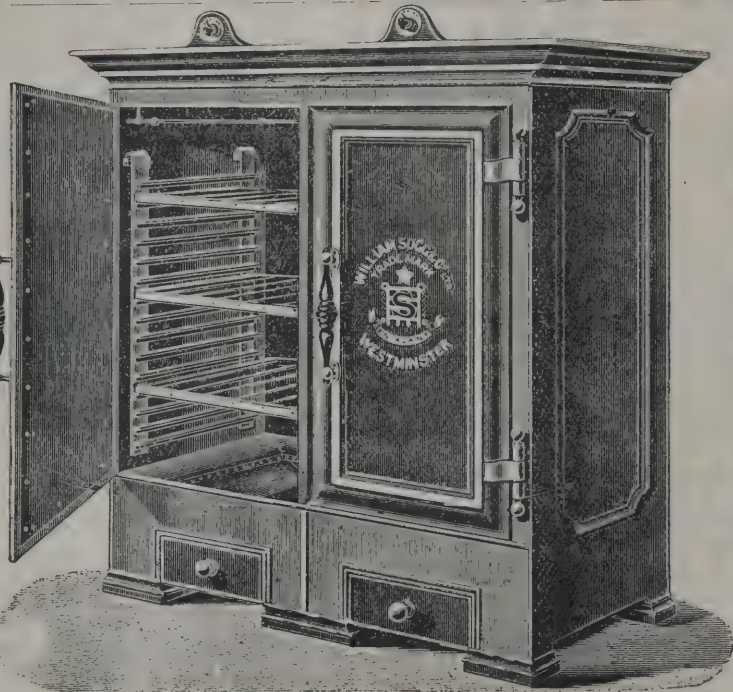
**GAS OR FIRE
HOT-PLATES.**

**GAS
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GAS ROASTERS.

SUPERIOR EFFICIENCY,



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providing cheap and convenient houses for the poorest classes, and chiefly for those about to be displaced by the Improvement (Slum) Scheme—houses which will to a large extent combine the advantages of home privacy, the convenience and supervision of a model lodging-house, with all modern sanitary appliances, a recreation hall, a crèche, children's grounds and other advantages. The committee then considers the scheme with blocks of houses four storeys in height. These tenements (the report says) would require to be of substantial and suitable materials. The area of ground available for feuing purposes may be taken at 1·7 acres or thereby. In order to an equitable statement of the cost of the scheme, it is of course necessary to put a feuing value on the ground to be built on. The above area stated in superficial yards, exclusive of that required for accesses and closes, equals 8,190 superficial yards nearly. The sub-committee consider that a feu-duty of 6s. 8d. for each one-roomed house, and 10s. for each two-roomed house, is the maximum that could be imposed in the circumstances, giving in round figures a total feuing value of 3,150l. at thirty years' purchase, assuming the scheme to consist of one-roomed houses, 106; two-roomed houses, 139; total, 245. This will give a rate of density of population of about 520 persons or thereby per acre. Total cost of erecting four blocks complete, with caretaker's house, &c., 26,850l., to which add value of ground, 3,150l.; total outlay from which return is available, 30,000l. To yield a return of 3 per cent. on outlay of 30,000l., after allowing 33 per cent. for burdens, &c., the rents would be as follows:—106 houses of one apartment, at 1s. 6d. per week, 3l. 18s., equal to 413l. 8s.; 139 houses of two apartments, at 2s. 7d. per week, 6l. 14s. 4d., equal to 933l. 12s. 4d.; gross yearly rental, 1,347l. 0s. 4d.; deduct 33 per cent. for burdens, repairs, empties, &c., and contribution to sinking fund, say 447l. 0s. 4d.; net yearly rental, equal to 3 per cent. on outlay of 30,000l., equal to 900l. Assuming ordinary burdens, repairs, empties and superintendence amounted to 25 per cent. of the rental, the sum available for sinking fund is thus only 8 per cent., or 108l. per annum, which sum, earning interest at 3 per cent., would take 74 years to liquidate the capital sum of 30,000l. even if the rents were maintained at their original figure. But as the property would be considerably depreciated in value before the expiry of 74 years, and the cost of repairs considerably increased, it is unlikely that a yearly contribution of 108l. to a sinking fund could be maintained, so that it would probably require over 80 years to repay first cost. To repay original outlay within a more

reasonable time, it would be necessary to increase the rents of one-roomed houses from 1s. 9d. for the upper flats to 2s. 3d. for those on the first or second flats, and from 2s. 9d. to 3s. 3d. for houses of two apartments. The result of this increase in rental would be as follows:—106 houses of one apartment on an average of 2s. per week, 5l. 4s., equal to 551l. 4s.; 139 houses of one apartment on an average of 3s. per week, 7l. 16s., equal to 1,084l. 4s.—gross yearly rental, 1,635l. 8s. Burdens, empties, repairs, superintendence, 25 per cent., 408l. 17s.; interest on capital sum at 3 per cent., 900l.—equal to 1,308l. 17s.; sum available for sinking fund, 326l. 11s. This sum is rather less than 20 per cent. of the gross yearly rental, and with the same contribution yearly earning interest 3 per cent., would take forty-five years or thereby to reach the sum of 30,000l. With the scheme self-supporting, forty to fifty years is the shortest period at which the first cost could be repaid, unless the rents were to be still further increased. Should it be considered desirable to repay borrowed money in less time, then the city would require to contribute to the sinking fund. The outlay would only be temporary, as a considerable revenue would be derived from the properties when the debt was liquidated. The sub-committee desire further to say that, in view of the difficulty of maintaining in good sanitary condition the large number of properties scheduled under the Improvement Scheme, and of the unavoidable interference with the work of the public health committee in its regular oversight and maintenance of this class of property on account of said Improvement Scheme, it is extremely desirable and essential that this important question should be disposed of without delay. The sub-committee consider that they have presented a fair statement of the whole circumstances of this difficult subject, and while seeking to provide housing thoroughly well got up and conducive to the best interests of the health, comfort and morality of this section of the inhabitants of the city, they have also endeavoured to do what has not been done before, viz. to provide proper housing within the reach of the poorest of our fellow-citizens, and that without burdening the ratepayer with any share of the cost. They consider that in adopting such action as will tend to abolish "slum" life as known in the past, the city authority would be following a much more economical and wise policy than to allow "slum" conditions to increase year by year in spite of every possible effort at improvement, and be again compelled to adopt after a few years a revolutionary and costly improvement scheme.

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LAND FOR PUBLIC IMPROVEMENTS.

AT one of the meetings of the section of Sanitary Science and Preventive Medicine of the Sanitary Congress at Liverpool, Alderman Charles Burt, a member of the Surrey County Council, read a paper "On the Laws relating to the Acquisition of Land for Isolation Hospitals, Workmen's Dwellings and Public Improvements." He urged that an Act should be passed making the recent scattered improvements in the law of expropriation apply to all lands required for necessary and useful public purposes, and consolidating and amending the various Acts on the subject, making them into a clear and intelligible whole, and particularly that the new Act should embrace the following provisions, viz. :—(1) That orders of the Local Government Board and of the County Councils (subject to confirmation by the Local Government Board) for com-

pulsory acquisition of land required by local authorities for public purposes, made after due notice and public inquiry, should have the force of the law without an Act of Parliament. (2) That application for such orders may be made at any time on giving the prescribed notices, instead of being confined as at present to the months of September, October and November. (3) That the abolition of the additional price for compulsory sale should be extended to all the above cases, and the betterment clauses of the Housing Act of 1890, or some analogous provisions applied thereto where appropriate. (4) That the provisions of the Act of 1894 as to costs of counsel and witnesses should also be made of general application. 5. That the Local Government Board or the County Council, as the case may be, should be enabled to exclude the operation of section 92 of the Lands Clauses Act, 1845, in any cases where they think fit to do so. 6. That county courts should be authorised to deal with all compensation cases up to 500l., and that all the authorised tribunals be enabled to dispose of the claims of owners, lessees and occupiers in respect of the same property at one and the same time. He submitted that these amendments of the law were reasonable and just, and would tend to facilitate very largely the carrying out of public works and improvements by local authorities, and would reduce the cost and delay of acquiring land, and at the same time provide for full and fair compensation and protection to all parties interested in the property to be acquired. The mere existence of such an Act as he had suggested would do more than anything else to bring about agreements between public bodies and owners of land on reasonable terms, because land-owners would know that if such terms were not accepted the public authority could promptly and inexpensively bring compulsory powers into operation.

Mr. Washington Lyon said he was of opinion that the law should be altered as suggested. He thought there was no danger through an infectious hospital being placed in any locality if proper regulations were carried out inside the hospital.

Mr. J. Lemon, C.E., said that as an owner of property he should be very sorry to see any law pass by which a landowner would be robbed of that which he possessed; but what he maintained was that he held his property subject to the reasonable rights and wants of the community. He proposed, "That this section approves of the conclusions of Alderman Burt's paper, and recommends the council of the Sanitary Institute to take measures to secure the early adoption thereof."

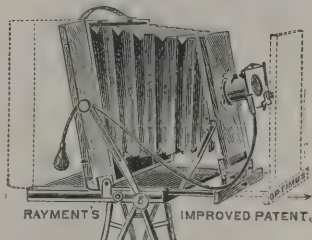
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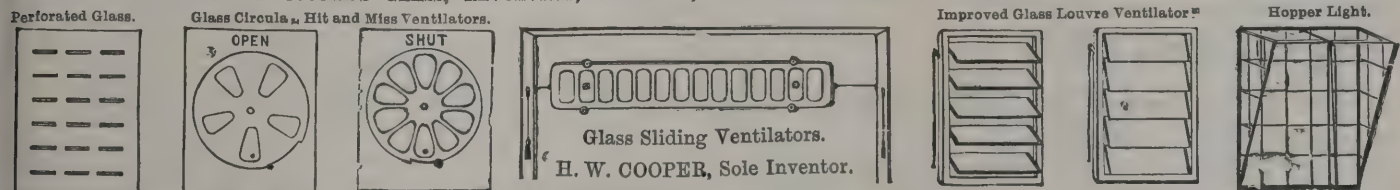


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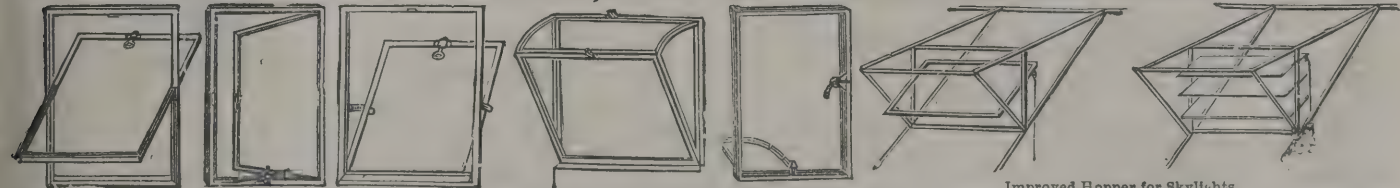


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Dr. Brown seconded the motion, remarking that while property had its rights, it also had its duties. In Lancashire the large landowners realised their responsibilities in that direction. Alderman Burt, in replying, pointed out that parish councils had now wider powers than Liverpool or other large towns in regard to the subject under discussion. Of course that was absurd, and ought not to continue. His object in bringing the matter before the Congress was that it might go forward with its approval to the Local Government Board, or to members of the Government, in order that, if possible, next session a Bill might be passed on the lines he had suggested.

The resolution was then adopted.

THE RIVER AIRE AT LEEDS.

A PAPER was read by Mr. W. Horsfall, of the Camp Road Ironworks, on "The Cleansing of the River Aire," at the opening meeting of the session of the Leeds Association of Engineers. The question of cleansing the river Aire was not, he said, a question that really belonged to mechanical engineering; but mechanical engineers could possibly give an opinion on the subject as well as any other class of individuals, or at least they might do as much towards accomplishing the object as those that had the subject in hand. He had a pamphlet written by Mr. Malcolm McCulloch Paterson, M.I.C.E., in which he said that in the year 1866 a letter was sent to Sir Robert Rawlinson's River Commission, written in legible characters with a pen dipped in the water of the river Calder at Wakefield Bridge, and sent by a humorous correspondent as a silent but eloquent witness in testimony of the pollution of that river. Some parts of the river Aire and its tributaries were even worse. Mr. Horsfall explained by means of drawings how he proposed to deal with the subject of cleansing the river Aire, so far as Leeds was concerned. He proposed that the sludge from the bottom of the river should be collected and not be dependent upon floods, which might move some of the sludge out to sea, or at least out of this district, not forgetting that while their sludge was going out to sea they had a fresh supply coming down from Bradford and above to fill its place. It was perfectly fair that the districts below Leeds should complain at their having all the pollution of the river forced on them without a voice in the matter. When they remembered that there was only a fall of 79 feet from the boundary of

Leeds to the sea, they would see how the rule on friction in water-pipes would apply, and what the flow would consequently be. The people of Leeds had reason to complain at having the pollution of all the towns above it on this stream, and they might justly say that it was of no use their attempting to cleanse their portion if all the towns above did not cleanse theirs. This was where the rights of the West Riding County Council operated. He had not considered the question outside their own boundary. His survey was only to see if it was possible for them to cleanse their portion. If so, then it was possible for those higher up the stream to cleanse theirs; because the further they travelled towards the source of supply the less there was to cleanse. The Calverley Mill dam was above the city boundary, and it was a very favourable point to commence operations, or at least where the other towns delivered theirs. By again referring to the drawing, he showed how he proposed to collect the sludge at the point named. This he should propose was the duty of the nearest town or number of small towns like Rawdon, Apperley, Idle, Yeadon, Guiseley, &c. There were about ten dam heads or weirs in the city, where some attempt could be made to collect the sludge now lying in the river—the accumulation of years. And there were seven water wheels. For the purpose of explaining what might be done towards remedying the evil, he proposed to build at each of those weirs a trap or lock for the purpose of collecting the sludge as quickly as possible. And from the construction of those locks the bottom of the river would be reached. Nature had been good enough to provide a special point on this river where Leeds could be materially assisted in the final operation by using the tail-race of the Old Mill at Hunslet, now unoccupied. When making his survey he found that this property had been bought by the Aire & Calder Company; and, perhaps, they had in view some scheme of cleansing this part of the river. They were quite satisfied that the river must be cleansed. The important question was, How? They would like to have a few days' fishing on the banks of the river Aire in Leeds. But before they could arrive at that state of things they must have the accumulations of generations of pollution disposed of. So this accumulation of sludge must be gathered. And they might find that some kind of trap or lock would have to be used. Their experience with the sewage sludge, or perhaps they ought to call this material precipitation, at Knostrop, might be of some use to them. They would remember that when this plant was opened it was to be self-supporting, and this precipitated sludge was to be worth

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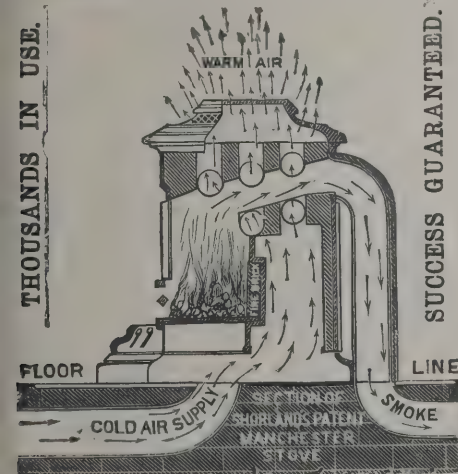
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about 5 $\frac{1}{2}$ per ton for manure. He was informed that they gave it away, and were glad to get clear of it. If it was true that when there was a flood the machinery was shut down, and the flood doing the work by carrying the contents out to sea without the consent of the inhabitants below Leeds, then a flood was a godsend all round, and gave the 79 feet fall from Knos-trop to the sea an extra push. Now, by the use of those locks or traps, as shown, they might have a little flood on the river every Saturday at some part of the stream, or, if they would like it better, put a sluice gate into each weir until they had cleared the sludge from the bottom of that portion they were operating on, say, from one weir to the next, and so on until the lock was cleared. He did not propose to occupy their time with the Sheepscar beck. Their distinguished fellow-citizen, Mr. Jackson, with the assistance of Sir Henry Roscoe, had that question in hand, he was informed, on behalf of the Leather Trades Association. Let him return to the river as they had it. He might ask who would be affected by either of the schemes suggested being brought into use? By adopting the trap or lock system there was no interference with the rights and privileges of the owners of the water-right. He proposed to give them in return a stream of water so far cleansed from slimy sludge, and with that a more pure atmosphere. But, while he promised that, he had that great question of the sludge to deal with. They saw how he proposed to deal with it, but that was not finding a home for it. Besides, he was not prepared to say that there was a manurial value in it, or at least enough to make it marketable. But as they had to find a home for the sludge taken from their street gullies, they might possibly find a home or use for the river sludge. There was low-lying land at different parts of the river. This land might be used. They had been filling up old quarries with the ashpit refuse of the town, so that they could not fall back on them. The West Riding Council objected to it being sent down the river outside the Leeds boundary. Now, if they adopted some kind of trap or lock situated at the several weirs on the river, the difficulty of finding a home for this sludge would be lessened. These locks would cost, say for argument's sake, 3,000 $\frac{1}{2}$ each, or 24,000 $\frac{1}{2}$ at the least for the whole. Then there would be the annual charge of attending them. This scheme, to his mind, would solve the difficulty of cleansing and keeping clean the river without in any way interfering with the manufacturers on the banks. There was one other question that existed, and that was compelling the manufacturers to abstain from polluting the river. They might ask, where were they to find a home for their effluent

refuse? They could get clear of their ashes, but manufacturers' sludge was a different matter. A scheme for removing all the weirs in the city would mean abandoning all the water-wheels. He did not know whether any one had ever thought out the question as to what the motive-power of this stream within the city was worth. Now, if they compared the King's Mills, Swinegate, with the Queen's Mills, Bradford, which was sold in the year 1869, as an example, for both of those mills were soke mills, the soke rights of Queen's Mills were valued at 12,500 $\frac{1}{2}$. Still, the whole estate was sold for 19,000 $\frac{1}{2}$, and the Corporation of Bradford bought the Queen's Mills goit, &c., for the sum of 8,300 $\frac{1}{2}$. If they averaged the seven mills at that figure, they reached a total of 58,100 $\frac{1}{2}$. And, perhaps, there would not be much difficulty in buying up all the water rights on the river—that was motive-power rights—for this sum, the water supply remaining as before, but in a more pure state for manufacturing purposes. If the clearing away of all the weirs was the result, they had to consider that the source of supply was so small, and possibly would be so far short of the demand, that by remedying one evil they would have raised a new one. If they reckoned that their works used river water for, say, ten hours per day for six days in the week—that was, they drew on the stream a steady pull of sixty hours per week, and allowed the water to continue to flow—they lost 113 hours' value of the stream, taking six at night to six in the morning, and from one on Saturday to six on Monday morning; so, if the water of their river was of value to the manufacturers, they must have preserves, as at present. To his mind, there was nothing to gain by buying up the power rights or having them given to them. So they still stood in the two positions, viz. could their manufacturers find a home outside the river for their liquid refuse? If so, would the river be cleansed by a flood once or twice a year? He could not see but that the manufacturers, to conform to such an event, would each have to have a settling tank in their yards. Of course, if they were faithful the river would then have a chance to cleanse itself, and he had no doubt that if the city fathers thought for one moment that it could or would be done in that way, every manufacturer on the banks of the river would have to carry the law into force for that end. But by the provision of public tanks or locks at different points on the river they might cleanse it and leave their trade untrammelled with such a difficulty, because the standards of purity were sure to press hard on them. Referring to the Tenter Lane goit, Mr. Horsfall said it occupied a very important part of the subject, and as it had been mixed up

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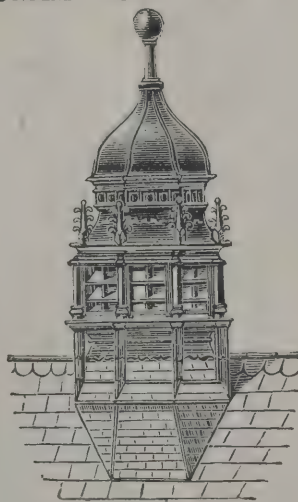


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with a lawsuit, he might step on dangerous ground; but, still, that goit which was about 500 yards long—that was, from Swinegate beck to the point where it entered the river—seemed to him to offer special advantages. The first was to fill it up as a sanitary benefit, as no one seemed to know of any use it was. The King's Mills would be better without it as a water-power. But that had not always been the case. He believed he was right in saying that there were two water-powers on the east side of Leeds Bridge, opposite to the commencement of the Calls. They would all remember one of them at least. Be that as it might, when the wheels were removed the weirs or sluices were left. Now, if those weirs were removed there would be no stagnant pool as there was on the west side of Leeds Bridge. The proof of that was shown by the different currents there were on that short stream, as well as the extra fall in those two tail races. Secondly, they had a lock formed in that goit needing only a filter-gate at the river end. That would be specially useful, as the sludge collected could be put on boats and sent away to fill up low-lying land below Leeds. That goit offered them a grand point for the proof that the bottom of the river must be reached before they could be assured of a cleansing process.

Mr. A. Atkinson said this was a very vexed subject, and one that needed immediate redress. The bed of the river was being filled up, and floods on the low-lying lands occurred more frequently than they used to do. Dredging should be carried out, and the original level of the river should be reached, and that would be the means of preventing floods. Mr. Horsfall's idea looked very feasible, but whether it would be practicable or not would be a question of test. He was afraid that the settling process would be a very slow process, and scarcely adequate.

Mr. Moorhouse said that the whole question seemed to resolve itself into dredging first and dredging last. He agreed with Mr. Atkinson that to purify the river bottom by a system of settling tanks would be a very slow process.

Mr. W. H. Wood could not see that settling tanks would be at all efficacious, unless they were always in operation. They forgot that Leeds had done its best to purify its own sewage, and why should they be at the trouble and expense of purifying sewage from Skipton, Keighley and other towns higher up? The remedy was to stop these places from putting their filth into the river. That was the only cure he should suggest, and if it were carried out, the stream could be made so pure that in twenty years they would be able to catch fish in it again.

Mr. B. Holgate said that, as a matter of fact, the river had been filling up for many years—long before Leeds became a large town. Alluding to the weirs, he said that the spaces between them formed settling tanks, and he did not think they could say that they got much of the mud that did not belong to them, because there were weirs above Leeds. They had got the settling tanks, and he thought the best way would be to dredge the bed of the river.

Mr. Drake agreed with Mr. Wood that what should be done was to prevent the refuse getting into the river. He did not think much of the settling process. They must look at the question from a commercial point of view, and would have to purify the stream as much as they could.

Mr. Charles Scriven stated that on looking at the river from Victoria Bridge after four or five days' holiday, he had seen the water perfectly clear. He did not consider that the weirs were much of settling tanks, inasmuch as the volume of water coming down the river and striking against the weir caused a strong eddy, which would wash the deposit from the face of the weir quicker than in the bed of the river. He did not think that the purification of the river depended upon the dredging of the bottom, but it would be brought about, as Mr. Drake had said, by compelling all those who turned their refuse into the river to purify it before doing so.

Mr. Tempest, in moving a vote of thanks to Mr. Horsfall, said that dredging would remove the accumulation of years, but it would not prevent refuse coming into the river. He believed the only way to purify the river was to prevent the refuse getting in, and then would be the time to dredge out what was in, and not before.

MOSAICS.

(Concluded from last week.)

OF all celebrated pavements perhaps the most unique is that of Siena Cathedral (thirteenth century); it is inlaid with designs in colour and in black and white, representing biblical and legendary subjects. The finest portions are beneath the domes, and depict scenes from the history of Abraham, Moses and Elijah, which are said to be executed with wonderful boldness and skill. No paper on mosaics would be complete without the mention of St. Mark's, Venice. "This church," says Lanzi, "remains an invaluable museum, where, commencing with the



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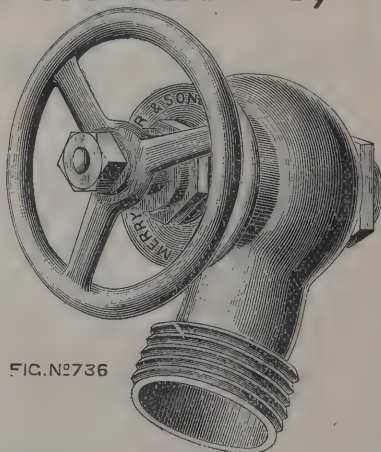
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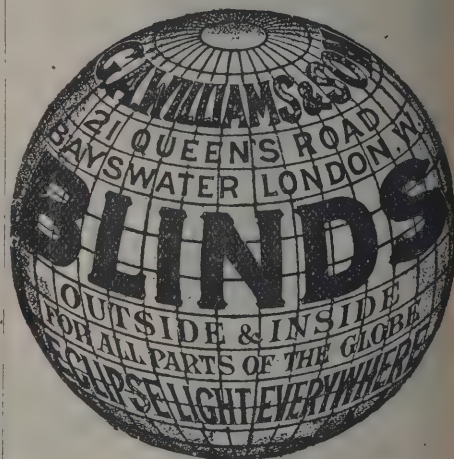
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eleventh century, we may trace the gradual progress of design belonging to each age up to the present, as exhibited in many works in mosaics, beginning from the Greeks and continued by the Italians." Not having seen the mosaics of St. Mark's, I must obtain my description elsewhere, and being all supposed, as art lovers, to read Ruskin, as Christians do the Bible, I will for once forbear dragging in his honoured name. I think, though, that it would be of interest to give a short description by Mr. G. E. Street, who delivers himself thus:—"The most prominent figure is that of Our Lord, who is seated and surrounded by prophets. Below are the emblems of the four Evangelists and the four rivers of Paradise. Whilst again, in the west dome, He is surrounded by the Apostles and Evangelists, and everywhere the general scheme is a lesson to those who, nowadays, too often forget the relative importance, or the proper order and arrangement of the Divine story in the schemes they adopt for stained-glass and mural decoration; but it may be observed that wherever modern mosaics have taken the place of old ones, there at once we see a complete collapse and a loss of all good effect. This is mainly owing to the attempt which the designers made to produce effect of pictures, instead of thinking first, and mainly, of the decorative effect of their work on the building. But, at the same time, it is obvious that their eyes had lost all feeling for good colour, and that, in attempting to draw with a certain amount of academical accuracy, they had equally lost all sense of the prime necessity in such works of simplicity of arrangement and directness in the telling of their story. There is no part of the church in which some of the best of this sort of decoration can be studied with more ease than in the cloister on the north side of the nave. Here the mosaics are so near the eye, and the details and colour so fine, that one is never tired of admiring them." Mr. Street's remarks of the attempt on the part of many of the designers to produce mere pictures shows plainly the disastrous effects which the revival of the art of painting and the introduction of fresco work in the fourteenth century did to the mosaic art, which seemed to have lost its independence and its old Greek character. The mosaics from Titian's picture on the west side of St. Mark's, and Raphael's in the Chigi Chapel in St. Maria del Popolo, and many others in Rome, are striking examples of this insipid treatment. Realism is a mistake in mosaic work, and loss of freedom must inevitably mean loss of beauty. Mr. Street has much more to state in praise of the pavement. "Of all the features," he says, "of this grand church, that is, next to the gorgeous colour of the walls, is the

wild beauty of the pavement. It is throughout arranged in the patterns common in most *Opus Alexandrinum*. Instead of being made level, it swells up and down, as though its surface were the petrified waves of the sea, on which those who embark in the ship of the Church may kneel in prayer with safety, the undulating surface serving only to remind them of the stormy sea of life and of the sea actually washing the walls of the streets and houses throughout their city. It cannot be supposed that this undulation is accidental, and the corresponding example of St. Sophia, Constantinople, where we have it on record that there is an intentional symbolism in just such a floor, is conclusive as to the intention of its imitators here." The basilica of St. Maria Maggiore, in Rome, is exceedingly rich in mosaics. The pictures in square panels on the walls of the nave represent scenes from the Old Testament; those about the arch, Christ's birth and infancy, and they are looked upon as among the earliest and most interesting in Rome, as they retain that vigour and freedom and harmony which is so lamentably absent in later work. The colouring is particularly rich and beautifully blended. It would be impossible to mention the many more exquisite mosaic treasures which have been handed down to us from remotest times. The Ravenna mosaics, with their choice harmonies of blue and gold, the stately monumental mosaics of St. Apollinare Nuovo, the green and gold and silver beauties of San Vitale's ceilings, the choice and dignified ornamentation in the narthex and upper galleries of St. Sophia, Constantinople, and the golden glories of St. George at Salonica. Fortunately they remain to us, and are likely to remain, for as Titian has said of mosaic, "it is the true painting for eternity." Of Florentine mosaics there is not much to be said; they belong to a later period, and consist of inlaid work in silicious or precious stones, jasper, chalcedony, amethyst, agate, cornelian. The mode of working is as follows:—A slab of marble about $\frac{1}{8}$ of an inch thick, and generally black, is prepared by carefully cutting out with the saw and file the patterns to be inlaid; the gems are then cut and accurately fitted to these patterns in their polished and finished state, otherwise the stones, being of unequal hardness, would in some instances wear away too quickly. After the surface is thus prepared it is veneered on to a thicker slab, and is then complete. Some examples of Florentine mosaic are to be found in India. It is a sectile mosaic, and was introduced into India by Italian workmen in the seventeenth century. The best of these examples are to be found at Agra. Mosaics of coloured glass, pastes and precious stones, somewhat similar

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to the modern Florentine mosaics, were used by the Byzantines in the decoration of their ceilings and in wall-pictures.

As we approach more modern times the subject grows less and less interesting. There was some sign of revival in the mosaic art of the seventeenth century. In the Vatican there is a workshop devoted entirely to preparing mosaics for St. Peter's, and at the Monreale Cathedral there is a similar establishment. Sir Christopher Wren fully intended to have the cupola of St. Paul's decorated with mosaics, and had even gone so far as to enter into negotiations with Italian workmen for this purpose, but was not permitted to proceed with the work. The St. Paul's of Sir Christopher Wren's time has undergone a wonderful interior transformation, and it only remains for many of those fusty, broken-nosed and vulgar monuments of our great men to be heaved into the Thames, and for the great work of mosaic decoration which is now being undergone to be completed, and St. Paul's will indeed be a temple fully fitted for the worship of the Greatest Architect of all. The late Alfred Stevens, who designed four of the glass mosaics to fill the spandrels under the whispering gallery of St. Paul's, takes premier rank among modern mosaicists. The subject of his work was the four great prophets, and the treatment is grand and imposing. Mr. G. F. Watts has designed the four corresponding figures of the evangelists. These are now, I believe, all in position. The decoration of the east end of the cathedral, which Mr. Richmond is undertaking, and has been employed on for the last two years with twenty-five assistants, will, it is stated, take another ten years to complete. The interior of the great dome is also to be decorated by this artist. Signor Salviati has also done much for mosaic work in England. The spandrels of the Albert Memorial were executed by him, after cartoons by Clayton & Bell. Of this work the late Sir Gilbert Scott says:—"This admirable branch of art, so gloriously carried out in the later periods of Roman and Byzantine art and in the Middle Ages, and which seems in so marked a degree to be special handmaid of, or rather the sister art to, architecture, has been revived in all its pristine perfection by Signor Salviati." Salviati also executed a mosaic picture of the Last Supper for the altar of Westminster Abbey. Mr. Lewis Day considers that Salviati has received an undue share of credit for the mosaic revival in England; still he must have the credit at least of initiating it. Mr. Day, after speaking of his persistent energy and business ability, says:—"For the rest, the repute of English mosaics (good or bad) is due neither to Dr. Salviati nor to Sir Gilbert Scott, but to the

artists who designed them." Well known amongst these may be mentioned Mr. John Clayton, Mr. S. Bell, Mr. Burne-Jones and Mr. Walter Crane. With these fond workers there is a future yet for mosaic work. When boldness, breadth and beauty in blending, when the consideration of aptness of surroundings, when the study of grand pictorial composition and effect shall have taken the place of narrow academic precision, strained pictorial effect, inharmonious blending, and studied, inappropriate picturesqueness, then the decorative glories of the Byzantine temples, and of the Roman basilicas may be repeated, and we may hand down with confidence to posterity the work which is "the true painting for eternity."

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 17621. William Smith, for "Improvements in the manufacture of bricks or building blocks."
- 17628. Henry Bartlett, for "Improvements in syphon cisterns for water-closets and other purposes."
- 17633. Heinrich Hase, for "Firebar."
- 17655. Frederick James Orwin, for "Improvements in chimney-pots and the like."
- 17697. Arthur Coleman, for "Improvements in and connected with the construction of window-sashes."
- 17797. John Kennedy, for "An improved window-fastener."
- 17821. Robert Thomas Bells, for "New or improved apparatus or device for testing for leakage in drains or other pipes."
- 17857. Joseph Goulson, for "Thief-proof window-bolt."
- 17862. Charles Smith, for "Improved syphon-tank for flushing water-closets, lavatories and the like."
- 17920. William Clark and Arthur William Rammage, for "Improvements in fireproof floorings."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

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No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

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As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

CONTRACTS OPEN.

BALTIMORE.—Oct. 16.—For Building Infirmary (the Father Davis Memorial). Mr. W. H. Hill, Architect, 28 South Mall, Cork.

BARNET.—For Erection of Horticultural Building. Mr. Maxwell Williams, Surveyor, 29 Great St. Helen's, E.C.

BARNET.—Oct. 16.—For the Supply of 400 Tons 1½ Inch Broken Granite, 200 Yards Clean Coarse Gravel and 200 Yards Double Screened Hoggins. Mr. H. W. Poole, Local Board Offices, Barnet.

BARNESLEY.—Oct. 18.—For Building Pair of Semi-detached Houses. Mr. Robert Dixon, Architect, 5 Eastgate, Barnsley.

BARROWFORD.—Oct. 23.—For Building Board Schools. Mr. T. Bell, Architect, 14 Grimshawe Street, Burnley.

BASFORD.—Oct. 22.—For Erection of Buildings for Infectious Diseases Hospital. Mr. Herbert Walker, Architect, Newcastle Chambers, Nottingham.

BELFAST.—Oct. 22.—For Teacher's Residence for National School. Mr. J. J. Phillips, Architect, 61 Royal Avenue, Belfast.

BELFAST.—Nov. 5.—For Building Hospital. Mr. W. J. Fennell, Architect, 11 Chichester Street, Belfast.

BELFAST.—Nov. 8.—For Service Reservoir and Main Conduit. Mr. L. L. Macassey, Engineer, Waterworks Offices, Belfast.

BIRKENHEAD.—Oct. 18.—For Building Fire Station. The Borough Engineer.

BOSCASTLE.—Oct. 18.—For Water Supply Works. Mr. R. H. Worth, Engineer, 42 George Street, Plymouth.

BOSCOMBE.—For Building Gordon Hotel. Messrs. Dan-caster & Taylor, Architects, 138 Christchurch Road, Boscombe.

BRIGHOUSE.—Oct. 15.—For Building Twenty-one Houses. Messrs Sharp & Waller, Architects, 18 Bradford Road, Brighouse.

CADOXTON.—Oct. 12.—For Additions to Board Schools. Mr. G. Thomas, Architect, Queen's Chambers, Cardiff.

CARDIFF.—Oct. 15.—Rustic Bridge, Roath Park. The Borough Engineer.

CARDIFF.—Oct. 31.—For Building Church. Mr. G. E. Halliday, Architect, 14 High Street, Cardiff.

CARLTON.—Oct. 17.—For Stationmaster's House and Cottages. Mr. Wm. Bell, North-Eastern Railway, York.

CARLOW.—Oct. 15.—For Two Boilers for Asylum. The Secretary, Board of Control, Custom House, Dublin.

CHARMINSTER, DORSET.—Oct. 31.—For the Erection of a Church. Mr. G. T. Hine, 35 Parliament Street, Westminster.

CHELSEA.—Oct. 23.—For the Erection of a Doctor's House and Nurses' Quarters. Messrs. Lansdell & Harrison, 12 Compton Terrace, Highbury.

CHELMSFORD.—Oct. 15.—For Additions to House, Duke Street. Mr. Frank Whitmore, Architect, Duke Street, Chelmsford.

CHESTERFIELD.—For Vicarage. Messrs. Evans & Jolley, Architects, Wheeler Gate, Nottingham.

CUMWHITTON.—For Building Board Schools. Messrs Johnstone Bros., Architects, 39 Lower Street, Carlisle.

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DROGHEDA.—Oct. 20.—For Bank Premises. Mr. Walter G. Doolin, B.E., Architect, 20 Ely Place, Dublin.

DROMARA.—Oct. 17.—For Teacher's Residence. Mr. Wm. Scilley, Dromara, co. Down.

EDINBURGH.—Oct. 13.—For Taking-down North Bridge and Constructing New Bridge. Messrs. Cunningham, Blyth & Westland, Engineers, 135 George Street, Edinburgh.

EPSOM.—Oct. 17.—For Alterations to Engine and Boiler-houses. Mr. C. P. King, Engineer, Waterworks Office, East Street, Epsom.

FOREST GATE.—Oct. 23.—For the Erection of a Block of School Buildings. Messrs. J. T. Newman & Jacques, 2 Fen Court, Fenchurch Street.

GUERNSEY.—Oct. 18.—For Chapel, St. Peter Port Hospital. Mr. N. Ferguson, St. Peter Port, Guernsey.

HAMILTON.—Oct. 15.—For Supply of Cast-iron Sluice Valves, &c. Messrs. Leslie & Reid, 72 George Street, Edinburgh.

HODDLESDEN.—Oct. 17.—For Building Five Houses. Mr. J. B. Thornley, Architect, 45 Market Street, Darwen.

HOMERTON.—Oct. 30.—For Well and Borehole at Workhouse. Mr. J. Owen Perry, Clerk, Homerton, N.E.

HOMERTON.—Oct. 31.—For Completion of Well and Borehole at Workhouse. Mr. J. Owen-Perry, Clerk's Office, Hackney Union.

HUNGERFORD.—Oct. 12.—For Additions to Plume Hotel. Mr. Blatch, Brewery, Theale.

KEIGHLEY.—Oct. 22.—For Building Four Houses. Mr. Bethel Rhodes, Keighley.

KILLMALLOCK.—Oct. 13.—For Alterations to Steward's House, Mount Coote. Mr. E. A. Hackett, County Surveyor, Clonmel.

LEICESTER.—Oct. 18.—For Plastic Wire-cut Brick Machine. Croft Granite, Brick and Concrete Co., Leicester.

LEWES.—Oct. 17.—For Alterations to Hot-water Apparatus and Builders' Work in Connection. The Borough Surveyor.

LONDON.—Oct. 15.—For the Erection of Second Portion of Enlargement of Post Office Savings Bank in Queen Victoria Street. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

LONDON.—Oct. 15.—For Addition to the Patent Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place, S.W.

MANCHESTER.—Nov. 5.—For Water Meters and High-pressure Meters. Secretary, Waterworks Office, Town Hall, Manchester.

MERTHYR.—Oct. 19.—For Additions to Treharris School. Mr. John Williams, Architect, Morgan Town, Merthyr.

NEW BARNET.—Oct. 15.—For Residence. Mr. E. Ferguson Taylor, Architect, Station Road, New Barnet.

NEW BROMPTON.—Oct. 24.—For the Erection of an Infants' School. Messrs. Mash & Son, Rochester.

NEW ROSS.—Oct. 30.—For Parish Church. Mr. Walter G. Doolin, B.E., Architect, 20 Ely Place, Dublin.

NORWICH.—Oct. 17.—For New Roof, Floors, &c., St. Andrews, for the Guardians of Norwich Incorporation. Mr. J. B. Pearce, Architect, Upper Ring Street, Norwich.

PORT TALBOT.—Oct. 15.—For Extension of Board School. Messrs. Lambert & Rees, Architects, Bridgend.

RUAON.—Oct. 17.—For Building Cottages at Johnstown. Mr. Charles Bellis, Merlin Street, Johnstown, Ruabon.

RYDE.—Oct. 26.—For Sixteen Hydraulic Pulp Presses for Paperworks. Mr. R. F. Anderson, Engineer, Ryde, Isle of Wight.

SOUTH NORMANTON.—For Infants' School, &c. Mr. J. T. Shardlow, Architect, Blyth Road, Worksp.

ST. GEORGE.—Oct. 20.—For Board School for 840 Children. Mr. F. Bligh Bond, Architect, 36 Corn Street, Bristol.

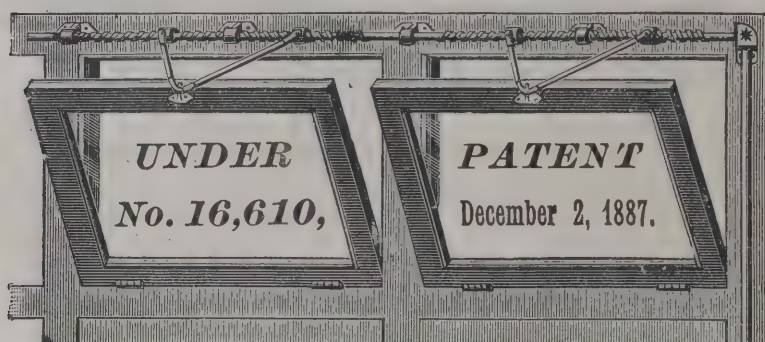
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WALSALL.—Oct. 25.—For Infirmary Buildings. Mr. H. E. Lavender, Architect, The Bridge, Walsall.

WITHAM.—Oct. 15.—For Additions to British Schools. Mr. Frank Whitmore, Architect, Chelmsford.

WITTON GILBERT.—Oct. 16.—For Additions to Schools. Rev. A. Watts, Rectory, Witton Gilbert, co. Durham.

WRAYSBURY.—Oct. 17.—For House. Messrs. Sergeant & Son, Architects, Slough.



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Goodchild, Reading	5,425	0	0
Parnell & Son, Rugby	5,113	0	0
Simonds, Reading	5,000	0	0
Macandrews, London	4,940	0	0
Thatcher, Abingdon	4,753	0	0
Wiltshire, Swindon	4,719	0	0
Polley, Oxford	4,705	10	0
Martin, Maidenhead	4,678	0	0
Wernham, Reading	4,660	0	0
Hunt, High Wycombe	4,593	0	0
Colborne, Swindon	4,500	0	0
Grant, Banbury	4,297	0	0
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Robinson, Wolvercote	3,875	0	0

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G. Osenton, Westerham	276	15	0
Free & Sons, Maidenhead	250	5	0
W. H. Wheeler, Southwark	248	11	8
W. H. Saunders & Co., Bournemouth	244	11	8
Collier & Catley, Reading	217	18	4
G. Kemp, Aldershot	191	6	8
D. H. Porter, London	185	19	2
Kent Road Maintenance Co., Gravesend	178	0	0
W. LEE & SONS, High Wycombe (accepted)	177	4	3

AYR.

For the Construction of Quay Wall, 376 Yards, &c., for the Ayr Harbour Trustees. Mr. H. V. EAGLESHAM, Engineer, 54 Fort Street, Ayr.
H. KENNEDY & SONS, Partick (accepted) . £21,022 11 6

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For Warming Bedrooms, Staircase and Conservatory by Heat usually Wasted from Kitchener Fire at Bankside, Balcombe, Sussex, for Mr. W. Yarham.
T. POTTERTON, Balham (accepted) £75 0 0

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S. J. WARING & SONS, LIMITED (accepted) . £450 0 0

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For Construction of Sewers, Settling-tanks, Irrigation Ground, Iron and Wood Fencing, Road-making, &c., Burtonwood, Lancashire, for the Warrington Union Rural Sanitary Authority. Mr. WILLIAM OWEN, Surveyor, Warrington.
BECKETT & CO., Hartford, Cheshire (accepted) £1,184 0 0

CORSHAM.

For Building School at Corsham for 250 Boys and 174 Infants. Mr. HAROLD BRAKESPEAR, Architect. Quantities by Messrs. PINKS & WATSON, 45 Parliament Street, S.W.
I. Hyde, Keynsham £3,915 11 0
D. C. Jones & Co, Gloucester 3,789 0 0
Light & Smith, Chippenham 3,617 0 0
J. H. Wilkins, Bristol 3,444 0 0
W. Beazley, Calne 3,410 0 0
W. H. Francis, Trowbridge 3,150 0 0
DOWNING & RUDMAN, Chippenham (accepted conditionally) 3,057 0 0

COVENTRY.

For Erection of a Primitive Methodist Chapel and Schools in Ford Street, Coventry. Mr. JOHN WILLS, Architect, Victoria Chambers, Derby.
T. Wright, Foleshill £2,197 4 6
A. A. Wincott, Bishop's Gate, Coventry 2,084 10 0
C. Haywood, jun., Coventry 1,957 0 0
C. Garlick, Coventry 1,954 10 0
T. G. Golby, Coventry 1,882 3 6
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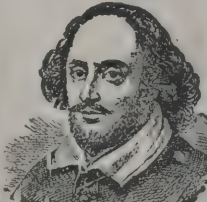
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Kirk & Randall	6,640	0	0
A. Bullock	6,551	6	0
H. E. Tomes & Son.	6,375	0	0
J. Smith & Sons	6,337	0	0
P. R. Hubbard	6,171	0	0
W. Akers & Co.	6,157	0	0
J. O. Richardson (<i>less 40l. for old materials</i>)	6,180	0	0
W. H. LORDE & SON (<i>accepted</i>)	5,975	0	0

HADDENHAM.

For Alteration and Additions to the Board School at Haddenham, near Thame. Mr. W. F. TAYLOR, Architect, Aylesbury.

J. & W. Rose, Haddenham.	£585	0	0
B. Holland, Thame	577	0	0
Mayne & Son, Aylesbury	550	0	0
Webster & Cannon, Aylesbury	518	0	0
R. C. Rose, Haddenham	510	0	0
S. Grist, Aylesbury	498	18	0
W. H. Siary, Kingston	498	0	0
C. Crook, Waddesdon	487	10	0
W. W. Howland, Thame*	448	0	0

* Accepted subject to approval of Education Department.

HANLEY.

For Erection of a Bandstand in Public Park.

C. CORNES (<i>accepted</i>)	£325	0	0
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For Building Corn Warehouse, Newcastle Road. Messrs. R. SCRIVENER & SONS, Architects, Hanley.

Ellis, Hanley	£1,030	0	0
Breeze, Stoke	948	0	0
Baddeley, Hanley	880	0	0
Cornes, Hanley	825	0	0
Yoxall, Stoke	780	0	0
GODWIN, Hanley (<i>accepted</i>)	762	0	0

HARROGATE.

For Building Post Office, Harrogate, for the Commissioners of H.M. Works and Public Buildings.

E. Winterburn, Harrogate	£6,612	10	8
T. Linskill, Harrogate	6,588	0	0
J. Checkley, Harrogate	6,170	0	0
W. Holdsworth, Bradford	5,848	0	0
T. Dickinson, Harrogate	5,573	0	0
W. IVES & Co., Shipley (<i>accepted</i>)	5,549	14	10

HEXHAM.

For Taking-up Old Granite Setts in Fore Street and Repaving with Creosoted Wood Blocks on 6-inch Bed. of Concrete, for the Local Board. Mr. R. T. SURTEES, Surveyor.

Creosoted Redwood.

G. Maughan, Jarrow	£550	0	0
J. Robson, Newcastle-on-Tyne	528	10	0
G. B. Simpson, Newcastle-on-Tyne	504	0	0
Armstrong, Addison & Co., Sunderland	473	0	0
Surveyor's estimate	476	0	0

Creosoted Beech.

G. B. Simpson	525	0	0
ARMSTRONG, ADDISON & Co. (<i>accepted</i>)	494	0	0

For Paving Haugh Lane with Granite Setts and Trammestones. Mr. RICHARD T. SURTEES, Surveyor.

G. Maughan, Albert Road, Jarrow	£776	6	8
W. Robson, Newcastle-on-Tyne	717	15	6
J. Robson, Newcastle-on-Tyne	663	19	0
G. B. SIMPSON, Newcastle-on-Tyne (<i>accepted</i>)	574	9	0
Surveyor's estimate	623	0	0

For Paving Market Street with Whin Chip Setts. Mr. RICHARD T. SURTEES, Surveyor.

W. Robson, Newcastle-on-Tyne	£134	11	1
G. Maughan, Jarrow-on-Tyne	122	3	5
J. Robson, Newcastle-on-Tyne	109	5	6
G. B. SIMPSON, Newcastle-on-Tyne (<i>accepted</i>)	93	10	0
Surveyor's estimate	100	0	0

KING'S NORTON.

For Construction of Sewers, Welch's Hill and Moor Green, Moseley, and at Bournville, for the King's Norton Rural Sanitary Authority. Mr. ROBERT GODFREY, Surveyor, King's Norton, Birmingham.

Cruwys & Hobrough, Gloucester	£1,056	0	0
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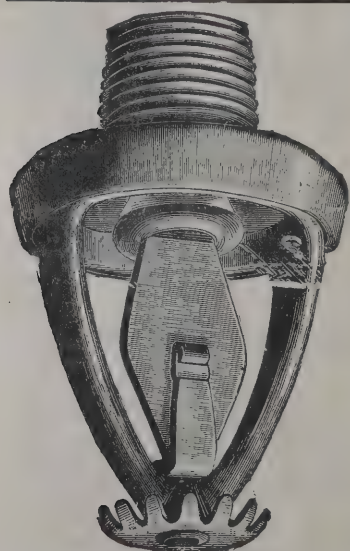
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Brown & Colville, Blackwood	575	4	3
A. Stark & Sons, Auchinstarry, Croy	553	17	10
W. Gow, Kilsyth	505	12	1
T. Pate & Sons, Airdrie	498	5	8
E. Boyle, Easterton, Kirkintilloch	451	16	3
J. Miller, Kirkintilloch	445	10	8

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For the Erection of Three Shop Premises in Old Kent Road. Mr. H. LEWIS, Architect, Upham, Sydenham.

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Yardley & Sons	2,797	0	0
J. W. Faulkner	2,770	0	0
W. Marriage (<i>too late</i>)	2,660	0	0
J. & C. Bowyer	2,645	0	0
T. R. Roberts & Co.	2,590	0	0
Jerrards	2,587	0	0
A. Black & Son	2,580	0	0
W. Johnson & Co.	2,410	0	0
H. L. HOLLOWAY (<i>accepted</i>)	2,283	0	0

For Work to be Done in Putting New Corrugated Iron Roof, &c., to the West Wing of the Bermondsey Workhouse, for the Guardians of the St. Olave's Union. Messrs. NEWMAN & NEWMAN, Architects, 31 Tooley Street, London Bridge.

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Wells	150	0	0
Barrett	85	0	0
BULLERS (<i>accepted</i>)	83	0	0

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S. & W. Pattinson	20,325	0	0
Holliday & Greenwood	20,127	0	0
E. Lawrance & Sons	19,976	0	0
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B. E. Nightingale	20,260	0	0
Holliday & Greenwood	20,146	0	0
Foster & Dicksee	19,999	0	0
Lathey Bros.	19,970	0	0
G. E. Wallis & Sons	19,897	0	0
H. Lovatt	19,823	0	0
Holloway Bros.	19,780	0	0
E. Lawrance & Sons	19,209	0	0
J. & M. Patrick	19,207	0	0
Stimpson & Co.	19,100	0	0

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J. Grover & Son	12,620	0	0
A. Reed & Son	12,508	0	0
Killby & Gayford	12,434	0	0
J. Longley & Co.	12,344	0	0
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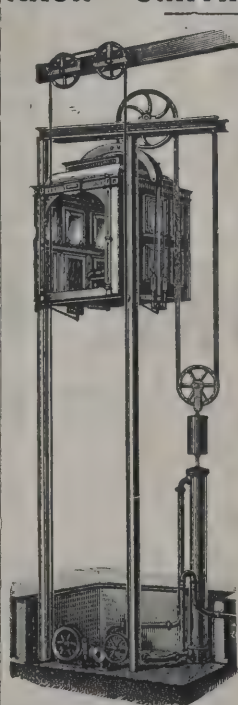
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For Sewering New Chester Road, &c, for the Lower Bebington Local Board.
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T. Myers, Rock Ferry 590 0 0
R. Owen & Co., Birkenhead 590 5 0
J. Alexander, Liverpool 526 16 6
W. Winnard, Wigan 473 14 0
Clark & Cook, Bebington 466 1 2
Morgan & Hazlewood, Birkenhead 418 5 0
J. BARNES, The Village, Bebington (accepted) 424 2 0

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For Building Infectious Diseases Hospital, for the Town Council.
A. S. MORGAN & Co., Newport (accepted) £8,800 0 0

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For Alterations and Additions to Endowed and Infant Schools, for the Managers of Newton St. Loe Schools. Mr. J. ACE BEYNON, Architect, Coleford, near Bath.
C. Wibley, Bath £248 8 0
A. Scott, Bath 199 0 0
F. Amery, Bath 198 0 0
F. J. BLACKMORE, Twerton (accepted) 147 10 0

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A. E. SHIPLEY (accepted) 13 10 0
F. Topham 13 0 0

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For Construction of Two Limekilns, Deadman's Bay, Plymouth, for Messrs. Sparrow & Co. Mr. H. J. SNELL, Architect.
J. Partridge, Plymouth £1,240 0 0
A. R. Lethbridge & Son, Plymouth 815 0 0
W. T. Jinkin, Plymouth 800 0 0
P. Blowey, Plymouth 686 0 0
J. FINCH, Plymouth (accepted) 480 0 0

SOWERBY BRIDGE.

For Works, Wallis Street and Industrial Road, for the Sowerby Bridge Local Board. Mr. FREDK. B. ROTHERA, Surveyor.

Wallis Street.

J. Cockroft, Luddenham Foot £472 17 9
J. Balmforth, Elland 405 0 0
T. Kitchen, Westgate, Halifax 348 8 1
J. Bateman, Wyke, near Bradford 332 1 0
W. Hooson, Sowerby Bridge 267 2 9
W. SUTCLIFFE, Sowerby Bridge (accepted) 320 0 0

Industrial Road.

T. Kitchen 237 0 5
W. Hooson 236 9 8
J. Bateman 233 0 0
J. Balmforth 262 10 0
J. Cockroft 206 2 11
W. SUTCLIFFE (accepted) 214 0 0

THE sanitary committee of the Commission of Sewers have prepared a report recommending that the Remembrancer and the Solicitor should be instructed forthwith to take the necessary steps with a view to the introduction of a Bill into Parliament to obtain the necessary powers at the earliest moment to provide baths and washhouses within the City, and that in the meantime a draft Bill should be prepared. The report was adopted on Tuesday, it being understood that the acquisition of the necessary powers—which the City Commission did not now possess—was the only object of the Bill, and not necessarily the erection of the buildings, which a member said would cost 100,000l.

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THE SALBERG SANITARY DUST-CARTS AND BINS.

WE had recently an opportunity to inspect a notable improvement in sanitary appliances, which has already been officially tested with complete success in France, Germany, Austria and Belgium, and with which our municipal and parochial authorities would do well to make early acquaintance. It is an automatic disinfecting dust-cart or van, the patent for which in all countries is held by the inventor, Mr. Frederick Salberg, whose London representatives are Messrs. F. W. Decker & Co., of 92 Great Tower Street, and Walbrook.

The principle of the invention is as efficient as it is simple, and is briefly as follows:—The cart or van is a covered vehicle having at either side at a convenient height a valve or flap, against which the house or other refuse is tilted. This by its weight, however slight, opens the valve, and is deposited in the cart, when the valve automatically closes, and at the same time a given quantity of dry or liquid disinfectant is distributed over the refuse from an ingeniously-contrived receptacle actuated by the closing of the valve.

Thus all the annoyance and danger to public health caused under the old system by the cloud of dust, with its germs and microbes which is disseminated with every basketful of refuse emptied into the open cart, or by the wind as the cart is proceeding through the streets, is obviated, as well as the unsightliness and the unsavoury odours of decayed animal and vegetable matter which usually forms so large a proportion of the contents. The carts, which will cost little more than those in present use, are adapted for scavenging and all kindred purposes; they are easily emptied and, being lined with galvanised iron, equally easily washed out. The apparatus can, moreover, be fitted at small expense to existing carts. Mr. Salberg is also introducing an automatic disinfecting dust-bin, which is on somewhat similar lines. A galvanised-iron tank of cylindrical form, with a hermetically-fitting flanged top removable for convenience of emptying, has in the latter a valve-lid which closes automatically, sprinkling with each movement a small quantity of disinfectant over the newly-deposited refuse. The supply of disinfectant contained in each bin is sufficient to last six months, and when exhausted it can be immediately replaced at a nominal cost, while the price at which the bins will be retailed is such as to place them within the reach of the humblest *ménage*.

TRADE NOTES.

THE new Infectious Diseases Hospital, Whitehaven, is being warmed by means of Shorland's patent Manchester grates and patent Manchester stoves, with descending smoke flues, and ventilated by means of Shorland's patent exhaust roof ventilators and inlet panels, the goods being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE understand that Messrs. Thornton & Son, of Liverpool, have secured the contract for the superstructure of the new Post Office in Victoria Street, Liverpool. The amount of the contract is stated to be about 112,000*l*.

THE gold key to be presented to Sir John Harwood on occasion of opening the Thirlmere Waterworks for Manchester city has been designed and executed by Messrs. Elkington & Co.

MESSRS. PEACE & NORQUOY have been awarded the prize medal by the Sanitary Institute of Great Britain at the Health Exhibition, Liverpool, for the excellence of their folding partitions. As far as we are aware, this is the first medal ever awarded for folding partitions.

THE extensive offices of Mr. George Brinsley, New Bridge Street, Ludgate Circus, E.C., are being warmed by low-pressure hot-water apparatus, including a number of Parsons's radiators, the whole work being carried out by Messrs. H. Parsons & Harris, heating engineers, of Sidney Grove, Goswell Road, E.C.

BUILDING AND BUILDERS.

AT the meeting of the Glasgow Dean of Guild Court a builder was fined ten guineas for deviating from the plans passed by the Court.

THE London and India Joint Docks committee have decided to erect on the north side of the West India Dock storage accommodation for 100,000 sheep, together with sidings, which will place the stores in direct connection with the general railway system of the country. The railway communication will also be used for grain and other produce coming to the dock, and the stores will be constructed on the same principle as those at the Victoria and Albert Docks, which have given entire satisfaction to the importers of colonial and foreign meat.

THE provisional committee formed for the promotion of a new line from Manchester to the north have chosen Newcastle as their headquarters. They have also resolved to proceed with a Bill in the session of 1895.

Telegrams:

"Mather, Manchester."
"Bathmetal, London."

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Water-testing Apparatus for detecting Impurities in Water, 10s. 6d. and 12s. each.

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AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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147 STRAND, LONDON, W.C.

VARIETIES.

THE Local Government Board have sanctioned a loan of 11,500*l.* for works of sewerage and sewage disposal at Bracknell. The sewage will be purified by irrigation on 22½ acres of land. There are to be two small pumping-stations worked by oil-engines. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham.

WE have received from Mr. Peter Cowell, chief librarian of the Liverpool City Free Public Library, a hand-list of the extensive and important collection of architectural works in the library. To make the contents of the library better known to specialists, some little while ago he recommended his committee to publish a series of hand-lists, or brief catalogues, of certain important classes of books. The committee approved of the suggestion, and this hand-list is the first of an intended series, if it prove successful. The "Hand-list of Technical Works," published in 1892 and distributed freely through the workshops of the city, had a marked effect on the demand for works from the library and branch libraries bearing on the various handicrafts.

AT Leamington an inquiry was held by the Local Government Board at the Town Hall into the application of the Town Council to borrow 4,700*l.* for various public improvements. It was stated that 1,000*l.* of the amount required was for the extension of the adits at the waterworks. Other items in the amount required were for river water supply, new river walk improvement, river wall and new sewers. There was no opposition.

THE Midland Railway Company lately started a train service to Southend, and it is stated they propose to construct a pier and docks at Leigh.

THE Hammersmith Vestry have under consideration a proposal to construct a new lock at Battersea. It is said that since the construction of the Richmond Lock and the erection of the Tower Bridge the flow of the river has decreased so much that navigation is rendered almost impossible near Hammersmith.

IN the course of a short article the *Standard* says:—The proceedings of the County Council with reference to the southern approach to the Tower Bridge contain no promise of the speedy carrying out of that important project. The Council seem in no way disposed to abandon the *non possumus* attitude they have adopted from the first, if we may judge from

the report which has been drawn up by their parliamentary committee. Out of mere pedantry the Council are allowing an important line of traffic to be seriously embarrassed and a splendid bridge to be deprived of nearly half its value to the teeming population of South London.

A GROUP of twelve cottage almshouses, under the will of the late Mr. Thomas Lockerby, Addiscombe, Surrey, have been erected and opened at Burnhead, near Liberton, at a cost of between 5,000*l.* and 6,000*l.* Mr. Lockerby was a native of Edinburgh, who died in 1887, leaving about 30,000*l.* to found almshouses for persons in reduced circumstances. Messrs. M'Whannel & Rogerson, Glasgow, were the architects.

THE *Glasgow Herald* says:—The want of water and the scarcity of coal in the Campbelltown district is preventing the distilleries from making a start for the season. In Stranraer also a water famine is in immediate prospect.

THE Blackpool Corporation have decided to purchase, at a cost of 32,000*l.*, three large estates to the north of Claremont Park, for the purpose of constructing a new promenade and carriage-drive, with a view to adding an extensive suburb to the town.

AT a conference held at Liverpool between representatives of cattle importers and the Mersey Docks Board with regard to the provision of further accommodation for the growing trade in United States cattle at that port, it was agreed that the best scheme would be to enlarge the present lairage at Woodside, and it is understood that about 100,000*l.* will be spent by the Mersey Docks Board in carrying out the project.

THE works committee of the Edinburgh and District Water Trust have adopted the recommendation of the sub-committee in favour of the Tweed scheme for an additional supply of water.

THE death is announced in Paris, at the age of forty years, of M. Geneutte. He had exhibited at the Paris Salon since 1876; his pictures, depicting street scenes in Paris, were evidence of great ability and originality.

PROFESSOR BOYD DAWKINS recently paid a visit to the museum at Tullie House, Carlisle, and examined the extensive collection of Roman remains, some of which turned out to be Celtic, and as they had been dug up in various parts of the city they thus furnish conclusive evidence that Carlisle was a Celtic settlement prior to the Roman occupation. One of the specimens enabled him to decide the process by which the Celts did their enamelling, namely, by fusion and not inlaying.



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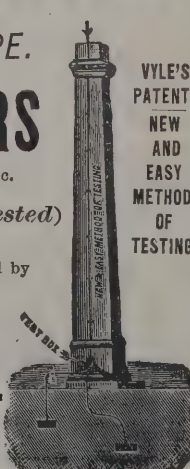
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THE ancient cross of Newton-on-Ayr having been unearthed, a committee of the Town Council are endeavouring to find a suitable site for its re-erection.

THE Swansea Harbour authorities have decided to seek powers during the next session of Parliament to construct a new bridge at a cost of between 25,000*l.* and 30,000*l.*

HARROW-ON-THE-HILL.

THE new Roman Catholic church of "Our Lady and St. Thomas of Canterbury" will be opened on Tuesday, the 16th inst. The small church or chapel which has so long been in use had become inadequate for present purposes. It was determined to build a new church on a different and much more convenient



Dr. Patterson,* Bishop of Emmaus, being present. The church has been designed by Mr. Arthur Young, of 4 Iddesleigh Mansions, the builders being Messrs. Turner & Son, of Watford.

ANTWERP EXHIBITION AWARDS.

IN the list of awards granted to the British exhibitors at the Antwerp Exhibition the following names appear:—

Diplomas and Medals of Honour.—Mr. Alma-Tadema, Sir John Millais, Messrs. Miller & Richard, Atkinson Brothers, Hampton & Sons, Tangyes (Limited), the Lancashire and Yorkshire Railway Company, the London, Chatham and Dover Railway Company, Chubb & Sons, Howard & Sons and F. B. Kent & Sons.

First-class Medals.—Sir Edward Burne-Jones, Mr. Henry Davis and Mr. Henry Moore.

Gold Medals.—Waterlow & Sons, Chubb & Sons and Holland & Holland.

Awards have also been granted to the following:—

Musgrave & Co., Pain & Co., Chubb & Sons, Davis & Co., the Great Eastern Railway Company, the London and South-Western Railway, the Orient Steam Navigation Co., the Royal Mail Steam Packet Co. and the Union Steamship Co.

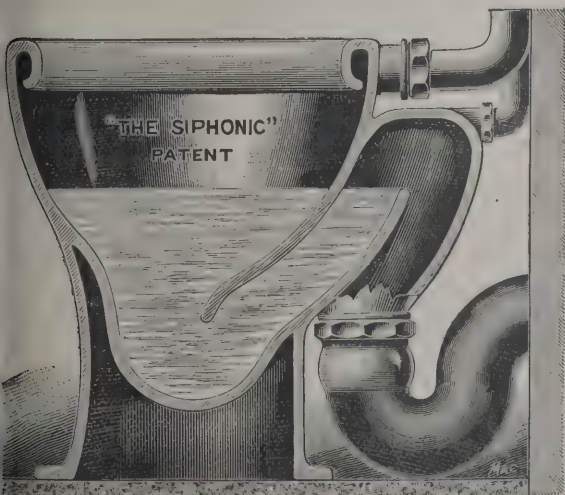
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ILLUSTRATIONS.

THE VICTORIA INSTITUTE, WORCESTER.

LIBRARY BLOCK, ENTRANCE FROM FOREGATE STREET.

LIBRARY BLOCK, VIEW FROM NORTH-EAST.

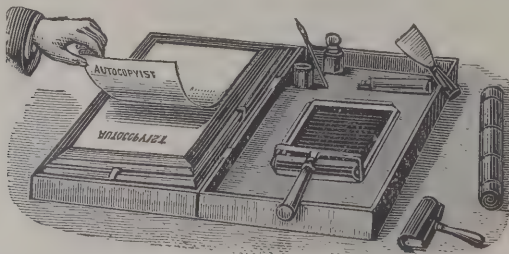
SCHOOLS BLOCK, VIEW FROM SOUTH-WEST.

LIBRARY BLOCK, VIEW FROM SOUTH-WEST.

SCHOOLS BLOCK, VIEW FROM NORTH-EAST.

NOTES ON NOVELTIES.

WE have recently inspected the patent autocopyist now in general use for the reproduction of circulars, plans, sketches, &c. This apparatus, illustrated below, has the unique feature of copying direct from the ordinary pen in clear black lines, so that it is available for general business routine. The autocopyist is supplied with everything complete for instant use, including one dozen sheets of parchment, inks, brushes, &c. The method of using these is as follows:—One of the prepared parchment sheets is moistened with water, fastened down to



the frame, and after placing the original on the parchment for one minute, an absolutely correct negative will at once appear on it. The printing roller is now passed over the negative, which only will take the printing ink, and in its turn render it to the sheets of paper placed upon it, thus producing clear copies of the natural handwriting, &c. with absolute precision, only to be equalled by lithography. By sprinkling special transfer powder prepared by the Autocopyist Company over

the copies they act as fresh originals for many months. We have seen the autocopyist in operation, and can testify to the remarkable expedition with which reproductions are taken, and to the absolute correctness of the facsimiles. Moreover, the autocopyist has stood a practical test of several years, and remains the apparatus most generally used. We should suggest that the autocopyist should find much favour with architects anxious to send out quantities, specifications, &c. as quickly as possible. This method will certainly be much more economical all round than the old one. The address of the manufacturers is the Autocopyist Company, 72 London Wall, London, E.C., and they will be glad to submit specimens of work done by their patent.

JUNIOR ENGINEERING SOCIETY.

THE annual meeting of this Society was held last Friday evening at the Westminster Palace Hotel, Mr. P. J. Waldran in the chair. A satisfactory report of the affairs of the Society was submitted. The number of members is 373, showing a net increase of 13 3 per cent. A tribute was paid to the late Dr. John Tyndall, who showed much interest in the progress of the young engineers. Nine meetings had been held during the session, at which papers dealing with technical subjects were read. The premium for the best paper was awarded to Mr. G. F. Burt (Brighton) for his contribution on "The Design and Construction of Boilers for Locomotive Engines." The presentation will be made at the opening meeting of the new session. Visits to important works had maintained their position as one of the most useful objects of the Society, and the Council expressed their thanks to the various proprietors who had thrown open their works to the members. Among those visited were the Tilbury Docks, the Tower Bridge, the Battersea Polytechnic, Wembley Park Tower and the steamer *La Marguerite*. The summer excursion to Cardiff gave the members an opportunity of viewing the Barry Docks. During the year two Whitworth Exhibitions had been gained by members, Mr. Frank Fisher and J. N. Boot. By invitation of the Technical Education Board of the London County Council delegates were appointed to the conferences held in June and July, to promote technical education in the interest of trades. After the adoption of the report some discussion took place as to the advisability of changing the title of the Society, and it was eventually decided to call it "The Institution of Junior Engineers."

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THE BUILDING TRADE IN GLASGOW.

ON the 4th inst. the retiring Lord Dean of Guild, Sir James King, made the customary annual statement. He said that as that was his last appearance as Lord Dean of Guild, he wished to express the great satisfaction which he found in the important powers possessed by the Court since he first presided there. The powers were purely administrative, but that did not prevent the Dean from bringing before notice in the proper quarter the defects which he found in the powers entrusted to him. During his former term of office they were hampered in many ways, but he found many independent reformers among his colleagues in the Town Council. The building regulations were framed, and by petition to the then Home Secretary, and by other means, they endeavoured to have them carried into effect. The public at that time had not, however, fully awakened to the value of complete and perfect control over the erection of their houses. Still the seed sown very soon ripened into harvest, and through the zeal, energy and tact of Bailie Crawford and Bailie Primrose, aided by the then Dean, his excellent friend the present Sub-Dean, and the Deacon Convener, who stood shoulder to shoulder, many beneficial improvements were made. Eighteen years had passed since last it was his duty to review the business of the Court, and it was now his duty to refer to the work of the past year, although a very small proportion had been done by himself, the greater part having been well and ably done by the late Dean, who, after a long and honourable career, had now entered into his rest. During the two years in which he held office formerly, the extent of the building operations was greatly in excess of all previous or subsequent experience. The estimated total cost of erections and alterations in 1874-75 was 1,826,150*l.*, and in 1875-76 2,125,249*l.* This building craze was followed by a long and severe depression, from which property had even yet only partially recovered. The last few years had shown increased activity and a marked increase in the number of properties, even after making allowance for the proportion due to the extension of boundaries. The increase had been especially large during the last two years, the valuation of operations authorised by the Court having been in the year ending August 31, 1893, 1,330,680*l.*, and in the year just finished 1,275,445*l.* The details of the past year were briefly as follow:—Houses erected of one room, 470; two rooms, 1,519; three rooms, 874; four rooms, 369; five rooms, 89; and six rooms and upwards, 145. The total number of houses erected in the past year was 3,466, and of

shops 123. The estimated cost of the erections was 785,950*l.*; alterations and additions, 241,310*l.*; and public buildings, warehouses, &c., 248,185*l.*—making a total of 1,275,445*l.* In addition twenty-one streets had been authorised, extending to about five miles. The total linings passed was 623, or an average of 26 linings at each meeting of the Court. The number of linings for houses passed in 1894 was greatly in excess of any previous year since 1876, being, as stated above, 3,466, as compared with 2,573 in 1893. The number of houses of six rooms and upwards erected this year was 145, as compared with seventy-nine last year. Nearly the whole of these large houses were erected in outlying districts of the city. The average number of houses erected in the fourteen years from 1877 to 1891 was only 224. They had heard a great deal of life in one-room houses, and it might be interesting to note the relative proportions of small and large houses which were being erected at the present day as compared with the proportions twenty years ago, when he formerly held office. Houses of one room erected in 1875 formed 20 per cent. of the total number of houses built, in 1876 17 per cent., in 1893 13 per cent. and in 1894 13½ per cent. Two-room houses in 1876 formed 47½ per cent. of the whole, in 1876 48½ per cent., in 1893 44 per cent. and in 1894 44 per cent. Three-room houses in 1875 formed 32½ per cent., in 1876 34½ per cent., in 1893 43 per cent. and in 1894 42½ per cent. Small houses were not necessarily unwholesome or the large houses clean and healthy. Sir James King concluded by expressing his deep acknowledgment to his brethren the liners for their valuable assistance and for the amount of time they ungrudgingly bestowed on the work. He was glad to see that Mr. Lang and Mr. Whyte were still discharging with the same intelligence and the same courtesy the important duties which devolved upon them. He also expressed his acknowledgment to the other officials of the court, and thanked the procurators who with the skill and clearness which was characteristic of the profession in Glasgow placed their cases before him, and thus saved much valuable time to the whole of the committee.

BEFORE deciding upon the details of the proposed new Naval Barracks at Chatham, which will be on a somewhat extensive scale, the Lords of the Admiralty will consider a report upon the subject which is being specially prepared at their request. The conversion of the old prison buildings will form only a very small part of the scheme.

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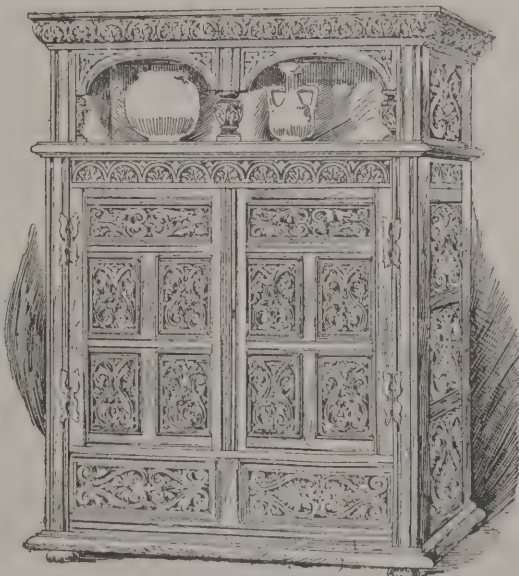
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CAXTON CONVALESCENT HOME.

MORE than four hundred printers and their friends took special train from London Bridge on Saturday afternoon for Oxted, to witness the laying of the foundation-stone of a convalescent home there. They were accompanied by the Lord Mayor and Lady Mayoress, Mr. Sheriff Hand, Mr. and Mrs. Passmore Edwards, Mr. C. J. Drummond, Mr. W. H. Collingridge and others. The weather unfortunately was at times wet, so that the full benefit of a jaunt to one of the loveliest spots in Surrey could not be enjoyed. Oxted Station was only a part of the way. The home, which will be known as the Caxton, is at Limpsfield.

The new home will be situated on one of the finest sites in the kingdom, with views from the front door over a stretch of hill and dale, pasture and woodland, which will be hard to equal anywhere. The building is being erected on the Chartlands Farm Estate, adjoining Limpsfield Common. The site (which with the grounds is about nine acres in extent) is just below the crest of the hill, and is well sheltered from the north and east. The building comprises a two-storeyed block, with returned gabled ends, containing day-rooms, dormitories, &c., for fifty male patients, with one-storeyed extensions in the rear for administrative offices. Advantage has been taken of the quick fall in the ground from north to south to construct a basement at the south end of the main block, to contain, besides large cellarage, a smoking and billiard room, cloak-room and lavatories. The patients' general entrance is also on this floor. Provision is made for the construction in future of a number of additional rooms in the roof of the building to accommodate twenty-two patients. A small bedroom is provided in the tower below the cistern chamber, and above the latter a "sun" room lighted on all sides. The dormitories, when fully occupied, will allow a minimum of 750 cubic feet for each patient, and special care has been taken to secure ample light and ventilation throughout. All rooms are provided with open fires, and the corridors will be heated by low-pressure and hot-water pipes. The external walls generally will be faced with red bricks, relieved with Monk's Park Bath stone dressings, the upper storey being hung with red plain tiles. The roofs will be covered with brindled plain tiles. It is at present proposed to erect the centre portion only of the building, to accommodate twelve patients, and the cost will be defrayed entirely by Mr. J. Passmore Edwards, the

president of the institution. The architect is Mr. A. Saxon Snell.

The ceremony of laying the foundation-stone was performed by the Lord Mayor.

BELGIAN COMPETITION IN IRON AND STEEL.

ONE of the members of the Iron and Steel Institute gives the following account of his experience during the recent meeting in Brussels:—While our coal-mining centres throughout Scotland are engulfed in the very worst possible form of stoppage which can overtake any industry, it may be interesting as well as instructive to show what our continental neighbours in the iron and steel manufactures are doing. Of course, iron and steel production in any country is so inseparably bound up with coal-mining that whatever influences the one is bound to affect the other. The miner has, therefore, largely to thank iron and steel producers for consuming the fuel which his labour raises. Clearly such consumers are amongst his best friends. Without entering into the question of who is to blame for the present national coal strike, with its far-reaching and deadly effects, which no time almost will ever quite efface these very iron and steel manufacturers of our country, along with their workmen, wives, children and other dependents, to say nothing of the countless thousands in other fields of industry, are unfortunately the greatest sufferers, and consequently the innocent victims of the present stagnation in coal production. A terrible responsibility therefore rests on someone's shoulders. As a member of the Iron and Steel Institute of Great Britain I have just returned from taking part in the autumn meeting, which has been held this year in Brussels. In the course of our peregrinations we were not only hospitably entertained everywhere, but we were also accorded the exceptional privilege of visiting and thoroughly inspecting the blast furnaces and iron and steel rolling plant of three of the best establishments in Belgium. I had often heard and read of Belgian and German competition in iron and steel production, but had never the opportunity of seeing it for myself until now, in the former country. I had fondly cherished the belief, which is to my knowledge a common one, that Great Britain holds an unassailable industrial supremacy in the manufacture of iron and steel from the crude ore onwards, due



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to the magnitude of her industries, the size of her blast-furnaces, the power and high speed of her rolling plant, along with the outstanding superiority of her workmen, resulting inevitably in cheaper and better finished products in iron and steel. I am reluctantly compelled to admit that this opinion has received a severe shock from my recent visits to the Belgian iron and steel works. As a practical man, having over twenty years' experience in the iron and steel trades of Scotland, I have no hesitation in saying that our continental neighbours have shot so far ahead within the last few years in iron and steel production, that a condition of matters now exists there which compels our most earnest attention, not only to hold our own, but really to prevent us taking in a very few years from now what is vulgarly, but very tersely, termed a "back seat." The expression exactly conveys the position we are approaching, and I am convinced that it is only by pursuing the paths of industrial peace that we can successfully cope with the intelligent and determined competition directed against us so mercilessly.

I now proceed to state as accurately as possible what we saw at the three iron and steel works we visited, without going too much into technical detail. The first establishment inspected was the works of the limited company, Marcinelle & Couillet, at Couillet, about four hours' run by train from Brussels. These works were established in 1835, and consist of blast-furnaces of the most modern type—there is nothing better to be seen in either England or Scotland—Bessemer department, Siemens furnaces, rolling-mills, &c. On stepping from the special train kindly provided for the members of the Institute the first thing that caught the eye of the expert, next to noting the magnitude of the establishment, was the extreme order that prevailed everywhere. Everything seemed to be in its place, and the stacks of material in the yard were most carefully piled and marked for future reference. A close inspection of the blast-furnaces, blowing-engines and all their auxiliaries called forth nothing but the highest praise on all sides. The works are equipped with the most modern appliances in every detail. The methods are on a par with the plant. We saw a blast-furnace tapped into a ladle. This operation over, the liquid metal was immediately taken to the Bessemer department, and in about twenty minutes converted into steel of a quality suitable for rolling into girders, angles or bars. This is apparently their daily practice, no intermediate process of cupola-melting of pig being used, which must cheapen cost of production very

much. Any experts reading this statement will at once see that we have here the best and most modern practice yet attained in our home industries in full and apparently successful operation in a foreign country which we have scarcely taken time to seriously notice hitherto. From the Bessemer department, with its massive converters and magnificent hydraulic crane plant, working smoothly and noiselessly, as if controlled by some hidden spiritual force, we wended our steps towards the rolling mills department. I was not prepared for the high efficiency of rolling plant that here met our eyes. Mills with three rolls high seem to be more in favour with Belgian engineers than the reversing mills to which we pin our faith in this country. I looked carefully at the engines of their largest rolling mill—there were four mills in all—and I am compelled to admit that I never looked upon engines that conveyed a greater impression of power. The engines consisted of three high-pressed cylinders, about 50 inches in diameter each, and connected to a three-throw crank shaft, from which the large mill was driven direct without gearing at an enormous speed. It was quite a treat to see these Belgians take an ingot of steel and roll it off in one operation into a finished girder 12 inches by 6 inches, and in lengths of 70 to 80 feet. It was difficult for a moment to resist the impression that instead of being in a foreign country we were watching the operation in Middlesbrough, or some other British manufacturing centre. The girders when finished were beautifully straight, and the material itself had all the appearance of good quality. It is unnecessary to say anything more of the other, and smaller, mills, which were all busily employed in rolling ordinary round and flat bars after the manner of our own practice and in every way as efficiently. The Belgian iron and steel worker is apparently a smart fellow, amenable to discipline and of fairly good physique. He is more contented than his English prototype, and works longer hours for less wages, seems to be happy and bears no evidences of dissipation. Before leaving Couillet Works I may mention that 6,000 hands are employed in the coal mines, blast-furnaces and iron and steel works, and the yearly production is stated to be 150,000 tons of steel. While writing I have before me a small pamphlet which was presented to us while at the works, containing a note and a short history of the workmen's institutions in connection with this immense establishment. It is most interesting reading. It begins with the "Construction in 1836 of the first group of houses to workmen;" "Establishment of insurance fund against accidents and old age;" "Organisation

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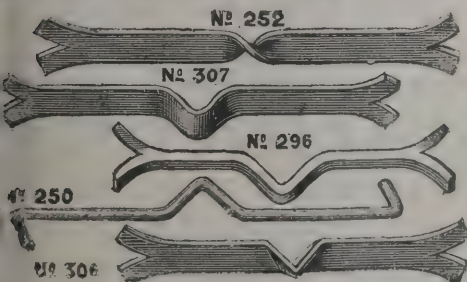
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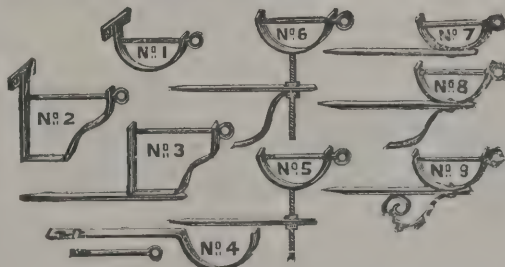
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of the medical service." 1847. "Construction of the hospital of Couillet;" then follows infant school, drawing school, elementary school, music school and music band; subsidy to a school for adults; construction of houses for the account of workmen; distribution of suppers to the men; distribution of flour at cost price to the men and establishment of a bakery; establishment of a housewifery school; establishment of a savings bank in 1875." This is the last event recorded, and a very good finish it is. It thus becomes apparent that Belgian employers regard it as a part of their duty to see to the comfort and well-being of their workers, apart from actual work, and to provide amusement as well as instruction. These must be all-powerful influences for peace and goodwill amongst employers and men, the whole tending towards one happy family and rooting the workers to the soil, on which they apparently live and die. So far as I could learn disputes are few and strikes are rare.

On the following day we visited in the early part of the day the works of the Angleur Steel Company at Liège, where we saw another highly efficient plant on a somewhat lesser scale, although not so very much behind that at Couillet. In the afternoon we went to the greatest establishment of all, the works of the Cockerill Company at Seraing. The immensity of this place beggars description. It comprises blast-furnaces, rolling-mills, foundries, workshops, artillery and shipbuilding departments, &c.—too much, in fact, to take in all at once, yet harmony and order apparently prevail everywhere. "Courage to the last" is the heraldic motto over their establishment, and it will assuredly be required in handling this leviathan iron, coal and steel producing work. The same order, neatness and working expertness were all doubly emphasised here, and I left Belgium and the three beforementioned works with a strong impression that they are not only difficult to excel, but that if we do not keep our weather eye open in our manufacturing centres in Great Britain we shall eventually be beaten in the struggle for supremacy in the iron and steel trades. The close connection between the coal-mining and the iron and steel industries appears from the fact that it takes not very far short of four tons of coal to make one ton of finished iron or steel, counting from the time the ore enters the blast-furnace until it reaches the finished state. Our continental neighbours can produce even more cheaply than our home manufacturers. This has received confirmation since my return, as I have learned of a repeat order of 5,000 tons of finished steel for a foreign house having been placed with German manu-

facturers by a Scotch merchant of long standing at such a price as could not be looked at in either England or Scotland. I may also mention that I was informed by a Belgian merchant that he was delivering steel boiler plates into Italy, orders which used to come to the West of Scotland. It is thus apparent that we are losing our trade in foreign markets for iron and steel, and that the industrious and contented Belgians and Germans are quietly but surely securing it. I said foreign trade, but this must be qualified. Let us look around in our own city, in London and elsewhere, and note the vast amount of steel and iron in the form of girders which now enters into the construction of all modern buildings. Where do all these girders come from? Why, from Belgium. The imports of other forms of rolled material, such as tramway rails, sheets, bars, &c. are undoubtedly on the increase. But enough has been said to show that the position has become sufficiently alarming, and I hope the intelligent iron and steel-workers and miners will realise the situation. A shrinkage in our iron and steel production through successful foreign competition means a lessened demand for coal, which simply means less work and lower wages for the miners. Is there no way in which this deadly competition can be met? Yes, there is yet a ray of hope. Coal abundant in supply and cheap in price is the key to the position. Strikes and lock-outs and all such barbarous methods must for ever cease, and that with the least possible delay, unless capital is to be extinguished and labour go a-begging. Do the miners for one moment suppose that the masters are not as sick and sorry over the past twelve weeks of idleness as they are, and the bigger losers of the two? There is still enough of brain and muscle power and technical skill and capital left to successfully compete with the foreigner both at home and abroad, but these must all be industriously applied in the right direction. From what I have recently seen in Belgium, I would advise the Scotch miners to take warning and return to their work without delay. Let it be understood thoroughly by the miners that large profits in manufactures are not made nowadays, and that it is only by the large output that concerns can live and return a fair profit. The labour of the miner is not exempt from the same law. He must work six days per week and make a good wage by output. Restricting output and artificially raising the price of fuel can only end disastrously for all concerned, and not the least pernicious of its effects is seen in the success of our foreign competitors.

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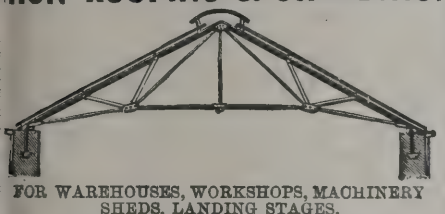
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PUDDLED IRON AND STEEL INGOTS.

THE first meeting of the session of the South Staffordshire Institute of Iron and Steel Works' Managers has been held at the Institute, Dudley. Mr. Thomas Ashton, manager, Netherton Ironworks, delivered the presidential address. He remarked that it was a matter for mutual congratulation that they were commencing another session under such favourable auspices, each department of their work presenting satisfactory evidence of the stability, prosperity and progressive character of their Institute. The iron and steel trades were now passing through a transition more serious than had ever before been experienced; not the natural and healthy transition of youth to stronger and more fully-developed conditions, but one containing elements of danger to the healthy supremacy, if not to the very existence, of iron-making by the long-existing process of manual puddling. Ever since the introduction of steel and iron making by the Bessemer, basic and open-hearth processes a steady and continuous inroad had been made upon the domain where for nearly one hundred years puddled iron had held undisputed sway. The advance, which at the outset was comparatively slow, had during the last few years quickened into a formidable attack, the advancing force hoisting its flag and permanently annexing many districts seized and points of advantage gained in its onward and triumphant march. That these statements were not mere figures of speech introduced to round a period was sternly demonstrated by the statistics recently issued by the British Iron Trade Association, and which had accentuated the fears long existing in the minds of puddled iron-makers that ingot-iron might displace weld-iron made by the puddling process. In 1882, 2,841,534 tons of puddled bars were introduced, against 1,363,974 tons in 1892, representing a decrease of more than 50 per cent. On the other hand, the production of open-hearth ingots increased during the same period from 436,000 tons to 1,400,000, an increase of nearly 1,000,000 tons. With those figures before them, the important question for them to consider was whether puddled or weld-iron was doomed, or was it being driven into a much restricted and limited area, where, by its own inherent and specific qualities, it could successfully prevent any further advance of its formidable antagonist? In other words, would there permanently exist any special purpose for which weldable fibrous iron was better adapted than rigid homogeneous iron? They believed such was the case, notwithstanding the persistent and not altogether dis-

interested attacks upon iron by a certain class of steel-makers. Given a basis of suitable materials, of which there remained practically unlimited stores, skilfully manipulated through the various processes of manufacture, a more uniform and reliable metal could be obtained by the puddling process for every requirement where a ductile, weldable material was essential, than by any known process of steel-making. The results of exhaustive experiments, made by various engineers, had conclusively proved that the ultimate strength of steel was less than that of iron when both had been subjected to a succession of equal heats in order to manipulate them into any required form or shape. For this reason a marked reaction had taken place in favour of a high class of iron for engineering and locomotive work. A case had recently come to his knowledge where a railway company, after a lengthened and thorough trial of steel gearing and couplings, abandoned them, finding that they were not to be relied on, and refitted the whole of their rolling-stock with others made of iron. The results of tests of Staffordshire iron taken from the bar in its normal condition, and of the same iron after being made into chain, proved that it was not yet played out, the results showing that the samples of iron so tested contained the chief virtues of steel without its vices, and in addition possessed high valuable welding properties not to be found in steel. The destruction tests showed an average of more than 120 per cent. over Admiralty requirements, thus clearly proving the strength and perfection of the various welds. In addition, it was well known to metallurgical experts that in casting steel ingots the impurities were not uniformly distributed through the metal, but segregated and settled in some part of the ingot, causing what were locally known as pipe-holes, which, as the purer metal contracted in cooling, left it, thus forming a cavity, in which was secreted an element of weakness and danger that invariably passed unobserved through subsequent workings of the ingot, only to be discovered when, under the strain of actual work, the defective bar or plate suddenly failed, to the chagrin and loss of the user. But while iron of a high-class quality might and would be preferred to steel for purposes already referred to, yet for heavy sections used for structural work, or when a hard resisting surface was required, as in the case of rails, &c., steel had very largely displaced iron. The effect of this displacement was seen in the stoppage of so many ironworks throughout the country, and ironmakers of world-wide renown had had to succumb to the loss of trade in consequence. One effect

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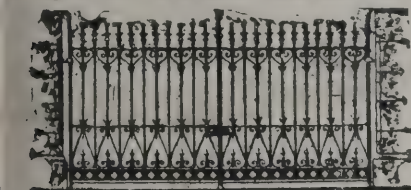
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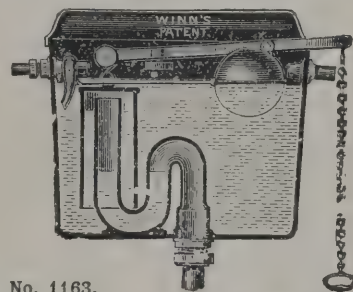
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of the competition of steel had been to awaken those ironmasters who had survived the onslaught to the necessity of improving their machinery and appliances, so that by a more economical production of a higher class of iron they might retain that portion of their trade for which iron was now proved to be best adapted. The remnant trade for iron would undoubtedly fall into the hands of those makers who could most economically and efficiently produce the class of iron required. Whilst admitting that the outlook for the iron trade was sufficiently serious, yet it was far from being *in extremis*, and if manufacturers and workmen bated not heart, hope, or effort iron would for many years to come be one of the staple trades of the district. He advocated the relegation of all wages and labour questions to the humane and intelligent arbitrament of equitably-constituted conciliation boards. The long decade of trade depression was slowly, yet surely, passing away, and in the not very distant future—probably in the coming year—the favouring causes observable in the chief trade centres of the world, together with the bountiful harvest of our own land, would culminate in a steady and substantial revival in every branch of trade and commerce. Such hopeful and brightening prospects were most encouraging, and foreshadowed a return to the activity and prosperity of former days, a desideratum which would nowhere be more heartily welcomed than in their own immediate district, where the cloud of depression had so long existed.

Mr. W. B. Rubery, in opening a short discussion, said that the nearest approach to good weldable iron that he had seen had been a combination of iron and steel, and he did not think they need fear the entire absence of iron making in that district. It was, no doubt, a serious thing that there was such a large falling off in the manufacture of iron, but they must not forget that they were the advocates of both iron and steel, and where the former failed they must be prepared to supply the demand for the latter.

Mr. G. Williams believed that for general purposes iron would continue to hold its own. For constructive purposes steel was lighter, but it required a very free use of the paint brush, as was shown by the experiences in connection with the Forth Bridge.

Mr. Edwards said that experience had shown that steel, when subjected to the various processes of welding, was not at all times uniform, which was one of its most serious drawbacks. On the other hand, good iron could always be relied upon for welding purposes, and it was satisfactory to know that South Staffordshire, in spite of all the new processes brought forward, had maintained its name and fame for iron of a high-class quality.

In proposing a vote of thanks to the President for his address, Mr. J. Roberts said it was perfectly true that steel was liable to many failures, especially when used for welding purposes, but possibly the users of steel were quite as much to blame for this as the makers of it. In the first place, in order to avoid these failures, the users of steel should distinctly indicate to the makers that they required it for welding purposes, as there was a very great difference in the quality of steel manufactured specially for welding and that for ordinary constructive purposes. There was also to be observed a distinct difference in the manner of welding. In South Staffordshire they had as good smiths as were to be found anywhere in the world, but it frequently happened that failures of steel when used for welding purposes could be traced to defective workmanship and not to the segregation referred to by the president. They could not maintain the structural trades of the district unless they had good and cheap steel; and whilst it was necessary that manufacturers of steel should realise the importance of making it thoroughly reliable, it was also necessary that users should clearly specify what they required it for, and also that the smiths should take great care in manipulating it during the processes of welding. It was quite true that steel when exposed more readily oxidised than wrought-iron, but so far as the Forth Bridge was concerned, he believed that as much paint would have been required if it had been constructed of the latter metal.

NEW THEATRE, WAKEFIELD.

A NEW building, which is to be known as the Royal Opera House, has been erected on the site of the old Theatre Royal, in Westgate, Wakefield. It has been erected from plans prepared by Mr. Frank Matcham, of London. The various works are on the point of completion, and it had been announced that the new theatre would be opened on Monday last. The opening day has been deferred, however, by the general purposes committee of the West Riding County Council for three weeks. Mr. Sherwood, the owner, applied at the adjourned Brewster Sessions for the city for the renewal of the Excise license he held in connection with the old theatre, and the application was adjourned. An application was also made to the general purposes committee of the West Riding County Council sitting

at Wakefield Town Hall, for a license to perform stage plays in the new building. It was said that the new building was a great credit to Wakefield and also to Mr. Sherwood, who had shown much enterprise, and unless a theatrical license was granted the expenditure would be in a very great measure thrown away. Discussion took place on the application, and it was evident that some of the committee appeared opposed to intoxicating liquors being sold in the new theatre, although Mr. Sherwood held an Excise license for the old theatre. There was also a feeling on the part of many of the committee that it would be unsafe to open the theatre, as the plastering and other work has only just been completed. It was explained that the plasterwork had been stoved and dried in London prior to being sent to Wakefield for fixing, and that artificial heat had been in constant use by day and night for some time. After the committee had consulted in private for some time they granted the license on condition that the theatre is not opened for three weeks.

THIRLMERE WATERWORKS ARBITRATION.

THE evidence for Lord Lonsdale in the arbitration between his lordship and the Manchester Corporation has been concluded. The case, which is being heard by Mr. C. Oakley as arbitrator, arises out of claims on account of wayleave for the conduits, stone employed and injury to the property. Two sums of 7,160*l.* and 5,760*l.* are in question.

Mr. Bintley, surveyor of Kendal, gave evidence about the manner in which he calculated the sums claimed.

In cross-examination he said that the calculations he had made were based upon the assumption that all the stone taken in the course of the construction of the aqueduct was the property of the Earl of Lonsdale. He made out that the total quantity of rock and material used by the Corporation for concrete was 66,581 cubic yards, and the quantity used for building purposes was 1,796 yards. These figures were the result of his measurements of the works, and were not the result of measuring or weighing of the material as it was used. The figures he had given related to the manorial claim. With regard to the properties affected by the notice to treat, the total amount of rock used in the works on those properties was 16,799 cubic yards for concrete and 295 cubic yards for building. He was not aware that the original claim under the manorial claim was with respect to twenty-three miles, nor did he know how much had been struck out, but he understood that the total now was for eighteen miles. Witness first made a valuation about a year ago, and that valuation was more than 5,760*l.*, the amount of the present manorial claim. He was not aware that a year ago Lord Lonsdale made a claim with regard to twenty-three miles, which amounted to a total of 4,500*l.* He thought it was since that claim was made that witness had added to the manorial claim the sum of 1,800*l.* for wayleave. He had made that addition within the last few days, after a general discussion among Lord Lonsdale's advisers. Witness certainly thought that without that 1,800*l.* the amount claimed was not sufficient. Deducting the 1,800*l.* from the amount of the present claim, there remained 3,960*l.* for the minerals over eighteen miles, which was about the same as 4,500*l.* for twenty-three miles. He believed it was true that there was no mention of wayleave or easement in the original claim. He could not say who first made the suggestion that 1,800*l.* should be added for wayleave. He had not considered that there was any part of the course of the aqueduct where it passed through solid soil where there were no minerals. But if there were such portions, he considered that Lord Lonsdale owned whatever was beneath the surface, whether minerals or soil. Witness had on more than one occasion collected royalties for Lord Lonsdale for stone taken out of the ground, apart from slate. In the cases where slate was got the stone which was taken out in the process of slate-getting generally went to spoil as of no value. But thousands of yards of stone had been sold at prices ranging from 3*d.* to 2*s.* per cubic yard, according to the nature of the stone. At Spital 4*d.* to 6*d.* per yard was paid by the County Council for stone unquarried for road-stone, and at other places 6*d.* and upwards was paid. He did not think that any of the stone taken out of the Manchester Waterworks tunnels had been used for road purposes. He was not aware that one of the contractors undertook to keep the roads in repair with this stone, and that the experiment was not satisfactory. If that had been done, it was before the roads came under the control of the County Council. It was true that in some cases where 2*s.* to 3*s.* per yard was paid for road-stone it was for stone collected by the farmers from their fields and brought to the roadside, and the cost of haulage was included in the cost. The embankment made in the Spital property by the works formed part of the field, and was not in any way fenced. The total height of the embankment was about 10 feet. He had put down as damage for the embankment 3*s.* per running yard. Where the aqueduct was carried in pipes under the ground he had charged 2*s.* per yard. He certainly considered that the land was seriously injured by

the laying of the pipes, and would be worse for purposes of cultivation for fifty years to come. Even if there was 2 feet 6 inches of soil above the pipes and the work had been properly executed, he did not think that the land would be as good for farming purposes. He considered that the rental value of the Spital Farm was considerably reduced as the result of the waterworks. He did not know of any place on Lord Lonsdale's estates where people were allowed to take stone without payment. He considered that when land was covered by spoil it was of very little value, but he was not prepared to say that he would charge quite the full value of the land when it was used for spoil purposes. He was not aware that in any case the full value of the land had been claimed. He was not aware that in some instances where the full value of the land was 50*l.* per acre, 80*l.* per acre had been claimed for injury to the land from putting the spoil on it. He did not know what was the value of the land used for spoil. In estimating the damage from the placing of air-valves he had charged not only for the one that had already been placed in the land, but for the four others that would eventually be placed there. So far as he knew, the Manchester Corporation might exercise their rights to place the remaining air-valves to-morrow. Wherever the aqueduct was "cut and cover" or tunnel all the air-valves were already put in; it was only where pipes were used that the air-valves remained to be put in in the future.

Re-examined: Even supposing the value of the whole farm was 50*l.* per acre, it was not likely that Lord Lonsdale would sell the five separate small pieces of land in the best part of the farm which had been used for spoil beds at anything like 50*l.* per acre. With regard to the quantity of stone used for the concrete, he had made his calculation with great care after spending some three weeks in measuring and inspecting the work. His calculation was based on the concrete having an average thickness of 18 inches, but there were many places where the thickness was 3 feet. As to the value of the stone taken out of the tunnels, he considered that it was quite worth 1*s.* per cubic yard for the purpose for which it was used by the Manchester Corporation. So far as Dunmail Raise was concerned, where the tunnel was some 260 feet below the surface, he considered that the whole hill was worth 2*d.* per cubic yard, and he did not think Lord Lonsdale would sell it for less.

Mr. Balfour Browne: I fancy Lord Lonsdale's successor would be a poor man if he had to pay death duties on any such basis.

Witness in further re-examination said that there were many stone quarries on Lord Lonsdale's estate, and of course the stone taken from the quarries was all paid for. If the Manchester Corporation had not found this stone on the site of their works they would have had to buy it from someone and would have been put to great cost for cartage as well. He did not see, therefore, why they should have the material for nothing because it happened to be on the site of the works. He knew as a fact that the stone from one of the spoil banks on the land of Mr. Dunlop was now being sold at 4*d.* per cubic yard or 2*d.* per yard more than Lord Lonsdale was claiming from the Corporation for stone placed on the spoil banks.

Mr. James Hudson, land agent, Penrith, said that he was land agent to the Lonsdale estates. He had had considerable experience in the valuation of land and of wayleaves in Cumberland and Westmorland. He had made a careful survey of the waterworks as they passed through the Lonsdale estates and an estimate of the value of the easement. He valued the easement in the case of the tunnel at 4½*d.* per lineal yard, and in the case of the "cut and cover" at 9*d.* per yard, because the surface was disturbed, and he calculated the sum at the rate of twenty-five years' purchase. He had also valued the stone used for concrete and building purposes at 1*s.* per cubic yard, and the stone put on the spoil banks at 2*d.* per yard. With regard to the Spital Farm property, he certainly considered that it had a value as prospective building land, and the carrying of the aqueduct through the property had the effect of seriously depreciating the value of the property for building purposes. He therefore valued the easement through this property at 2*s.* per lineal yard. In the case of the Hulton Roof Farm he valued the easement at 1*s.* per yard because it reduced the letting value of the property for farming purposes. He considered that 80*l.* per acre was a fair charge for the use of the land as spoil banks. The total of his valuation for the properties under the notice to treat was 7,149*l.* As to the manorial claim, his valuation agreed in the main with that of Mr. Bintley. He estimated the value of the stone used at 1*s.* per yard and the stone put on the spoil banks at 2*d.* per yard. The total for minerals was 3,943*l.* He also considered that Lord Lonsdale as owner of the minerals in these manorial properties was entitled to some payment for the disturbance of the minerals, and he thought 100*l.* per mile was a reasonable price under this head. This made the total amount under the manorial claim 5,743*l.*, and the total under both claims 12,893*l.* His experience of wayleaves had been that for minerals the charge was usually per ton, and for water the charge was generally so much per yard run. In this case the charge of

100*l.* per mile represented 1*s.* 2*d.* per yard, and he thought that was a mere acknowledgment, and the charge could not well be less.

Cross-examined by Mr. Balfour Browne: He did not consider that the proper measure of the value of the wayleave was the actual damage to the property. Of course in the case of a tunnel 250 feet under the surface it was not possible to say that there was any actual damage to the land. In the case of "cut and cover," however, where the surface of the land was disturbed there was a permanent deterioration in the value of the property, even though the soil was replaced and the work properly done. It would take a great number of years for the land to resume its natural state. He had had experience of this deterioration in the value of the land in the case of the Hulton Roof Farm. Previous to last year the rental of that farm of 38½ acres was 336*l.* 12*s.* per annum, but they had been unable to get more than 280*l.* per annum on the lease falling in last year. No doubt there had been a reduction in the value of land generally, but there had been no case on the Lonsdale estates where there had been so heavy a reduction as in the case of Hulton Roof Farm. Besides, the tenant distinctly said that the farm had been deteriorated in value from the aqueduct being carried through it. As to the value of the stone, witness was aware that in 1876 he was arbitrator in a case in which the parish authorities had quarried stone for building purposes without permission, and witness awarded a sum of 27*l.* 1*s.* to the owner of the stone, that figure working out at about threepence per cartload for the quantity taken.

Re-examined: That would mean about 8*d.* per cubic yard, and the quarry from which the stone was taken at Lazenby was a considerable distance from the market. There was another instance at Lazenby, where the Midland Railway Company took a quantity of stone from land belonging to Sir R. Musgrave, and after litigation had to pay a large sum of money. He certainly considered that the carrying of this aqueduct through the property might seriously interfere with subsequent working of the minerals, and he had taken this into account in estimating the value of the wayleave.

In reply to the arbitrator, witness said that in most cases the lord of the manor had the right to enter and take the minerals whenever he liked, giving the tenant compensation. That right was expressly reserved in most of the enfranchisements, but in the case of some of the customary tenures it was a question whether the lord of the manor had the absolute right. Witness was not aware of any instance in which Lord Lonsdale had exercised this right.

Mr. John Holmes, architect and surveyor, Milnthorpe, said that he had a long experience in connection with the valuation of land in Cumberland and Westmorland, having the advantage also of being a member of the assessment committee for the county of Westmorland. He knew the properties which were the subject of the present inquiry, and had carefully gone over them and the waterworks with a view of estimating the effect of those works on the letting value of the properties and on the estate generally, and the figures he had arrived at were very nearly the same as those of the last two witnesses.

Mr. Balfour Browne said that he was prepared to admit the general accuracy of the figures as to the quantities of stone taken and the extent of the works, but of course he did not admit anything as to the prices on which the claim was made up.

The witness then gave the details of his calculations. He considered that the land over the cut and cover portions of the aqueduct was permanently deteriorated, and he maintained also that the prices of 1*s.* per cubic yard for the stone used and 2*d.* per yard for the stone put upon the spoil banks were moderate and fair. With regard to the Spital property, it was situated near to the town of Kendal, which at present was extending in its direction, and there was therefore a good prospect of the Spital property being required for building purposes within a short time. He had taken this fact into consideration in estimating the injury to that property, his figures being almost the same as those of the previous witnesses. With regard to the spoil banks at the Hulton Roof property, he agreed with the other witnesses in estimating the damage to the land at 80*l.* per acre. It was a very different question, taking five or six acres in the middle of a farm and using it for spoil purposes, to buying a piece of property as a whole. The spoil banks themselves would be almost valueless as land for cultivation for many years, and in all probability it would never be as good land as it was before the spoil was put there. With regard to the manorial claim, he agreed with the figures already given as to the value of the stone taken, and he also considered that 100*l.* per mile was a very reasonable sum to ask for the wayleave through this property, having regard to the fact that the property was not the absolute property of Lord Lonsdale, but that he had manorial rights only.

Cross-examined by Mr. Balfour Browne: His estimate made on Sept. 12 showed a total of 8,800*l.*, but it did not contain any charge for unused stone nor any mention of

wayleave through the manorial properties. With regard to his estimate of the value of the wayleave for the tunnel under the property at Dunmail Raise, he had not taken into account in estimating it the value of the land over the tunnel, and he had no idea what was the value per acre of that land. He had, however, reckoned the easement in the case of the tunnel at 4d. per yard, and in the case of the cut and cover at 8d. per yard. According to that, it would seem that the deterioration of the land in the case of the cut and cover as compared with the tunnel was equal to 20l. per acre per annum, but of course in that calculation he took into account the fact that the Corporation in the case of the cut and cover acquired a right of access to the surface of the ground.

Mr. Frederick Puncher, land agent and surveyor, Kirkby Lonsdale, said that he had been for twenty years resident agent for the Bective estates in Cumberland and Westmorland, and had great experience in the valuation of properties. In several instances he had acted as umpire or arbitrator in cases where claims for compensation were made against the Manchester Corporation in connection with the Thirlmere scheme. He knew well the properties of Lord Lonsdale through which the aqueduct passed, and had made a careful valuation of the charge that ought to be made for injury to the property by the works. With some small differences in detail, his calculation worked out at about the same total as that given by the previous witnesses.

Mr. George Storey, land agent to the Earl of Abingdon's Lancashire estates, gave his estimate of the injury to the property and of the value of the wayleave, his figures being practically the same as those given by the previous witnesses.

In cross-examination, the witness said in estimating the value of the stone he should take into consideration the purpose for which the stone was wanted as well as the quality of the stone. He was not aware that Westmorland and Cumberland stone was so bad that large quantities of stone were constantly being brought from Northumberland and elsewhere for building purposes. In re-examination he said that in estimating what should be paid for easement he had taken into consideration the fact that the Manchester Corporation had the right of access to the land for the purpose of repairing the aqueduct. This was a serious detriment to the property, and would reduce its rental value.

Mr. Thomas Fenwick, agent to Lord Cadogan's estates, supported the estimates already given of the value of the wayleave through Lord Lonsdale's property, and the value of

the stone and material taken from the ground. He had considered the question from the point of view of what would be the price as between a willing purchaser and a willing seller, and he had also taken into account the particular purpose for which the land was taken. Cross-examined: No doubt the result was that the amount was greater than the actual injury that was done to Lord Lonsdale's property. He agreed that in that part where the aqueduct was in tunnel the actual injury to the property would be very slight, and would be simply the probable interference with other mining operations. But he thought he was entitled to take into account the fact that there were other towns besides Manchester to which it would be a great advantage to obtain a supply of water from Thirlmere, and that this considerably increased the value of a wayleave beyond the actual injury done to the property. There was no other line by which pipes could be carried southwards except by passing through Lord Lonsdale's property, and he had regarded this as one element in fixing the value of the wayleave.

Re-examined: He certainly thought that besides paying for the right of going through the land the Corporation ought also to pay for the material they took out of the tunnel, when that material was a valuable mineral. For instance, if they had come across a valuable bed of coal and had taken out a few thousand tons he certainly thought they ought to have paid for it. His estimate of the value of the wayleave might have been made on the basis of including everything—the minerals taken out as well—but he had not made his calculation on that basis. If it had turned out that the material extracted was of no value, he should not have considered that the Corporation ought to pay anything, but the stone had been of great value to them. If they had had to bring the material from outside it would have cost them 5s a cubic yard, instead of 1s a yard which they had been charged by Lord Lonsdale. He did not know as a fact that there were other valuable minerals in Dunmail Raise, the working of which would be interfered with by the carrying through of the tunnel, but he had considered that there was a possibility of that being the case and that had formed another element in his calculation.

Mr. Richard Hassard, civil engineer, said he had had great experience in waterworks engineering. He had an intimate acquaintance with the Lake District, and was the originator some years ago of a scheme for providing London and other large towns with a water supply from the Lakes—principally Thirlmere and Ulleswater. The aqueduct would of necessity have had to pass through Lord Lonsdale's property. If Man-

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chester had not prepared the Thirlmere scheme a similar scheme might with great advantage have been framed by a syndicate of other manufacturing towns in Lancashire and Yorkshire, in which case also the line of aqueduct would have had to come through Lord Lonsdale's estate. As to the principle on which payment should be made for wayleave in cases of this kind, he thought that the value of that wayleave to the persons acquiring it ought to be taken into consideration in fixing the compensation paid to owners of private property.

Cross-examined: The estimated cost of the scheme which he had described was 18,000,000 $\frac{1}{2}$, which was not more for the London of to-day than was the cost of the New River scheme for the London of the time when that scheme was carried into effect. Witness had not been called as a witness against the Manchester Thirlmere scheme, and had never condemned it; in fact, he always considered it a fine scheme. He considered, however, that the Manchester scheme could not get any more than 50,000,000 gallons per day; that was the limit of the water that could be got by it. If they banked up Thirlmere Lake 15 or 20 feet higher than they had done they would not get any more water. He had not gone into the question of the cost of the Thirlmere scheme to Manchester, but he understood it was a very advantageous scheme for Manchester. He was not aware that for the smaller supply of 10,000,000 gallons per day, as at present, the cost to Manchester was something like 6s. 8d. per 1,000 gallons; but, if it were so, he supposed Manchester would charge 10s. per 1,000. He was aware that the average cost of water in the North of England and the Midlands was 6d. to 1s. per 1,000 gallons. He knew that Liverpool and Birmingham had since the date of his scheme gone to Wales for their water supply. He did not know that there was any large town in Lancashire that was without good water supply, but there was a very different state of affairs at the date of his scheme, 1869. He was aware that there was a clause in the Manchester Bill which empowered other towns on the line of supply to obtain water from the Manchester aqueduct after Manchester had taken enough for itself.

Re-examined: Many of the large towns of Lancashire had been to Parliament with waterworks schemes since 1869. He considered that the engineer of the Thirlmere scheme had adopted the best route for the aqueduct; practically there could be no deviation of importance, and the line must in any event have passed through Lord Lonsdale's estate.

Mr. William Grisenthwaite, builder and contractor, said that he had carried out large contracts for buildings and water-

works in Cumberland and Westmorland. He had tendered for the construction of the embankment at Thirlmere and for one of the tunnels for the aqueduct. He was therefore well acquainted with work of that kind. He had gone over the works passing through Lord Lonsdale's estate, and he agreed that the estimate of 1s. per yard for the stone used in the concrete was a fair figure, that price being the price per cubic yard when made up in the concrete, deducting one-sixth for the cement. He also thought 1s. per cubic yard for the stone used for building was a fair price. He said this as the result of his own experience in buying and selling stone of a similar kind. As to the stone thrown on the spoil-banks, as that had not the same commercial value he considered 2d. per cubic yard was a proper price.

Cross-examined: He had built houses out of the very same kind of stone as that taken out of the tunnels by the Manchester Corporation, but in some cases the facing stone for houses that he had built was brought from a distance. He had not used stone taken from a great depth for building purposes, but he did not know that such stone was of very inferior quality and could not be worked. There was an unlimited quantity of this kind of stone in the district. He had paid as much as 5s. a cartload for stone of this kind for building purposes, but that price included the cost of quarrying and cartage for four miles. He had known instances where the waste from the quarries had been sold, when it happened that there was a market for it. He had himself rented a quarry at Lake Side and had got good building stone from it. He had bought stone for making concrete and had paid 1s. per yard for it. He had known this stone used for road-making and he knew that some portions of it would go to mush after frost if there were any heavy traffic. Other portions were good for road-making; the quality of the stone varied considerably. He had been about the district all the time the work was going on, and he had seen the stone many times as it was brought out of the tunnels, and he knew that it was mostly good stone.

Re-examined: So far as he could see, all of the stone that came out of the tunnels was good enough for making concrete, and some of it was good enough for building purposes. There were certain free quarries on the estate to which anyone living on the estate could go and take stone without payment, but strangers from other parts would not be allowed to take stone. Witness had bought stone from Mr. Jackson, one of Lord Lonsdale's tenants who had a quarry, and had paid 5s. a cartload, including haulage, equal to 10s. per cubic yard.

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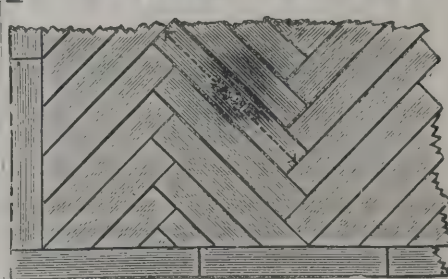
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Windermere Church
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By the Arbitrator: The actual cost of quarrying the stone would be about 1s. per cartload, or 2s. per cubic yard.

Mr. John Norman Dickinson, land agent and surveyor, said that he had considerable experience in settling wayleaves for water pipes in various districts of Cumberland and Westmorland. In settling the amount to be paid for wayleave he took into account not only the damage to the surface of the property, but the value of the wayleave to the person to whom it was granted. Adopting that principle, he had considered the figures that had been given by previous witnesses. He had taken the capacity of the aqueduct, and according to his experience in other cases he believed the claim made for wayleave was a reasonable one.

Cross-examined: He had taken the capacity of the water pipes and had compared it with 15-inch pipes that he had dealt with in cases that had come within his experience, and he had estimated the charge for easement accordingly. He did not look at the question merely as one of damage to the property, but also as to the advantage that accrued from the person who had the wayleave. Suppose the case where a company or a person having the wayleave for a 15-inch pipe should make a profit of 10 per cent. and the company or person with a much larger pipe made a loss; how, then, would you estimate the payment for the wayleave?—Witness: I could not know whether a profit or a loss would be made until the pipes were laid and the works completed. But take the case where the arbitration took place long after the pipes were laid, as in the present case, and suppose it was known that the profit was made in the one case and the loss in the other, how would you estimate the payment for the wayleave?—I do not know. Take another case where a large number of small pipes were carried through with less capacity than one large pipe, but occupying far greater space. Would not your principle of relative capacity break down?—I don't know that it would.

Re-examined: Witness naturally concluded that the Manchester Corporation in carrying out this scheme had an idea that it would be a benefit to them, and that they were not undertaking the work for the fun of the thing. He understood also that the question to be decided related to the date when the pipes were laid and the wayleave taken, when it was not possible for anyone to say whether there would be a profit or a loss from the works.

By the Arbitrator: The wayleave for the 15-inch pipe to which he had referred was valued at 1d. per yard per annum, or at twenty-five years' purchase 2s. 1d. Witness had actually

paid that price for such a wayleave in the case of several local boards.

This concluded the case for the claimant, and the inquiry was adjourned to November 1, when the case of the Manchester Corporation will be commenced.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 18105. Charles Reid, for "Improved safety window."
- 18117. Frederick Garon, senr., for "Jointing lead or soft-met 1 pipes and other plumbers' pipes."
- 18126. Joseph Hall, for "Improvements in jointing stone-ware and other pipes, and in moulds for making the joints."
- 18178. Alfred Richard Fairer, for "An improved fastener for windows."
- 18210. Graham Sarjeant Cory, for "An improved composition for roads, pavements and floors."
- 18251. William Ingram and Benjamin Langton, for "Improvements in machines for making sanitary pipes."
- 18334. Joseph Wharfe, for "Window lock."
- 18404. Theodor Schröder, for "Improvements in chimney-cowls."
- 18471. David Mitchell, for "Improved syphon-action for flushing water-closets."
- 18476. Thomas Black, for "Improved means for opening window sashes inwards."

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BARROWFORD.—Oct. 23.—For Building Board Schools. Mr. T. Bell, Architect, 14 Grimshawe Street, Burnley.

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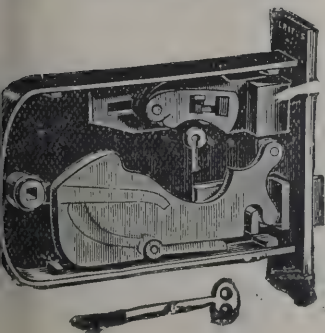
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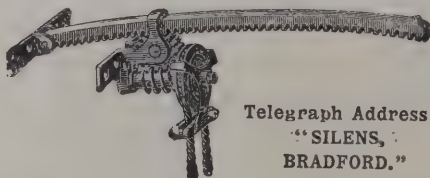
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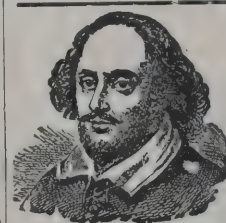
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J. & F. MAY, 239 High Holborn (<i>accepted</i>)	615	0	0

DARWEN.

For Additions to Central Stores, Darwen Industrial Co-operative Society. Mr. J. B. THORNLEY, Architect, Market Street, Darwen.

Mason Work Only.

Johnson, Manchester	£4,355	0	0
Houldsworth, Bradford	3,995	0	0
Lloyd & Millward, Darwen	3,895	0	0
J. KNOWLES, Darwen (<i>accepted</i>)	3,624	0	0
R. Shorrock, Darwen	3,548	0	0
W. Sharples, Darwen	3,450	0	0

DEADLAKE.

For Retaining Wall and Railing at the Deadlake, for the Deadlake Joint Committee. Mr. W. STRINGFELLOW, Surveyor, Town Hall, East Stonehouse.

Tozer & Son, Plymouth

T. MAY, Plymouth (*accepted*) . . . £292 15 0

T. MAY, Plymouth (*accepted*) . . . 251 19 0

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GARLIESTOWN.

For Work in Connection with the Garliestown Waterworks, for the Lower District Committee of the County of Wigtown, Providing and Laying 4,200 Yards of Iron Pipes, 2-inch to 3-inch Diameter, Constructing Collecting-chamber and Service Tank, Street Fountains, &c. Mr. JAMES BRAND, Engineer, Glenluce.

W. Pollock, Glasgow	£1,663	13	8
Harvie & Co., Glasgow	970	15	2
McElray & Co., Glasgow	899	6	5
H. Gibson, Dalmellington	834	5	9
L. Taylor, Hamilton	772	3	0
M. Pearson, Kilmarnock	771	9	5
J. Martin, Dunfermline	756	0	11
W. S. Osborne, Ayr	743	18	11
M. Green, Belfast	727	18	11
R. C. Brebner, Edinburgh	677	14	7
D. Purves & Co., Edinburgh	655	4	8
H. McLauchlan, Stranraer	650	1	6
H. McCutcheon, Whithorn	608	7	3
T. MERCER, Stranraer (<i>accepted</i>)	603	14	10

For Drainage Work, Garliestown. Mr. JAMES BRAND, Engineer.

Harvie & Co., Glasgow	£450	5	0
W. Pollock, Glasgow	424	1	11
H. Gibson, Dalmellington	394	1	3
R. C. Brebner, Edinburgh	366	17	3
M. Pearson, Kilmarnock	366	5	6
M. Green, Belfast	341	2	4
J. Martin, Dunfermline	321	10	10
W. S. OSBORNE, Ayr (<i>accepted</i>)	310	6	0
H. McCutcheon, Whithorn	288	3	11

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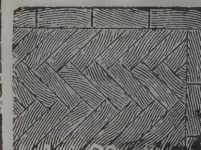
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HIGH WYCOMBE.

For Alterations and Additions at the Cross Keys Public-house, High Wycombe, for Messrs. Leadbetter & Bird. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, London, S.W., and High Wycombe. Barker, Kensington . . . £695 0 0 Nash, Wycombe . . . 542 0 0 Loosley, Wycombe . . . 490 0 0 Gibson, Wycombe . . . 448 0 0 Hunt, Wycombe . . . 393 0 0

For the Erection of New Hotel with Outbuildings, &c., in Green Street, High Wycombe, for Messrs. Leadbetter & Bird. Mr. ARTHUR VERNON, Architect, 29 Cockspur Street, London, S.W., and High Wycombe.

Barker, Kensington . . . £1,490 0 0 Boyle, Wycombe . . . 1,450 0 0 Harris, Bolter End . . . 1,361 10 0 Smith, Lahe End . . . 1,340 0 0 Hunt, Wycombe . . . 1,287 0 0 Dickens, Wycombe . . . 1,266 0 0 Loosley, Wycombe . . . 1,237 0 0 Nash, Wycombe . . . 1,235 0 0 Harris, Wycombe . . . 1,200 0 0 Flint, Wycombe . . . 1,167 0 0 GIBSON, Wycombe (accepted) . . . 1,140 0 0

LONDON.

For Repairs and Decorations to Guilsfield, Clapham Park, S.W. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, E.C. T. OSBORN & SONS, Lower Thames Street, E.C. (accepted) . . . £268 10 0

LONDON—continued.

For Repairs and Decorations to the Crystal Tavern, Burdett Road, E. Messrs. C. FOULSHAM & HERBERT RICHES, Architects, Bromley-by-Bow, and Crooked Lane, E.C. T. OSBORN & SONS, Lower Thames Street, E.C. (accepted) . . . £205 0 0

For New Drainage at Guilsfield, King's Road, Clapham Park, S.W. Mr. HERBERT RICHES, Architect, 3 Crooked Lane, E.C. T. OSBORN & SONS, Lower Thames Street, E.C. (accepted) . . . £104 0 0

For Alterations and Additions to Heating Arrangements at Workhouse, City Road, for the Guardians of Holborn Union. Mr. A. SAXON SNELL, Architect, 22 Southampton Buildings, Chancery Lane, W.C.

Comyn Ching & Co., Long Acre . . . £1,294 3 0 Defries & Sons, Houndsditch . . . 1,191 0 0 Waller & Co., Fish Street Hill . . . 1,160 10 0 Kite & Co., Euston Road . . . 976 0 0 Purcell & Nobbs, Cleveland Street . . . 973 0 0 Benham & Sons, Wigmore Street . . . 951 0 0 Vaughan & Brown, Kirby Street . . . 950 8 0 J. & F. May, High Holborn . . . 918 0 0 J. F. Clarke & Sons, Moorgate Street . . . 750 0 0 Moorwood, Sons & Co., Southampton Street . . . 550 10 0 STRODE & CO., Osnaburgh Street (accepted) . . . 497 0 0

For Providing and Fixing Two New Iron Buildings, Millwall Site, Glengall Road.

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For Provision and Erection of Three New Iron Buildings, near the Bromley Road School, Bromley.

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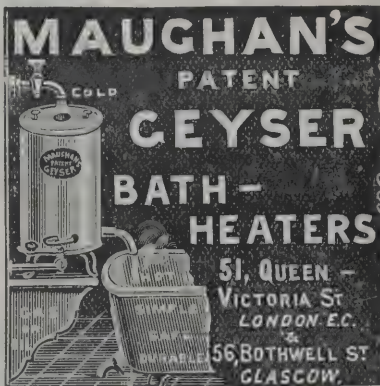
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For Enlargement of the Yerbury Road School, Upper Holloway, by 396 Places, and the Provision of Laundry and Manual Training Centres in Connection.

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J. Wilmott & Sons	£5,738	0 0	£110 0 0
H. Lovatt	5,616	0 0	83 0 0
N. Lidstone	5,345	0 0	78 0 0
T. Boyce	5,184	0 0	102 0 0
C. Miskin	5,181	0 0	103 0 0
S. & W. Pattinson	5,151	0 0	100 0 0
J. Grover & Son	5,124	0 0	103 0 0
W. M. Dabbs	5,026	0 0	101 0 0
Treasure & Son	4,987	0 0	117 0 0

For Building School, Fossdene Road Site, Charlton, for 789 Children.

			A
J. & F. Collinson	£18,199	0 0	£201 0 0
B. E. Nightingale	17,671	0 0	287 0 0
T. L. Green	17,598	0 0	300 0 0
Holliday & Greenwood	17,440	0 0	258 0 0
J. Longley & Co.	17,342	0 0	229 0 0
J. & M. Patrick	17,334	0 0	286 0 0
A. Reed & Son	17,291	0 0	285 0 0
G. E. Wallis & Sons	17,175	0 0	287 0 0
S. & W. Pattinson	17,025	0 0	275 0 0
J. Shillitoe & Son	16,700	0 0	230 0 0
Kirk & Randall	16,601	0 0	287 0 0

For Building School, St. Leonard's Street, Bromley, for 780 Children, and a House for Schoolkeeper.

			A
A. Reed & Son	£16,999	18 0	£230 10 6
H. Lovatt	16,974	0 0	271 0 0
Killby & Gayford	16,828	0 0	330 0 0
S. & W. Pattinson	16,596	0 0	407 0 0
W. Gregar & Son	16,513	0 0	280 0 0
E. Lawrance & Sons	16,312	0 0	305 0 0
C. Cox	15,831	0 0	305 0 0
Kirk & Randall	15,575	0 0	339 0 0
J. Mowlem & Co.	15,339	0 0	285 0 0

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For Refitting the Boys and Girls' Offices in Connection with the Alton Street School, Bromley, with Stoneware Troughs and Automatic Flushing-tanks, for Enlarging and Refitting the Infants' Offices, and for Providing a New System of Drainage at the same time.

T. Cruwys	£1,356	0 0
Calnan & Co.	1,150	0 0
Knight & Son	1,125	0 0
N. Lidstone	1,125	0 0
Lawrance & Sons	1,107	0 0
G. Parker	970	0 0

For the Erection of Three Shop Premises in Old Kent Road. Mr. H. LEWIS UPHAM, Architect, Sydenham.

A. Sykes	£2,940	0 0
Yardley & Sons	2,797	0 0
J. W. Faulkner	2,770	0 0
W. Marriage (<i>too late</i>)	2,660	0 0
J. & C. Bowyer	2,645	0 0
T. R. Roberts & Co.	2,590	0 0
Jerrards	2,587	0 0
A. Black & Son	2,580	0 0
W. Johnson & Co.	2,410	0 0
H. L. HOLLOWAY (<i>accepted</i>)	2,283	0 0

For Alterations and Additions at Nos. 1 and 2 University Street, Tottenham Court Road, for Messrs. T. W. Thompson & Co. Mr. ERNEST H. ABBOTT, Architect, 6 Warwick Court, W.C. Quantities by Mr. A. JOHNSON, 50 Imperial Buildings, Ludgate Circus, E.C.

Hall, Beddall & Co.	£1,646	0 0
Wontner, Smith & Son	1,639	0 0
Titmas & Sons	1,590	0 0
Halliday & Greenwood	1,577	0 0
Scrivenor & Co.	1,544	0 0
J. Anley	1,416	0 0
J. O. Richardson	1,278	0 0

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For Building Thirty Houses, Pontrhonda, Llwynypia, for the Sherwood Building Club. Mr. R. S. GRIFFITHS, Architect, Tonypandy.

Hatherly & Carr, Bristol	£11,150	0 0
Rowland & Lloyd, Trearlaw	5,970	0 0
E. Evans & Sons, Penygraig	5,940	0 0
J. REES, Pontygwaith (<i>accepted</i>)	5,510	0 0



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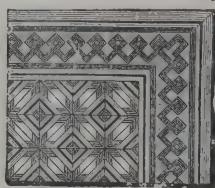
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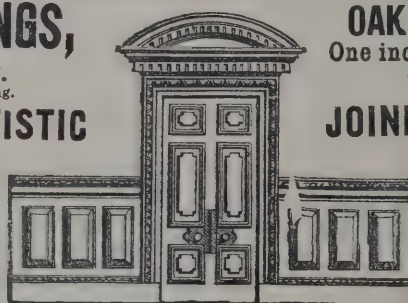
One inch and $\frac{1}{2}$ -inch thick.
Immense Stock always ready for Laying.



Turpin's Patent.

5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)

ARTISTIC



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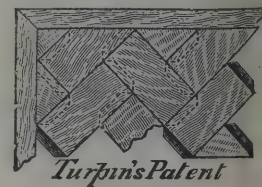
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MOSAIC

PAVING.

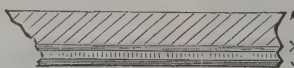
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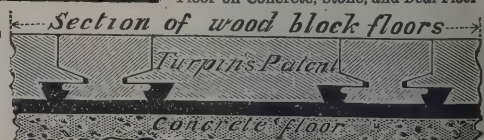


Turpin's Patent

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Wood Backings



Section of wood block floors

Turpin's Patent

Concrete floor

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For Converting Premises and Additions thereto, for the purposes of a Police-station and Residences at Glendower Street, Monmouth. Mr. WILLIAM TANNER, County Surveyor, Newport.

J. Mackie, Monmouth	£1,257	0	0
J. Linton, Newport	1,075	0	0
J. Parfitt, Newport	1,075	0	0
O. Parry, Monmouth	1,059	0	0
D. W. Richards, Newport	1,048	0	0
C. H. Reed, Newport	1,020	0	0
C. Morgan, Monmouth	969	0	0
KING & SONS, Gloucester (accepted)	938	0	0
County Surveyor's estimate	989	0	0

RUCKINGE.

For the Restoration of the Parish Church of St. Mary Magdalene, Ruckinge, Kent, for the Rev. G. Harris. Mr. E. P. LOFTUS BROCK, F.S.A., Architect.

B. E. Nightingale	£1,342	0	0
J. J. Wise	1,290	0	0
T. H. Lovell & Sons	1,265	0	0
W. J. Adcock	1,262	0	0
W. H. Bourne	1,130	0	0
H. Knock	1,070	0	0

SEAFORD.

For Building Infants' Schoolroom and Classroom to Accommodate 164 Infants, for the Seaford School Board.

F. Gough & Co., Hampstead	£1,026	0	0
Foster & Dicksee, Rugby	998	0	0
J. Vinall, Eastbourne	850	0	0
S. H. Berry, Seaford	749	5	0
C. Morling, Seaford	715	0	0
W. T. WATSON, Steyning (accepted)	529	0	0

STOCKPORT.

For Alterations and Repairs, 59 and 61 Lower Hillgate, for the General Purposes Committee. Mr. JOHN ATKINSON, Borough Surveyor.

R. H. Rogers	£338	4	7
T. Howe	337	16	6
J. Brown	335	7	0
W. Pownall	331	0	6
D. MULLANEY (accepted)	322	15	10

STOCKPORT—continued.

For Boundary Walling and Cast-iron Railing to Cattle Market and Fair Ground, Great Portwood Street, Stockport, and Public Conveniences. Mr. JOHN ATKINSON, Borough Surveyor.

W. Walker	£763	2	3
D. Mullaney	710	0	0
J. Briggs	688	0	0
J. Moss	670	0	0
W. C. Broadhurst & Co.	658	10	0
T. & W. MEADOWS (accepted)	650	0	0

ST. GEORGE.

For Building School at Two Mile Hill to Accommodate 970 Children, for the St. George School Board. Mr. JOHN MACKAY, Architect, Kingswood.

Hatherly & Carr, Bristol	£13,240	0	0
J. E. Davis, Bristol	12,386	0	0
G. Downs	12,250	0	0
E. Walters, Bristol	12,200	0	0
S. Williams, St. George	11,975	0	0
Love & Waite, Bristol	11,955	0	0
G. Humphreys	11,754	0	0
H. A. Forse, Bristol	11,600	0	9
Wilkins & Sons*	11,282	0	0
F. Martin, St. George	10,900	15	9
J. H. Wilkins, Bristol	10,880	0	0
Field & Sons, Bath	10,559	10	9
J. Wiltshire	10,076	18	10

* Accepted, with the addition of 180*l.* for Slate Roof instead of Roman Tiles.

SWINDON.

For Additions to the Eagle Tavern, Regent Street, New Swindon, for Mr. H. W. Thomas. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

W. Chambers, Swindon	£1,009	0	0
T. Barrett, Swindon	880	10	0
G. Wiltshire, Swindon	875	0	0
C. Williams, Swindon	860	17	0

For Rebuilding Dairy and Carrying-out various Works at Pry Farm, Purton, near Swindon. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

A. W. F. PARKER, Moredon (accepted).

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For New Stables and Alterations to the Bellevue Inn, Swindon, for Messrs. T. & J. Arkell. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

W. Chambers, Swindon	£401	18	6
T. Barrett, Swindon	333	0	0
G. Wiltshire, Swindon	310	0	0
J. WILLIAMS, Swindon (accepted)	308	7	0

For Alterations and Additions to the Artillery Arms, Regent Street, New Swindon, for Messrs. T. & J. Arkell. Mr. WILLIAM DREW, M.S.A., Architect, Swindon.

T. Barrett, Swindon	£259	0	0
W. Chambers, Swindon	248	0	0
G. Wiltshire, Swindon	240	0	0
C. WILLIAMS, Swindon (accepted)	239	10	0

THE WOLDS.

For Alterations and Additions to Denecourte, for Mr. J. Lytton Courtenay. Mr. H. BECK, Architect, Doncaster and London. Quantities by the Architect.

ELLIOTT & STOCK (accepted)	£6,400	0	0
Jackson & Sons	6,332	10	6

Minstrels' Gallery.

Jackson & Sons	490	0	0
ELLIOTT & STOCK (accepted)	482	0	0

TORQUAY.

For the Erection of the New Church of Holy Trinity, Torquay. Mr. JOHN WATSON, Architect, 1 Lower Terrace, Torquay.

Jones & Co., Gloucester	£13,513	0	0
G. H. Wilkins, Bristol	13,163	0	0
W. Trevenna, Plymouth	13,122	0	0
R. F. Yeo, Torquay	12,288	0	0
W. Gibson, Exeter	12,038	0	0
Jas. Julian, Truro	11,788	0	0
J. & A. Steere, Aveton Gifford	11,494	0	0
E. P. Bovey, Torquay	11,428	0	0
Love & Waite, Bristol	11,300	0	0
Wilkins & Sons, Bristol	11,269	0	0
Rabbich & Brown, Paignton	10,754	0	0
J. Smerdon, Torquay	10,030	12	0
S. Roberts, Plymouth	9,418	0	0
VANSTONE & MUMFORD, Torquay (accepted)	8,712	0	0

TOTTENHAM.

For Erection of Boundary Walls, Fences and Gates at the North-Eastern Fever Hospital, St. Ann's Road, Tottenham, for the Metropolitan Asylums Board. Messrs. A. & C. HARSTON, Architects, 15 Leadenhall Street, E.C.

Leslie & Co.	£3,123	0	0
Willmott & Sons	2,898	0	0
W. Shurmur	2,880	0	0
P. Hart	2,860	0	0
C. Miskin	2,687	0	0
W. JOHNSON & Co., Limited, Wandsworth Common (accepted)	2,653	0	0

WHITWOOD MERE.

For Paving in Rawgate, with Mountsorrel Granite, for the Whitworth Local Board. Mr. J. THORNTON, Surveyor, Whitwood Mere.

D. Speight, Leeds	£1,912	10	0
J. Naylor, Leeds	1,450	0	0
J. Speight, Leeds	1,387	10	0
J. Taylor, Huddersfield	1,350	0	0
P. Lane, Lincoln	1,237	10	0
E. Nichols, Morecambe	1,237	10	0
J. Hall, Sheffield	1,162	10	0

YOUGHAL.

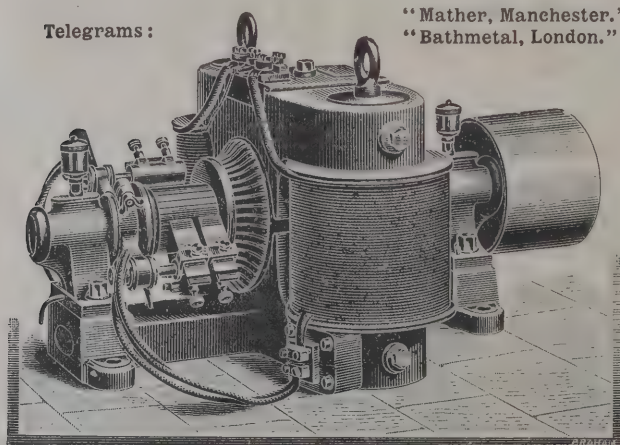
For Caretaker's Cottage, New Entrance-gates, Piers and Walling, Laying Main Drain, Pipe Sewer, Land Drainage and Other Works, for the Youghal Joint Burial Board.

T. McSweeney	£448	0	0
W. O'Callaghan	345	14	4
M. Murray	308	10	0
J. O'Callaghan	307	0	0
J. AHERN (accepted)	305	18	0

A NOVEL project it is said is on foot by which the waters of the river Kent shall be applied to the purposes of a new railway in the Lake district. It is proposed to construct an electric tram line from the Furness district to Bowness, with an auxiliary undertaking of eventually carrying it on to Ambleside. A meeting has been held at Cartmel with reference to the scheme, and water rights have already been secured in order that the electric current may be generated from turbine power.

Telegrams:

"Mather, Manchester."
"Bathmetal, London."

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An investment bringing in such a return in these dull days is worthy of attention. In a letter to the **YÖST TYPEWRITER COMPANY**, of date April 4 last, Messrs. PRICE BROS., of Dudley, wrote:—

"As to the objection of first cost, all we have to say is that we saved the cost of our Machine in less than twelve months."

TRADE MARK



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VARIETIES.

WE hear that Messrs. Cassell & Co. have arranged with the authorities of the Manchester City Art Gallery for the exhibition during the first week in November of the original drawings executed for their new art work, "Manchester Old and New."

A FIRE has taken place at Trinity College, Glenalmond, twelve miles from Perth. It originated near the great tower. The damage is estimated at 2,000*l*.

IN Dundee, on Monday night, a fire broke out in premises occupied as a cooperage and timber store. The building and its contents were totally destroyed, the loss amounting to between 5,000*l*. and 3,000*l*.

THE general meeting of the Edinburgh Association of Science and Arts was held on Monday night in the Scottish National Portrait Gallery, Queen Street, the hon. president, Sir R. Murdoch Smith, occupying the chair. The secretary's report on the past session, which was submitted, referred to the increased prosperity of the Association, and stated that the number of members had largely increased during the year, ninety-eight having been enrolled; the treasurer stated that there was a balance of 58*l*. 15*s*. 1*d*. at the credit of the Association.

THE general purposes committee of Crewe Town Council have decided to give 800*l*. for a site of land in Richard Moon Street, whereon to erect an art school costing about 5,000*l*. An agreement was also made to acquire five acres of land at Copenhall, to erect an isolation hospital costing probably about the same sum.

AT a meeting of the Wexford Corporation, Professor D. E. McCarthy, M.E., was appointed borough surveyor and inspector of waterworks in place of the late Mr. E. K. Ryan, C.E. There were, the *Irish Times* says, no less than seven candidates for the positions, the salary of both of which amounts to only 80*l*. per annum.

THE Association for the Promotion of Art and Music in the city of Glasgow have received from the executive committee a report from the master of works on the progress of the art Galleries in Kelvingrove. The portion of the work to the west of the central block may, with reference to the basement contract, be said to be completed with the exception of the steel girders and joists and glazed facing bricks required. In the central and eastern blocks the brickwork is in many portions approaching the basement floor level. Owing to the

coal strike, however, the supply of bricks has been to some extent deficient, and some portions of the work have been delayed in consequence.

THE opening meeting of the Manchester Association of Engineers has just been held. Members to the number of 150 visited the Manchester Corporation Hydraulic Station in Gloucester Street and the electric works in Dickinson Street. They were conducted by Mr. F. M. Evanson, engineer, over the hydraulic station, and over the electric works by Mr. C. H. Worthingham, engineer.

LOCAL demands and structural exigencies having rendered desirable the enlargement of Croydon General Hospital, the foundation-stone of the new wing of which was laid, the *Croydon Advertiser* says, by the Duke of Edinburgh during the mayoralty of Mr. Jabez Balfour, of Liberator notoriety, on Saturday last the Archbishop of Canterbury opened a new wing of two wards containing forty beds, with kitchens and stores on the top storey. The new building has been constructed by Mr. Samuel Page, of Croydon, everything internally is of the newest design and constructed upon the most approved modern hygienic principles, and all the fittings have been supplied by local tradesmen.

ADDITIONS have been made to the church of St. Michael Camden Town, of chancel, south aisle and chapel. The edifice was erected from the designs of Messrs. Bodley & Garner, architects, London, the builders being Messrs. Stephens & Bastow, of Bristol, with the assistance of their foreman, Mr. Hampton.

SERPENTINE, admirably adapted for industrial purposes, and of an oil-green colour, semi-transparent, is, Mr. John Plummer, of Sydney, writes, found on the Murrumbidgee, at Bingera, county of Murchison; Warialda, county of Burnett; Barraba, Manilla, county of Darling, and Stony Batta, county of Hardinge. Different varieties of red-veined serpentine, steatite and other similar minerals are reported in the Upper Peel River. It also occurs at Coolac and Jones's Creek, near Gundagai, county of Clarendon, and on the Clarence River. A foliated variety of serpentine occurs on the Murrumbidgee, of a yellowish colour, associated with a dull red and green serpentine rock, and at Cowabee, forty miles from Wagga Wagga, with leaf gold. A fibrous variety of serpentine is found at Kelly's Creek, Gwydir River, and in the serpentine at Bingera, county Murchison, with meerschaum. It occurs also as a green striated mineral at Lucknow, county Wellington, and Wentworth, near Orange, county Bathurst.

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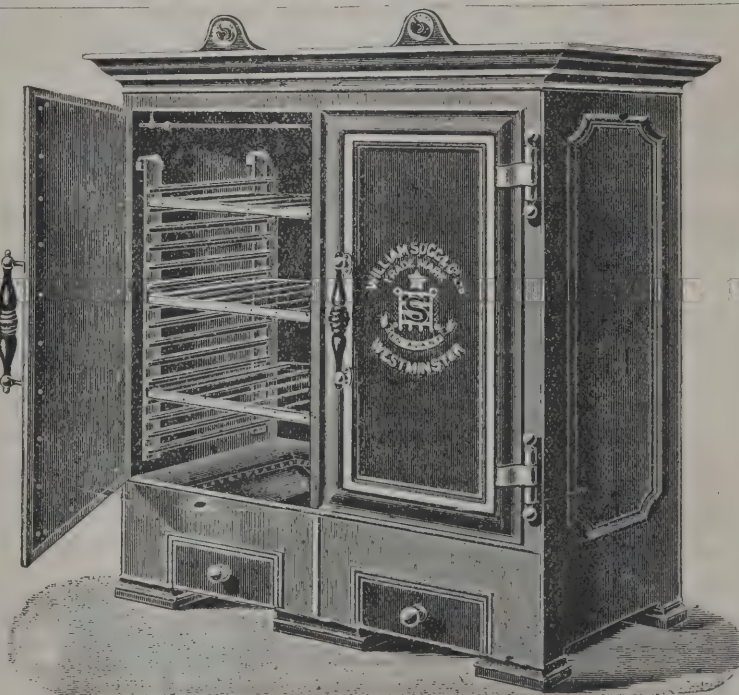
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1a Ludgate Hill, E.C.; 33 Bold Street, Liverpool, &c.

TRADE NOTES.

THE Yöst typewriter has been awarded a gold medal at the Lyons Exposition, one of the most important exhibitions held in France this year. This has been immediately followed by the award of the gold medal to the same machine at the British and Colonial Exhibition at Manchester. The Yöst record is now seven gold medals, with highest honours on every occasion.

THE new Church schools, Gosport, are being warmed and ventilated throughout by means of Shorland's patent Manchester grates and patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A VERY fine new clock has just been fixed in the parish church of Newland, Gloucestershire, which strikes the hours, chimes the quarters, and shows time on a 6-feet dial. The whole of the work has been carried out by Messrs. John Smith & Sons, Midland Clock Works, Derby, who made the clock for St. Paul's Cathedral.

THE Edinburgh School Board have accepted tenders for the enlargement of the Royal High School, Canonmills, Leith Walk, and Regent Road schools—the probable total cost being 8,200*l.* for the High School, 750*l.* for Canonmills, 1,800*l.* for Leith Walk, and 1,000*l.* for Regent Road.

THE LATE J. H. OSBORNE, C.E.

THE death is announced at his residence, Summerseat, near Philadelphia, of Mr. John Humfrey Osborne, who has been a prominent civil engineer in the United States for over half a century. He was born in Dublin, September 30, 1818. On leaving school he travelled widely, visiting Australia among other countries. In 1839 he went to the United States and became confidential secretary to Mr. Wirt Robinson, chief engineer of the Philadelphia and Reading Railroad. From that time he threw himself ardently into the profession of engineering, and rose to be chief assistant in 1843. Three years later he was appointed chief engineer of the Philadelphia and Reading Railway, but resigned that position later on to join with his brother, Mr. R. B. Osborne, in the construction of the Waterford and Limerick Railway. Returning to the United States in 1850, he was appointed to the Ogdensburg and Lake Champlain Railway, and the next year took charge of a portion of the construction of the Southside Railway in Virginia. From 1852-53 he was superintendent of the

Richmond and Danville Railway, and on resigning that post to become associate chief engineer and superintendent of construction of the Camden and Atlantic Railway, was presented with a massive service of plate as a mark of the affection and esteem in which he was held. After the opening of the Camden and Atlantic Railway in 1854, Mr. Osborne became its general superintendent, but resigned his post four years later, to take charge of the construction of the most difficult section of the Lebanon Valley Railway through the counties of Berks and Lebanon, Pennsylvania. In spite of great difficulties Mr. Osborne completed this work to the day, and publicly received the congratulations and thanks of the president and board of directors. In 1858 he also rebuilt the Quakake Railway, uniting the Lehigh Valley, Black Creek branch, with the Catavissa Railway above Tamaqua, and with his brother, Mr. R. B. Osborne, made a survey for the continuance of this line into the Mahanoy coalfields. In 1873 he also undertook with Mr. R. B. Osborne an extensive barometrical survey for the Shenandoah Valley and Ohio Railway from Harrisonburg, Virginia, over the Great Northern and intervening mountains, crossing the Alleghanies into the valley at the head waters of the Greenbriar River. Mr. Osborne continued from time to time to take an active part in his profession, to which he was much devoted; but for the past twenty years practically lived in retirement at his country place, Summerseat, between Philadelphia and New York—one of the oldest and most interesting residences in the United States. Mr. Osborne was a civil engineer of great executive power, administrative ability and indomitable energy. Though a strict disciplinarian, he won the respect and strong attachment of his colleagues and all who served under him, which the many memorials and souvenirs presented to him testify.

MR. ARTHUR V. RUTTY, for the executrix of the late Geo. G. Rutty, writes us as follows:—I have the pleasure of informing you that the Corporation of West Ham have made a trial of my Improved Patent McAdam Road Scarifier on the Barking Road with very satisfactory results. Drawn by an ordinary 10-ton steam roller, 400 to 500 yards per hour are effectually scarified. The local authorities at Epsom, Ilford, Hendon and Dublin are now regularly working the machine with their own rollers. I have just completed the road in Hyde and St. James's Parks, 130,000 yards super, under contract for H.M. Office of Works.

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GRUNDY'S SPECIALTY. PURE WARM AIR
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Truro Cathedral; Londonderry Cathedral; Sherborne Abbey; Kilmore Cathedral; Stanley Cathedral, Falkland Islands; Cardiff Catholic Cathedral; the Queen's School Chapel, Eton; Cork Asylum; Leicester Asylum; and to upwards of three thousand Places of Worship; and a great number of Mansions, Houses, Hotels, Hospitals, Schools, Warehouse Factories, Workhouses, &c.

Sir WILLIAM BROADBENT encloses cheque for the "GRUNDY" HEATING APPARATUS supplied to his house, and is glad to say that has proved very satisfactory for warming and ventilating as required. The principle of the apparatus is most excellent.—To Mr. Grundy.

PROFESSOR TYNDALL writes:—

Dear Sir,—My house being so well provided with grates and flues for the generation and distribution of pure warm air, I have been thus enabled to spend my winters in England instead of on a foreign shore,—Yours very truly,

October 24, 1893: Hind Head House, Haslemere.

JOHN TYNDALL.

Dr. GRIEVES says:—

I have insisted upon my architect adopting the "GRUNDY" system of pure warm air for Heating and Ventilating Buckhurst Manor. should not like my house warmed with any other method, for I like plenty of ventilation and do not approve of stagnant air.

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ILLUSTRATIONS.

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ST. JOHN'S WOOD.

THE "THOMAS" REGENERATIVE GAS LAMP.

MESSRS. W. M. STILL & CO., of 24, Charles Street, Hatton Garden, E.C., have recently been appointed the sole manufacturers of the "Thomas" patent gas lamps, and the facilities at their disposal should certainly insure excellence of material and finish with prompt execution of orders, for metal spinning in every department has been their specialty for many years, and large premises resounding with the hum of machinery attest the fact that they are doing a considerable business. Every detail of work in connection with the "Thomas" lamp will be of English manufacture and in experienced hands, an important feature when it is remembered that so many so-called regenerative lamps are defective in mechanical parts, and continually getting out of order. The "Thomas" lamp claims, in fact, to be an improvement in existing lamps, in that it is simpler in construction and so less liable to get out of repair. Professor Lambert, M.A., of the Royal Naval College, Greenwich, S.E., instances his using a "Thomas" regenerative lamp for 400 days of four hours per day, and the burner required cleaning out once only. The burners possess no intricate parts or fine perforated metal or gauze, a frequent cause of imperfect combustion on account of dirt clogging the action of the burner. It is also claimed that the flame being placed below the reflector considerably increases the illuminating power and economises the consumption of gas. It cannot be objected that only one pattern is supplied to meet all purposes, for the "Thomas" lamp is adapted to cover the whole range of

lighting. They have, for instance, a special design for warehouses, restaurants, public buildings, &c., in the "Thomas" patent globe lamp, the shape of which insures a ceiling and downward light, and is also more ornamental. The globe lights up a space of 40 feet square. Drawing and dining-room lamps are also in evidence in fancy Doulton-ware casings and fancy etched shades, and are claimed to be less costly than ordinary chandeliers with open burners. Ventilating lamps for billiard-tables, &c.; high power windproof lamps for outside shop-lighting are amongst other specialties. For some years a special feature has been made of railway platform lighting, and the principle has been largely adopted on the Metropolitan Railway at Gower Street, Baker Street, Portland Road and Bishopsgate Stations with uniform success, an experience which led to their being specified at the new station at Moor-gate Street, now in course of construction. With such credentials the "Thomas" patent gas lamps should increase in popularity, and be recommended in every case where efficient and economical lighting is the desideratum.

IMPROVEMENTS AT THE HOUSES OF PARLIAMENT.

A SERIES of alterations, involving a total expenditure of 14,000*l.*, has, says the *Times*, during the recess been in active progress within the Houses of Parliament, no fewer than 240 men being engaged upon the work. The scheme is almost entirely embraced by the recommendations of the select committee of the House of Commons which sat last session under the presidency of Mr. Herbert Gladstone, and the changes to be carried out mainly affect the accommodation of members and of representatives of the Press in the House of Commons. It will be remembered that the committee, after considerable discussion, resolved that it was undesirable to build a new House of Commons or to enlarge the existing chamber; and, having regard to previous inquiries on the subject, as well as to the late period of the session at which they assembled, the committee refrained from taking evidence concerning the general ventilation of the House. One of the principal recommendations contained in the report of the committee aimed at an enlargement of the kitchen accommodation, which has been exceedingly unsatisfactory, and

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an addition to the space available for the purpose is now being made by extending the ground floor at the point into the Commons inner court. A servants' hall will there be provided, together with manager's-room, cigar and wine stores, and a waiters' dressing-room. New wine despatch cellars will take the place of the old lift-room, and a new staircase for the use of the staff will ascend from the kitchen to the dining-room floor. An excellent kitchen 40 feet long is being constructed by the absorption of the room previously occupied by Dr. Percy, and the ceiling is covered with cement to prevent the possibility of any smell ascending. Immediately adjoining the kitchen will be the lower service-room, from which four hydraulic lifts will rise to the level of the members' dining-rooms. At the opposite end of the kitchen will be a pastry-room and a separate room for the chef. The cooking appliances will at the same time be improved, and it is hoped that the general result will be to make the dining arrangements for members much better than they have been hitherto.

The members' principal dining-room, which is one of the finest apartments in the palace, is being restored to its original beauty, much of which has been hidden by successive alterations and encroachments. The ungainly projection formed by the old wine-bar has been removed, and in future the wine will be so served from a similar room under the groined arch seen from the lower waiting-hall. The grill—an exceptionally fine piece of ironwork—has also been taken down and re-erected in a large general service-room, located between the large dining-room and a new dining-room secured by the conversion of the old smoking-room. All the four lifts will enter the general service-room, and the apartment is being fitted with hot closets and all the conveniences incidental to efficient dining arrangements. No structural alteration will be made in the dining-room reserved for Ministers, but double window-frames are being affixed in each of the three dining-rooms, and the entire suite will be redecorated, the effect of which work will be to show the fine oak panelling in the members' large room to the fullest advantage. Committee-room E, hitherto used by the grand committee on law, is to take the place of the smoking-room thus appropriated for dining, and the standing committee will be transferred to the spacious chamber in the north-west corner of Westminster Hall, first used for the sittings of the Royal Commission on Labour. When not required for committee purposes, this room will be made available for the private secretaries of members of Parliament. By concession on the part of the Lord Great

Chamberlain and Lord Morley, two of the Railway Commissioners' rooms are in future to be at the service of members for deputations or conferences, one of the present conference-rooms being devoted to type-writing. The octagon-room will also be used for small private conferences or meetings.

Alterations calculated to add materially to the comfort of members are also being carried out at the foot of the staircase leading from the committee corridor to the reading-room and to Ministers' private rooms. The two small dining-rooms which there existed have been abandoned, and the space will be set apart to provide dressing-room accommodation and a hair-dressing saloon. There will be seven cubicles, so that members may dress for dinner without going to their town residences or to clubs. As a further convenience, baths are for the first time being introduced. The old bakehouse has been utilised, and four private baths are being erected in rooms of the most approved type. Equivalent dining accommodation for members who desire to introduce strangers will be provided by the conversion of two of the Ministers' rooms adjoining the main terrace dining-rooms and of the terrace reading-room, with the result that there will be a net gain of thirty seats by the new arrangement. Among other structural changes will be a slight enlargement of the post-office in the members' lobby, which will give, under the staircase leading to the peers' gallery in the House of Commons, a certain amount of additional window space.

Visitors to the chamber will welcome the announcement that when they sit underneath the gallery it will no longer be necessary for them, as in the past, to vacate their places every time a division is challenged. Hence the familiar order given from the chair, "Strangers will withdraw," will no longer be heard. The public admitted to the seats below the gallery will retain their places during divisions, and a light handrail will prevent the possibility of any intrusion upon the precincts of the House. Electrical communication will be established between the chamber, the library and the smoking-rooms, and the division bells will be extended to the grand committee-room in Westminster Hall.

The improvements in connection with the Press gallery include the construction of two new entrances in place of the one formerly existing in the centre, which will now be closed; the enlargement of the kitchen by the absorption of the tea-room, the acquisition as a new tea and reading-room of that formerly occupied by Colonel Legge, the assistant serjeant-at-arms, and the construction of a "copy" carrier from the

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gallery to the junior messengers' room in the Star Chamber. The chaplain's room has been set apart for the members of the *Times* staff, accommodation being found for Archdeacon Farrar in one of the rooms originally intended for Ministers. It is not expected that Parliament will be summoned to meet before the end of January or the first week in February, and by that time the whole of the alterations described, forming the largest scheme undertaken at the Palace of Westminster in recent years, will have been completed. The work is being carried out under the direction of Mr. John Taylor, the chief surveyor of Her Majesty's Office of Works, with the assistance of Mr. Jones, the clerk of the works, and Mr. Prim, the resident engineer.

THE DYKE CABLE-WAY AT BRIGHTON.

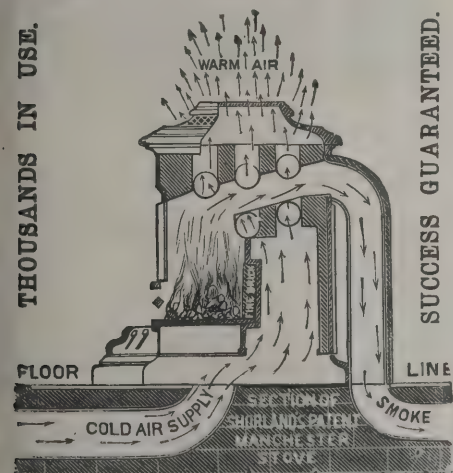
THE opening ceremony took place on Saturday in connection with the new cable-way across the "Devil's Dyke," the well-known resort some five miles inland and uphill from Hove, whence such extensive and beautiful views are obtainable. The Dyke itself, says the *Standard*, is one of the deepest and steepest of the many combs into which the geological chalk tracts are always more or less cut up by natural causes. The heights referred to have long been seized upon by "trippers" and pleasure-seekers, and the paraphernalia of a standing fair are more in evidence now than the Roman fortifications which are popularly supposed to have existed there in former days. The distance across the valley from summit to summit is over fifteen hundred feet, and the depth below the level of the new cable-way is 230 feet perpendicular. This work is a practical demonstration of the suitability and capacity of this particular system for doing pioneer transport duty under circumstances in which the ordinary railway could not possibly be remunerative. Switchbacks, gigantic wheels, high towers, water-chutes and other sources of sensation have proved popular and profitable, and the new experience of travelling in a cage suspended from a rope in mid-air may be expected to form a remunerative addition to the attractions of the Dyke, especially as the capital outlay on this cable-way, with all the incidental expenses of a first essay, was under two thousand pounds. On Saturday the Mayor of Brighton (Dr. Ewart) and Mayoress, Mr. William Spink, the chairman of the Telfer Cable and Cliff Syndicate, and the inventor, Mr. Brewer, at one o'clock precisely, opened the undertaking for public use by making a journey across from side to side. There have been numerous examples of

telfer lines in single rope, double rope, and electrical haulage for minerals, but we do not recall any really convenient and suitable application of the system to passenger conveyance. The Mayor's journey, and the others made during the next three hours by the numerous visitors at least are evidence that in this case the result is successful. The Syndicate have employed as contractors Messrs. Heenan & Froude, the constructors of the Blackpool Tower, who are now engaged in erecting the still loftier one at Wembley Park. They have further obtained certificates of the safety of the line and its fulfilment of the requisite conditions of service from Mr. Eric Scott Russell and Mr. Molesworth, members of the Institute of Civil Engineers.

The Dyke cable-way is undoubtedly a novelty in engineering. It is constructed of the lightest and strongest materials—steel wire-rope and angle-iron. It is very simple in its detail and in its working. The primary support of the suspended track is a steel-wire cable, which is carried 1,200 feet from side to side of the valley over two lofty columns, formed of angle-iron rivetted, erected at some distance down the slopes of the banks. The ends of this catenary cable are anchored into the solid chalk, near the summits of the valley crests. Screws of steel 10 feet in length are provided for putting the requisite tension on this cable. From this cable a series of steel anchors are suspended by wire-ropes of smaller dimensions at suitable distances, the lengths varying according to the position of each to the catenary curve of the main cable, so that the anchors are all upon a level from one end to the other of the cable-way. The distance from fluke to fluke across the anchors is about 2 feet, and instead of the ordinary points there are sockets by which the steel road-rope is supported and firmly secured. Thus, instead of a railroad or a platform, there are two parallel horizontal wire-ropes maintained by the anchors. The catenary cable is, seemingly, a 3-inch one, and the road-ropes each about an inch in diameter. The breaking strain of the main cable would probably be some hundred and sixty tons, and as the road-ropes relieve rather than add to the strain there should be no misgiving with regard to the strength of the entire structure. The passenger-cars—or rather cages, for they are formed of iron rods and stout wiring—are about 7 feet long and about 5 feet wide, capable of holding eight persons sitting back to back. They are suspended from the two track-way ropes by four pulleys attached to the inwardly-curved ends of the four main rods of the car. Thus the pulley axles are always outside the track-ropes and always at the same distance apart, and the pulleys can never get off the

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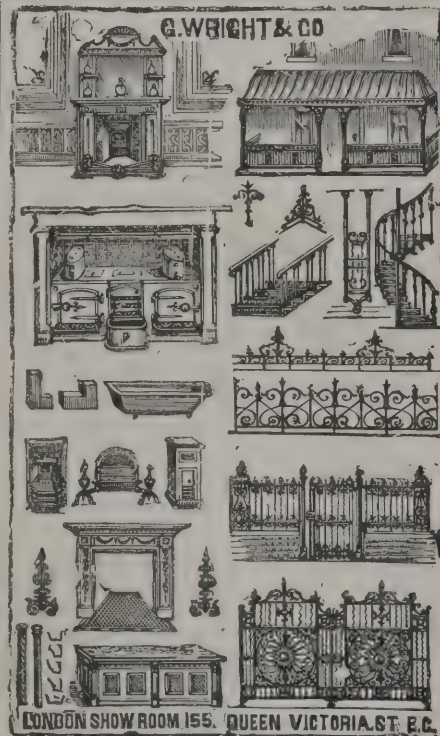
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ropes. This arrangement has also the advantage that no provision has to be made for clearing the supports of the roadway at any point whatever, as the cars pass completely free within the supporting columns. The haulage of the cars on the Dyke line is effected by a $4\frac{1}{2}$ horse-power Crossley's oil engine, which drives a small endless wire-rope on a perpetual horizontal plane, the hauling-rope passing within the curves of the anchors. The car can be gripped to either portion of the hauling-rope, and its course can be controlled on the journey if required. An electric telegraph-wire is permanently provided for communication along the line, available alike to cars and stations. The time occupied in transit between the terminal stations is two and a half minutes.

THE BATHS' CLUB, DOVER STREET, MAYFAIR, W.

THE above club, which will shortly be ready for the reception of members, is novel as far as London is concerned, but in America and Scotland, where similar clubs are in existence, they have become exceedingly popular. The object of the club is to afford its members accommodation for swimming and gymnastics, and also for Russian, Turkish and other baths. The building, which has been erected for the purpose, although not much to look at externally, is magnificently fitted internally, and no expense has been spared in making it a most desirable resort. The Turkish chambers consist of sudatorium, tepidarium, frigidarium, shampooing and washing-rooms, with Russian, plunge, shower, douche, steam douche, wave and sitz baths attached. The spacious bath hall contains the swimming pond, about 75 feet long by 35 feet broad, varying in depth from 3 to 7 feet. Diving-boards are fixed at various heights above the water, and entrance is given to the swimming pond direct from the lavatorium. At one end of the hall the fencing-room and gymnasium are fitted up with all the necessary appliances for gymnastic exercises, in addition to which trapeze travelling rings, flying rings and horizontal bars are suspended over the swimming pond. Suites of dressing-rooms are arranged on one side of the hall. The whole building is comfortably heated and ventilated, the water in the swimming pond being kept pure, and at a temperature of about 65 degrees at all seasons. There is a well-appointed hair-dressing saloon in connection with the baths. Those parts of the buildings which contain the dining, reading, smoking, billiard and bed-

rooms (forty), while communicating with, are distinctly separate from the baths and gymnasium. Special provision is made for breakfasting members who may wish to enjoy the swimming bath in the morning. The building has been erected by Messrs. J. Allen & Son, of Kilburn, and the whole of the laundry machinery has been supplied by Mr. Harper Twelve-trees, of London and Manchester. The total cost of the works has been about 70,000*l.* The architect was Mr. Collins B. Young, of Cockspur Street, and Mr. Donald Milne, clerk of works.

AUCTIONEERS' BENEVOLENT FUND.

THE annual meeting of the Incorporated Auctioneers' Benevolent Fund was held on Monday at the Mart, Tokenhouse Yard, Mr. Daniel Watney (treasurer), presiding. In their report the committee of management stated that the subscriptions for the past year had exceeded those of any previous twelve months, the amount being 322*l.* as against 303*l.* in 1893. A legacy of 100*l.* had been received during the year, which, with a further 150*l.*, had been invested. During the current month the committee would be in a position to allot another annuity of 20*l.*, for which they had already several applications. In moving the adoption of the report, the Chairman said that the committee had approved the principle of the appointment of honorary secretaries for particular counties, large towns and agricultural centres, and a number of gentlemen had consented to act in that capacity. During the ten years of the fund's existence, ending in 1893, the amount of relief given was 2,114*l.*, as compared with 524*l.* in the previous ten years. He was pleased to say that the present year showed that a much larger proportion of pecuniary assistance was being distributed, and he hoped the income would enable them to increase the amount in future. Mr. R. W. Scobell seconded the motion, which was adopted. Mr. H. H. Price (Market Harborough), Mr. C. C. R. Spelman (Norwich), and Mr. Hugh Turner (Ipswich), were elected members of the committee of management.

THE public parks committee of the Edinburgh Town Council have recommended the acceptance of an estimate of between 300*l.* and 400*l.* for the improvement of the Braid ponds, with the object of making them suitable as safety ponds and for other purposes.

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ELECTRIC LIGHTING AT WORCESTER.

THE Corporation electric-light works at Worcester have been opened. Mr. W. H. Preece was selected as consulting engineer. Tenders were invited for the construction of works and supply of light equal to 12,000 ten candle-power lamps, and fifteen applications were received from some of the leading electricity companies. Worcester is the first town to utilise to any extent the water-power at its doors, for, although the works will be supplied with steam machinery for use in case of flood, the electric current will be chiefly generated by means of turbines placed on the river Teme at Powick, where there is a weir of 12 feet fall. From Powick the current is conveyed underground a distance of three miles to Worcester, and there distributed throughout the city. In addition to lighting the streets and public buildings, electric power is made use of for pumping purposes at the Corporation waterworks, and the Council supply the electric current to private consumers for either motive or lighting purposes at reasonable rates. The light was "switched on" by the Mayor, who afterwards entertained a large company at the Guildhall.

POPLAR PUBLIC LIBRARY.

THE new public library erected by the commissioners for All Saints, Poplar, has been formally opened, having been about a year in progress. The site is in High Street, in the heart of the parish, and is of a good size, so that it has been possible to obtain three important requisites, namely, space on the ground storey for all the parts which are to be used by the public; good lighting by windows, skylights being avoided throughout; and complete quiet for the readers. The library entrance leads into a vaulted hall about 12 feet square; from this the office is entered, and the inner hall is reached through swing doors. Other swing doors lead into the public space of the lending library, 20 feet long by 11 feet wide. Behind the counter are the book-stores, giving room for 35,000 to 40,000 volumes. The upper floor, designed for a part of the book-store, has been omitted for the present, in order to save outlay. The news and reference-rooms are reached from the south end of the inner hall. Each of these rooms will give accommodation for 120 readers, and they are both lighted in the same way, by windows low down on one side and by windows on both sides of a clerestory. The centre portion of the news-room is

22 feet 6 inches high, and the side portions about 11 feet. The staff behind the counter of the lending library can overlook the whole of the public portions of the building, as also the sub-librarian in his glazed enclosure, formed in the corners of news and reference-rooms. Messrs. McCormick & Sons, of Canonbury, were the builders, Mr. Williams being their foreman. Mr. H. G. Rogers was clerk of works. Messrs. Strode & Co. carried out the heating by low-pressure hot water. The gaslighting is by Wenham ventilating lamps, so that the products of combustion are all carried away by iron pipes in the roofs. "Adamant" is used for the internal plastering. The librarian's residence occupies the one and two-pair storeys of the tall central block in front. Messrs. Clarkson, of Great Ormond Street, were the architects to the commissioners.

WORKMEN'S DWELLINGS IN MANCHESTER AND SALFORD.

OF practical questions in social politics we shall, says the *Manchester Guardian*, probably in the municipal elections be most concerned with that dealing with the provision of workmen's dwellings. In Manchester the three great districts of Ancoats, Hulme and Angel Meadow, and in Salford the long and crowded district running north of Chapel Street from the Exchange Station to Regent Road, present as a continual problem for the people how, with small means, to find a suitable dwelling within easy distance of the work-place. In Manchester the Corporation, acting through the sanitary committee, have made a beginning in building workmen's dwellings. In Ancoats, where new "labourers' dwellings" have been and are being built, the primary consideration with them was to remove insanitary cottage property which was a discredit and a menace to the health of the city. The Local Government Board, before sanctioning any interference with this property, demanded that new dwellings should be provided in substitution of those condemned, and that they should be put up within a reasonable distance. The Corporation, so far as their scheme has gone, have really covered anew ground that a twelvemonth ago was littered with decayed shops and old back-to-back cottages. Two schemes are now practically completed—that of "No. 2 Block" in Oldham Road, and that of Pollard Street, further in the rear. "No. 1

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Block" in Oldham Road yet remains to be dealt with. The old buildings on it have not yet been pulled down.

The cost of the new dwellings to the city when all the accounts have been made up will, of course, be found considerable. The block of buildings which faces Oldham Road is a great deal the larger of the two completed schemes. It is five storeys high, and besides a row of fourteen shops which extends along its Oldham Road front for 264 feet, it has 284 labourers' dwellings, made up of 236 which are termed "double" and forty-eight "single" dwellings, with other shops at the basement corners. The whole building covers a square bounded by four streets—Oldham Road in the front, Spittal Street and George Leigh Street at the sides, and Bengal Street in the rear. The building runs out and is carried up flush with the pavement on all four sides. This leaves a vacant square in the middle of the ground, the boundary of which is the building itself. The whole square—buildings and playground together—contains 7,800 yards, practically $1\frac{1}{4}$ acre. Of this, three-quarters of an acre is covered with buildings and the remaining acre is that left in the middle as a playground for the children of the people who will occupy the dwellings. The cost of the buildings when finished—they will not be entirely so for a few weeks—will be a little over 50,000*l*. The cost of the land to the Corporation may be reckoned at 5*l*. per square yard, bringing the total cost of the 7,800 square yards on which the Oldham Road dwellings are built to about 90,000*l*. It is in the calculation of the cost of the land, however, that the primary object of the scheme must be considered. As a mere speculation in a site for new dwellings it could scarcely be said that the Corporation had set foot on the most solid of bargains. But other considerations than that of money remain. The insanitary block that covered the ground has been swept away. It should also be remembered that the cost of arbitration and the charges for compensation enlarged the total cost of the land. Half a dozen public-houses had to be bought along with the goodwill of a number of shops, and the worst of buildings have, it is found in arbitration, some kind of monetary value.

In this new departure the question most debated is, naturally enough, whether the plan adopted by the Corporation is the best that could be chosen. It can scarcely be said that superabundant provision has been made for workpeople with families either in the Oldham Road block of buildings or in that in Pollard Street, the latter of which has 135 dwellings, as compared with the 284 in the Oldham Road block. The "double dwellings," which are the largest provided, and of which the

blocks mainly consist, have each no more than two rooms and what is termed a "lobby," the latter being really the passage to the rooms inside the door of the dwellings. The rooms themselves are of good size. The "living-room" is 14 feet 6 inches by 12 feet, and the bedroom 9 feet by 12 feet. All the rooms are 9 feet high. The inside walls are plastered, the lower part painted, and the upper stained. Gas is laid on in the "living-room" on the "penny-in-the-slot" system. A small meter high in one corner of the room has a "slot" similar to that of the universal sweetmeat provider on the platforms of railway stations. You drop a penny in the gas-meter "slot" and are provided with 25 feet of gas—a rate, of course, of 3*s*. 4*d*. per 1,000 feet. The penny-in-the-slot system gives an almost infallible method for discovering the relative values as illuminants of gas and of oil. The calculations of two householders in the dwellings, made on pretty exact observations, went a day or two ago in favour of oil. "I burn oil in part for the eyes and in part for the pocket," said a venerable dame. She had made her reckoning to the hour, and proved by it that "three-haporth" of oil was exactly equal to "four-penorth" of gas. She, however, admitted that "gas is the sweetest thing." This was on account of the bracket, which "set the room off nicely." Of room-fittings, the "double dwellings" are provided with hanging cupboards in the bedrooms. The cooking ranges in the living rooms are better than those usually found in cottages, and there are, as may be supposed, a "sink" and a dresser. The sanitary arrangements, so far as fittings go, are of the best, but there are scarcely enough of them. The system is water-carriage and all the pipes are airtight at the sides and ventilated at the top. Coal-boxes are provided in the passages. One apparent imperfection is the lack of main approaches to the dwellings. No more than four are provided, one at each corner. From each of these steps go up to "balconies" which run right round the outer wall of the building on (the inner side of the square) level with each of the four upper "flats" or storeys. It is difficult to say, after the usual fashion, in what style of architecture the building is designed. The balconies 'despoil it of the appearance on the inner side of the square of a series of warehouses, of which the doors, rising one above another, appear like the "lifts." Possibly the balconies, which are sufficiently wide, will allow of plant or flower culture in pots, otherwise there will be no scrap of green to break the monotony of red brick with red facings of which the whole block is built. The acre of ground which the block encloses is being laid in "granolith," which is a mix-



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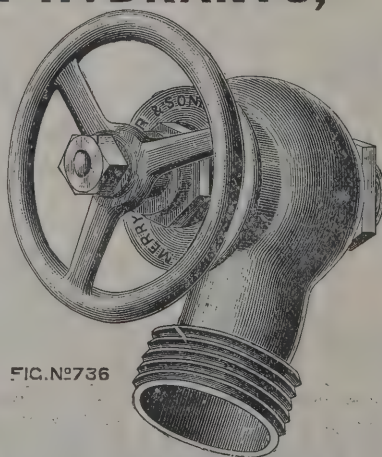
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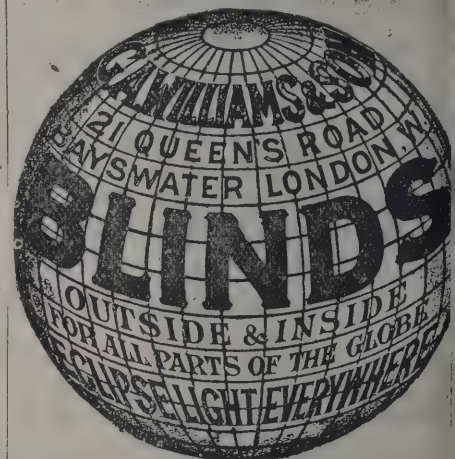
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ture of granite and cement that will form a sound "floor" to the playground. At each of the four corners of the building is an upper storey—really the sixth—each of which contains a wash-house and drying-room. Twenty-four boilers are provided and the drying space in the upper rooms is perhaps sufficient. As yet the wash-houses have been scarcely used. The cost of fuel for a large boiler is considerable, and the stock of washing usually not large.

The rentals of the dwellings do not lean too greatly to the side of cheapness. For the two-room dwellings on the Oldham Road side—of which there are forty-eight—the weekly rent is five shillings. This part of the building has twenty-four "dwellings" of a single room each, of which the rent asked will be three shillings weekly. None of these dwellings are yet out of the hands of the painters—they will be in a few days—so that none of them are yet let. On the Spittal Street side there are fifty-seven "double" dwellings; the weekly rental of each is four shillings. On the George Leigh Street side there are seventy "double" dwellings with rentals of four shillings weekly, and twenty-four single dwellings with rentals of 2s. 6d. weekly; and on the Bengal Street side there are sixty double dwellings with rentals of four shillings weekly. Besides, a deposit of five shillings is required from each householder before he enters on occupation. With this he gives the superintendent who lives on the dwellings a signed application bearing his name, his occupation, his "present address," the number of rooms required in the house, whether he is married or single, the number of children residing with their parents, the ages of the boys, the ages of the girls and also a personal reference. He is then handed a set of rules which, as they number seventeen, are too long to be here set out in full. They provide for a good many possible eventualities, including, if necessary, ejectment at forty-eight hours' notice. Already there are about seventy-five tenants in this Oldham Road building. These chiefly occupy the two-room four-shilling dwellings. Oddly enough they are not in the main drawn from the inhabitants of the Ancoats district, but are from Hulme, Lower Broughton and districts wider of the city, whence workpeople whose occupation is in the city have come to be nearer their employment. Some of the five-shilling houses on the Oldham Road front even have been asked for. It would be scarcely wise to conclude that "barrack life," as it is termed, is popular in Manchester. The supreme consideration is to be near work. "Trams," said one tenant, "cost money, and they take time too." This tenant was an hotel porter. Skilled mechanics, who can

perhaps better afford the money if not the time for a journey home of a mile or two out of the city, do not form a great proportion of the occupiers of such "block dwellings" as we have yet in Manchester and Salford. Warehouse porters, market and street labourers, carmen and men employed in the other thousand and one different ways in shops, factories and warehouses in the centre of the city appear to be of those who are perforce ready to take almost anything that can be got in the way of convenient homes.

In Salford the Corporation have undertaken a scheme which is considerably less ambitious than that of Manchester. They have cleared away some of the insanitary and rickety property behind Greengate, which, shut in here and there by the walls and arches of the Lancashire and Yorkshire Railway, was about as unlovely a spot as the most inveterate of "slummers" could desire to look on. On the cleared space, bounded on the one side by Queen Street and on the other by Rolla Street, they are building a double block of dwellings which, as distinct from the title of "labourers" in Manchester, are here called "artisans' dwellings." The two blocks, with a kind of half-connecting smaller block at one end, will contain sixty-nine dwellings. One advantage they have over those in Manchester. They are no more than three storeys high, and that, in the opinion of those who already occupy houses of the kind, is a distinct gain. In the absence of a "lift," supplies of all kinds, even coal, have to be carried by hand to the top storeys, and these, therefore, usually let at a smaller rental. Otherwise the Salford dwellings are very similar in character to those in Manchester. The floors of the rooms in each instance are of wood, and of the approaches cement, and the sanitary arrangements are excellent. There is a rather larger provision of that kind in the Salford dwellings. The "houses" here also, however, contain no more than two rooms, with the consequence that children must either occupy the same bedroom as their parents, or that the "living-room" must be made to serve a double purpose. Between the two blocks of buildings in Salford, and opening to another street, Collier Street, is an "open court" of good size which will serve as a playground. Another difference between the Manchester and the Salford schemes lies in this—that the Salford block has more approaches, which divide the balconies, and therefore give each house greater seclusion. The washhouses in the Salford blocks are at the end of each "flat" or storey, and one wash-house will serve for the use of about half a dozen dwellings. The outer walls of the two blocks are of grey brick, with red

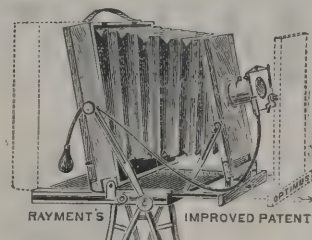
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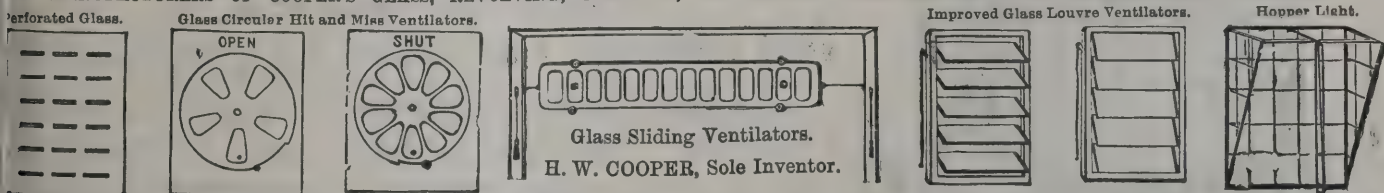
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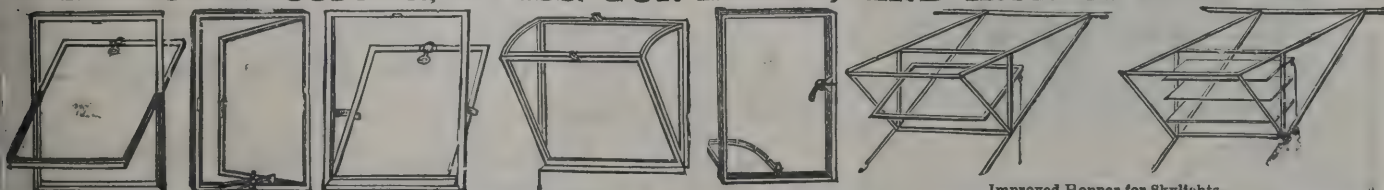
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terra-cotta dressings. Besides the two rooms to each dwelling, in Salford a small scullery of about 5 feet by 5 feet is provided. The living-rooms are 14 feet 3 inches by 13 feet 6 inches, and the bedrooms 13 feet 6 inches by 9 feet. The bedrooms here face the outer streets, while in the Manchester blocks the contrary rule applies, the bedrooms facing the central ground. The cost of the Salford block, so far as the building is concerned, will be about 12,500*l*. As the blocks will not be completed for several weeks, the rentals have not yet been fixed. Here, as in Manchester, the cost of the land, when the total has been reckoned, will be found heavy. Compensation of various kinds is included in the bill.

Of "block" dwellings which have undergone the test of occupation, one of the most interesting is that belonging to the Lancashire and Yorkshire Railway Company in Oldfield Road. The company, in enlarging their line, dispossessed a number of people of their houses, and the block is therefore one of the "compensatory" kind demanded by the Local Government Board. It contains sixty dwellings, arranged on four floors, and has been occupied since April 1893. The principal difference in the accommodation here provided and that of the Manchester and Salford schemes is that the greater number of the dwellings have two bedrooms besides the living-room, complete sanitary appliances, and a separate entrance from the balcony. The "single" houses have one bedroom. The block is well divided by stairs. Gas is supplied on the "penny-in-the-slot" system. The rents are, for the three-roomed houses on the ground and first floor, 3*s*. 9*d*. weekly, two-roomed houses 3*s*. 3*d*. On the two higher floors the rents are 3*s*. 6*d*. for three-roomed houses and 3*s*. for two-roomed houses respectively. These dwellings are now, and for some time have been, full. The tenants belong to the same class of workpeople as those in the Manchester Corporation dwellings. No spare land for "play-grounds" remained on this site, and the roof is therefore laid flat, railed round, and used for that purpose. The washhouses are also built on the roof, but their end would have been better served if the chimneys had been carried higher. The additional value gained by nearness of the dwellings to the men's places of work is shown clearly under the scale of rents paid to the Lancashire and Yorkshire Company. They have, besides the Oldfield Road block, two other smaller blocks near Blackfriars Street—Trinity Buildings and Springfield Buildings. Here the accommodation provided is similar to that in Oldfield Road, but the rents—the houses being nearer the city—reach the higher rate of 4*s*. 6*d*. weekly.

INSANITARY DWELLINGS IN BIRMINGHAM.

At the Birmingham police-court on Friday last an application was made on behalf of the health committee, under Part 2 of the Housing of the Working Classes Act 1890, for orders against the owners of forty-two houses to close the property, on the ground that the houses were in a state so dangerous to health as to be unfit for human habitation.

The first summons was against the trustees of Mason College.—Mr. Bell said he had received a letter from the trustees of the college consenting to a closing order being made, as the house was about to be pulled down.—Dr. Alfred Hill, medical officer of health, said the house was in 21 Court, Lancaster Street. It was in a very dangerous state, the living room having a capacity of only 302 cubic feet, while the bedroom, which was over the washhouse, had a capacity of 840 cubic feet. The house was damp and defective, and unfit for habitation.—The magistrates made the order.

The next summons was against Mr. Thomas Henry Goodwin Newton, Barrells Park, Henley-in-Arden, in respect to six houses in Woodcock Street.—Mr. Chatwin said he appeared for Mr. Newton, and must ask for an adjournment of the cases on the ground that his client was not served with the summonses. Mr. Bell objected to an adjournment on the ground that, as Mr. Newton was served with notices in May last to put the houses in habitable repair, he had had plenty of time to make up his mind what he was going to do in the matter. The houses were damp, defective and dilapidated, and unfit for habitation. Therefore an adjournment would be a serious thing. If the order asked for was granted Mr. Newton could apply for the houses to be reopened if they were put in habitable repair.—Mr. Chatwin said he was informed that extensive repairs had been done by the lessee, and that the property was now in fair tenable condition.—The magistrates granted an adjournment for seven days.

Sir Alfred Sherlock Gooch was summoned in respect to ten houses in Duddleston Row.—Mr. Bell said that Sir Alfred was the freeholder, and therefore the owner against whom the Corporation had to take proceedings, but part of the premises were in the occupation of a leaseholder named Barry, less than twenty-one years of whose lease remained unexpired. Therefore, it was not charged against Sir Alfred that he permitted the premises to get into this dangerous condition. Still, the property was in a damp and dilapidated condition and unfit for habitation.—Mr. H. Young (who represented Sir Alfred

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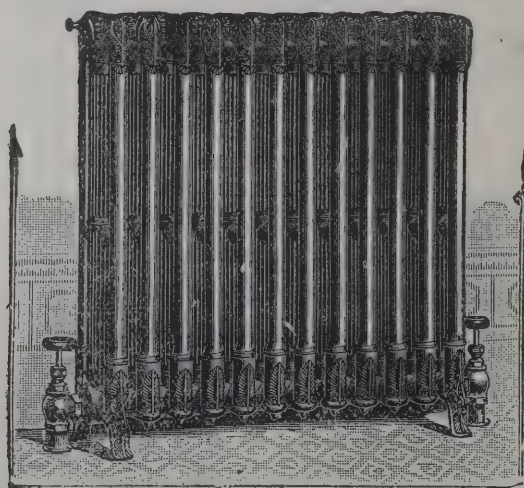
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Gooch) said that as his client was not in possession and had no control over the property, he was not in a position to admit that the houses ought to be closed.—Dr. Hill, medical officer of health, said he had examined the houses in No. 3 Court, Duddleston Row. No. 9 was a small house, consisting of two small rooms; the walls were dirty and damp, the floors defective, the ceilings low and filthy, and the roof defective. The house was only 7 feet from the front of No. 2, and therefore obstructive to it. The houses generally had no back doors, but stood back to back, so that ventilation was almost impossible. The houses were dirty and unhealthy. Dr. Hill spoke in detail of each of the ten houses, and said that the whole of them were in a dilapidated condition, and so dangerous to health that they were unfit for human habitation.—Mr. Young said his client was not in receipt of the rents, but he had, in accordance with the 47th section, given notice to the Corporation of the person who was the owner of the rack rents so that the notice might be served on him.—Mr. Bell said that section only referred to cases where there were two owners within the meaning of the Act. Supposing there was a term of twenty-two years outstanding, then under the Act the Corporation would have to serve the leaseholder, and then the freeholder could serve them with notice that he was interested in the property as the freeholder, so that the premises should not be demolished without his knowledge. But there was nothing in the Act which said they must serve the leaseholder with a term of less than twenty-one years unexpired, because that would contradict the 29th section, which said that the owner should be any person except a man having less than twenty-one years of his lease unexpired.—Mr. Young did not agree with Mr. Bell, but the point was immaterial, as his client had given the notice he was required to give. The lease had less than twenty-one years to run, and therefore Sir Alfred Gooch was brought into court, although he had no power to do anything to obviate the nuisance complained of. The Act defined the word "owner," which in this case meant Sir Alfred Gooch, because the lease had less than twenty-one years to run. It said that if the owner was not in the receipt of the rents and profits, he should give notice to the Corporation of such ownership, and that had been done.—Mr. Bell said that Sub-section 1 of Section 47 said:—"Where an owner of any dwelling-house is not the person in receipt of the profits thereof, he may give notice of such ownership to the local authority, and the local authority shall give to such owner notice of any proceedings taken by them." "Such owner,"

however, was not to be the lessee.—Mr. Shirley Smith, who represented the lessee, Mr. John Joseph Barry, was granted permission, although he had no *locus standi*, to address the court. He said his client had not been served with any notice by the Corporation in respect to the application, and therefore if a decision was given which affected his houses it would be without his having had an opportunity of doing sufficient repairs to keep the houses open.—Mr. Carter (magistrates' clerk) said the Act contemplated that being done, for it had been decided that the owner might be summoned over the head of the occupier, although the latter might be liable to do the repairs. That hardship had been contemplated by the Public Health Act.—Mr. Smith: Without notice?—Mr. Carter: Oh yes, without notice.—Mr. Smith said his client did not wish to have insanitary property, but he did not wish to have proceedings taken without his knowledge, or without an opportunity being given him of putting the property in repair.—Mr. Bell said the other side did not offer any evidence that the houses were in a fit state for habitation.—The magistrates granted the order to close the houses.—Mr. Young said his client raised no objection to the houses being closed. His predecessor granted a lease of the property on July 30, 1790, for 107 years, so that about two years remained unexpired. There was no doubt a good deal of the property was in a very dilapidated state, so much so that Sir Alfred Gooch's representatives had been trying unsuccessfully for some time to get possession of the property in order that it might be pulled down or put in a different state more adapted to the requirements of the town than when it was built 107 years ago. But Sir Alfred was powerless in the matter. He was unable to get possession of the property, and had no right to go upon it to do anything himself. Under the lease there were covenants to repair, and his only remedy was to enforce the covenants by an action for damages. At the end of these long leases it was often difficult to find out who was the person really responsible and liable to be sued for breach of the covenants. Sir Alfred offered no objection to the houses being closed, but he wished the magistrates to understand that he was powerless to do anything himself.—Mr. Smith said that when the orders were served his client (the lessee) would have to consider his position.

In the case of the representatives of the Lichfield estate, Mr. Ebenezer Piercy, Great Barr, the trustee, and Mr. Goodwin, solicitor, Cannon Street, who were served with notices respecting four houses in 36 Court, High Street, Deritend, did not

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appear.—Evidence was given that the property was unfit for habitation, and orders were made that the houses should be closed.—Mr. J. C. Holder was summoned with reference to two houses in Lancaster Street. Mr. Bell said the summonses would be withdrawn, as the houses had been pulled down.

An application was made to close nine houses in Barford Street, and Mr. William Every, solicitor, Honiton, appeared on behalf of the owners.—Mr. Every said his clients were in the same position as Sir Alfred Gooch. They were the freeholders and powerless to interfere with the property. The property was let in 1787 and 1788 on leases for 117 and 116 years, so that the leases expired in ten years' time.—Dr. Hill, medical officer of health, gave evidence with regard to the condition of the nine houses, which, he said, were built below the street level. The walls and floors were damp and defective, the ceilings were damp and cracked, some of the windows did not open and others only half-way, and the roofs of several of the houses were defective. The houses were certainly unfit for habitation. In reply to Mr. Every, Dr. Hill said the walls of the structures were sound.—The houses were ordered to be closed.

In the case of Margaret Jackson, Oldham, who was summoned in respect of four houses in Summerhill Street, her agent, Benjamin Daubs, Dolobran Road, Sparkbrook, appeared and admitted that the property was in a defective condition, and consented to a closing order being made.—The magistrates granted the order.

The last person summoned was Mr. John Joseph Barry, the owner of six houses in 13 Court, St. George's Street, which the Corporation asked should be closed. Mr. Shirley Smith appeared for Mr. Barry.—Dr. Hill said the houses were in a very dilapidated state when he saw them, and unfit for habitation. Some of the houses were unoccupied and nailed up.—Mr. Smith said the rents of the houses only produced 39s. in July, August and September, and the ground rent was 25s. a year, so that the property would not stand much expense.—Mr. Barry was called, and said that the property was not nearly so bad as represented by Dr. Hill. The houses had been repaired. He admitted, in cross-examination by Mr. Bell, that he was interested in a great deal of dilapidated property. It was not true that a closing order had been made against him in respect to property in Bordesley, but he had applied for an order under the 1875 Act to reopen some property. The application was refused on the first occasion, but that was because he did not know the requirements of the authorities. He proposed to put the whole of the property referred to in St. George's Street in

habitable repair.—Mr. W. F. Newton, architect, said he examined the premises on the previous day, and found them in fairly good condition. In his opinion they were fit for habitation.—The magistrates adjourned the case for fourteen days, in order that they might inspect the property themselves.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

18524. Fred Walsh, for "Improvements in and apparatus for connecting and securing soil-pipes to water-closets."

18535. John Gill, for "Improvements in furnaces for destroying town refuse and the like."

18654. Arthur William Adams, for "Improvements in the construction of bolts, locks, latches, fastenings and stays for casements, sashes, windows, doors and other analogous structures."

18671. Villiers Barrett Lennard, for "Improvements in disinfecting apparatus for use in water-closets, urinals, lavatories and the like."

18672. John MacLachlan, for "Improvements in door latches and locks."

18693. John Fielden, for "An improved chimney-pot."

18732. August Föppel, for "Improvements in the construction of roofs."

18782. Frederick Dakin, for "Improvements in door-closing appliances."

18793. Hugh Kerr, for "Improvements in and relating to windows."

18806. Charles Henry Kitching, for "An improved syphon for water-closet and other suitable cisterns."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

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There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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CONTRACTS OPEN.

ABINGDON.—Nov. 3.—For the Erection of a Library and Reading-room. Mr. J. G. T. West, M.S.A., Abingdon.

ACCRINGTON.—Nov. 13.—For Pulling-down and Rebuilding St. James's Schools. Mr. Bell, 14 Grimshawe Street, Burnley.

ALNWICK.—Nov. 2.—For Erection of Premises. Mr. George Reavell, jun., Architect, Alnwick.

ALNWICK.—Nov. 5.—For Building Five Houses. Mr. M. Temple Wilson, Architect, 69 Narrowgate, Alnwick.

ALVERSTOKE.—Oct. 27.—For Set of Closets for Workhouse. Mr. Harry A. P. Smith, Architect, Star Chambers, Gosport.

BARMOUTH.—Oct. 31.—For the Supply and Erection of Ten Baths for Hot and Cold Sea-water. Mr. Thomas Blackburn, C.E., Barmouth.

BATTERSEA.—Oct. 27.—For Erection of an Additional Swimming-bath and other Works. Mr. Rowland Plumbe, Architect, 13 Fitzroy Square, W.

BELFAST.—Oct. 27.—For Exhibition Buildings. Mr. R. I. Caldwell, 21 Arthur Street, Belfast.

BELFAST.—Nov. 5.—For Building Hospital. Mr. W. J. Fennell, Architect, 11 Chichester Street, Belfast.

BELFAST.—Nov. 8.—For Service Reservoir and Main Conduit. Mr. L. L. Macassey, Engineer, Waterworks Offices, Belfast.

BLACKPOOL.—Oct. 29.—For Church Tower and Spire. Messrs. Walker & Collinson, Architects, 13 Piece Hall Yard, Bradford.

BRISTOL.—Nov. 29.—For Caretaker's House to School. Mr. F. Bligh Bond, Architect, 36 Corn Street, Bristol.

BRIXWORTH.—Oct. 31.—For Tramp Wards at Workhouse. Mr. A. Lewis, Surveyor, Brixworth, Northants.

BROMLEY.—Oct. 30.—For Sewering, Levelling, Paving, Metalling and Channelling Work. Mr. F. H. Norman, Clerk to Local Board, Bromley, Kent.

BURNTWOOD.—Nov. 12.—For the Construction of Additional Wards at Staffordshire County Lunatic Asylum. Mr. Stanger, Queen's Chambers, North Street, Wolverhampton.

BURTON-ON-TRENT.—Oct. 30.—For the Construction of Main Intercepting Sewers. Mr. J. E. Swindlehurst, Borough Surveyor, Burton-on-Trent.

BURTON-ON-TRENT.—Oct. 30.—For the Supply and Delivery of about Thirty Tons of Cast-iron Pipes. Mr. J. E. Swindlehurst, Borough Surveyor, Burton-on-Trent.

CANNOCK.—Nov. 2.—For Enlarging Board-room for Guardians. Messrs. J. R. Veall & Son, Architects, 84 Darlington Street, Wolverhampton.

CARDIFF.—Oct. 31.—For Building Church. Mr. E. G. Halliday, Architect, 14 High Street, Cardiff.

CHARMINSTER, DORSET.—Oct. 31.—For the Erection of a Church. Mr. G. T. Hine, 35 Parliament Street, Westminster.

CHEDDLETON.—Nov. 30.—For Erection of a Lunatic Asylum. Messrs. Giles, Gough & Trollope, Architect, 28 Craven Street, Strand, W.C.

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CROYDON.—Nov. 6.—For Addition of Seven Blocks to Borough Hospital, at Waddon. The Borough Engineer.

CWMBACH.—Oct. 30.—For Two Villas. Mr. T. Roderick, Architect, Aberdare.

DUBLIN.—Nov. 3.—For Building Public Offices and Town Hall. Mr. Thomas Drew, R.H.A., Architect, Dublin.

DUKINFIELD.—Oct. 29.—For Pair of Semi-detached Villas. Mr. T. D. Lindley, Architect, Ashton-under-Lyne.

DURHAM.—Oct. 29.—For Additions to Aden Cottage. Mr. H. T. Gradon, Architect, Market Place, Durham.

EASTBOURNE.—For Pulling-down Nos. 55 and 57 Terminus Road. Messrs. Mitchell & Ford, 2 Langney Road, Eastbourne.

EAST GRINSTEAD.—Nov. 6.—For Building Offices for Messrs. Hastie, Little & Hughes, Solicitors. Mr. H. E. Mathews, Architect, 11 Dowgate Street, E.C.

FULHAM.—Oct. 31.—For Making-up and Paving Two Streets. Mr. Chas. Botterill, Surveyor, Town Hall, Fulham.

GARFORTH.—Oct. 27.—Pair of Semi-detached Houses. Mr. W. H. Beevers, Architect, 25 Bond Street, Leeds.

GOOLE.—Nov. 7.—For Building Market Hall, Shops, Offices, &c. Mr. W. J. Tennant, Architect, Pontefract.

GRIMSBY.—Oct. 29.—For Building or Altering Premises for Cycling Club House. Mr. A. Bramwell, 37 Connamore Road, Grimsby.

HALIFAX.—Nov. 8.—For Building Board School. Messrs. Horsfall & Williams, Architects, 15 George Street, Halifax.

HARROGATE.—Nov. 3.—For Building Board School, Master's and Caretaker's Houses, &c. Messrs. H. & E. Marten, Architects, Charles Street, Bradford.

HEADINGLEY.—Oct. 31.—For Alterations and Additions to Castle Grove. Mr. T. Butler Wilson, F.R.I.B.A., 12 East Parade, Leeds.

HOMERTON.—Oct. 30.—For Well and Borehole at Workhouse. Mr. J. Owen Perry, Clerk, Homerton, N.E.

HOMERTON.—Oct. 31.—For Completion of Well and Borehole at Workhouse. Mr. J. Owen-Perry, Clerk's Office, Hackney Union.

KEIGHLEY.—Oct. 27.—For Building Board School. Messrs. Judson & Moore, Architects, Burlington Chambers, Keighley.

KENSINGTON.—Nov. 1.—For the Erection of New Block for Married Couples at the Workhouse. Mr. T. W. Aldwinckle, 1 Victoria Street, S.W.

KILWINNING.—Oct. 29.—For Building Hospital. Mr. John Armour, Architect, Irvine.

KIRKBY-LE-SOKEN.—Oct. 31.—For Building Six Cottages. Mr. H. W. Gladwell, 3 South Crescent, Walton-on-the-Naze.

LEICESTER.—Nov. 26.—For Constructing Shelter at Recreation Grounds. Mr. E. G. Mawbey, Borough Surveyor.

LICHFIELD.—Nov. 12.—Additions to Lunatic Asylum, Burntwood. Mr. Stanger, Architect, Queen's Chambers, North Street, Wolverhampton.

LONDON.—Oct. 31.—For Supply and Delivery of 1,000 Tons Aberdeen Granite Pitching and 70 Tons Guernsey Ditto. Mr. W. H. Atkins, Board of Works Offices, Emerson Street, S.E.

MANCHESTER.—Nov. 5.—For Water Meters and High-pressure Meters. Secretary, Waterworks Office, Town Hall, Manchester.

MONMOUTH.—Oct. 26.—For the Erection of a School for the Haberdashers' Company. Mr. Henry Stock, 9 Denman Street, London Bridge, S.E.

NEATH.—Nov. 1.—For Building Shops, Offices, &c. Mr. T. C. Wakeling, Architect, Merthyr Tydfil.

NEWHAVEN.—Nov. 5.—For Building Board Schools. Messrs. Clayton & Black, Architects, 152 North Street, Brighton.

NEWPORT.—Oct. 29.—For Building Boys and Girls' Schools. Mr. Benjamin Lawrence, Architect, Dock Street, Newport, Mon.

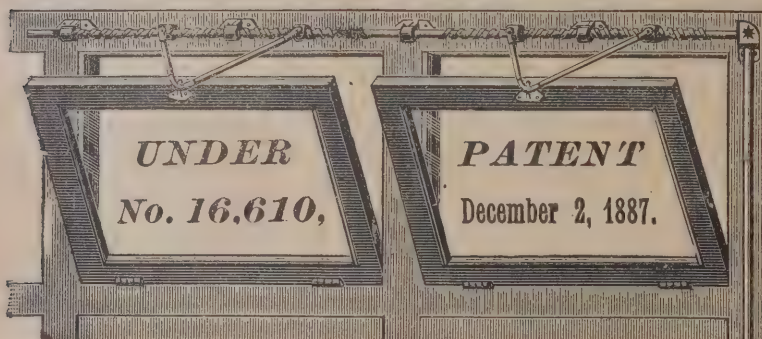
NEW ROSS.—Oct. 30.—For Parish Church. Mr. Walter G. Doolin, B.E., Architect, 20 Ely Place, Dublin.

NEW TREDEGAR.—Oct. 30.—For Building Chapel and Vestry. Mr. W. S. Williams, Tredegar.

POPLAR.—Oct. 31.—For Alterations at the Union Workhouse. Messrs. Clarkson, 136 High Street, Poplar.

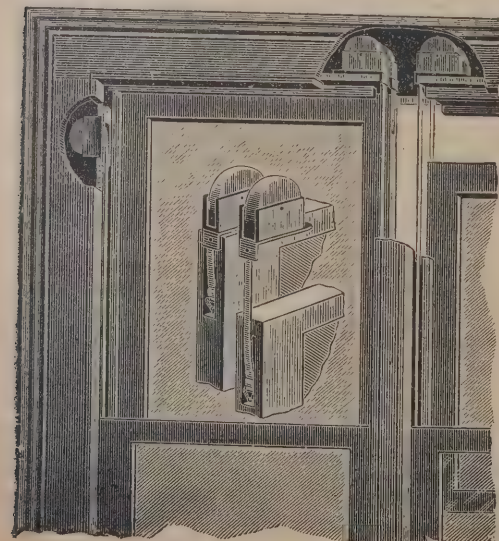
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SHEFFIELD.—Oct. 31.—For the Erection of a Refuse Destructor. Mr. C. F. Wike, C.E., Bower Spring, Sheffield.

SLIGO.—Oct. 3.—For Additions to Lunatic Asylum. Mr. P. J. Tuohy, Custom House, Dublin.

SOUTHAMPTON.—Nov. 2.—For Additions to Oddfellows' Hall. Mr. J. H. Blizzard, Architect, Castle Lane, Southampton.

SOUTH NORMANTON.—Oct. 29.—For Building Infant School. Mr. J. T. Shardlow, Architect, Blyth Road, Worksop.

ST. ANNES.—Oct. 29.—Tower and Spire to Church. Messrs. Walker & Collinson, 13 Piece Hall Yard, Bradford.

ST. AUSTELL.—Oct. 31.—For Building Assembly Rooms. Mr. Silvanus Trevail, Architect, Truro.

TREFOREST.—Nov. 13.—For Extension of Gasworks. Mr. T. Newbigging, Engineer, 5 Norfolk Street, Manchester.

WALTHAMSTOW.—Oct. 26.—For Making-up Streets, Laying Concrete Flags, and Laying Fifteen Granite Cube Crossings. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WALTHAMSTOW.—Oct. 26.—For the Erection of Wrought-iron Unclimbable Fencing. Mr. Geo. W. Holmes, A.M.I.C.E., Town Hall, Walthamstow.

WIGAN.—For Building Church Schools. Messrs. Heaton & Ralph, Architects, Wigan.

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W. Delt, Beccles	57	5	0
Hayward, Saxmundham	51	6	0
B. Bird, Ipswich	44	15	0
F. Woods, Bungay	34	0	0
J. MANN, Beccles (accepted)	32	15	6
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W. H. Thomas & Son, Bodmin	784	7	11
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Engineer's estimate	690	0	0

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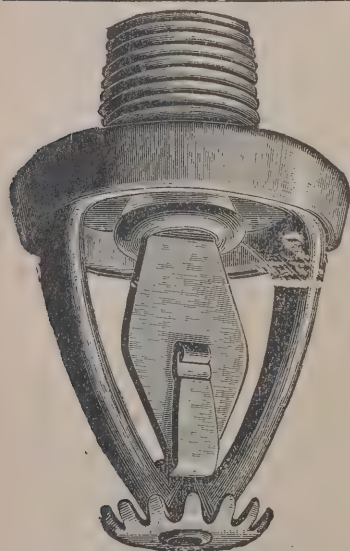
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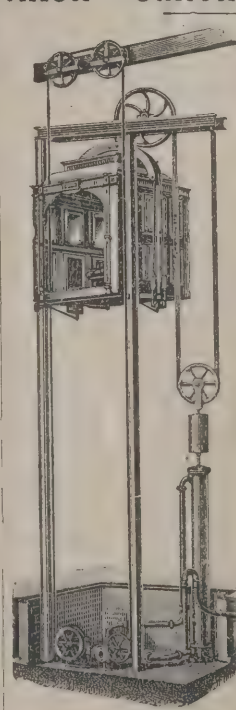
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LONDON—continued.

For Alterations to the Gloucester Tavern, 187 Sloane Street, Belgravia, S.W., for Messrs. Hall & Pinn. Mr. ALEX. S. PATERSON, Architect, 12 North Street, Westminster.			
Garlick & Horton	£1,440	0	0
Saunders & Sons	1,222	0	0
Turtle & Appleton	1,176	0	0
Brown	1,126	0	0
Burman & Son	1,022	0	0
Edwards & Medway	990	0	0
Beer & Gash	987	0	0
DEARING & SON, Islington (accepted)	895	0	0

Pewterers' Work.

Burley	65	11	0
Edwards	58	0	0
HEATH (accepted)	56	0	0

For Building the New Cripplegate Institute. Mr. S. R. J. SMITH, Architect.

Castle Bros.	£30,265	0	0
Hall, Beddall & Co.	29,980	0	0
Simpson	29,174	0	0
Dove Bros.	28,845	0	0
Mowlem, Burt & Co.	28,500	0	0
Higgs & Hill	28,444	0	0
T. H. Higgs	28,296	0	0
Fort, Hickson & Co.	28,075	0	0
Perry	27,990	0	0
Lawrance	27,800	0	0
Bywater	27,658	0	0

For Providing Drawing Class-room, Manual Training Room, and Chemical Laboratory at Board School, Beresford Street, Walworth.

Johnson & Co.	£2,844	14	0
McCormick & Son	2,529	0	0
Mid-Kent Building and Contracting Works, Limited	2,392	0	0
W. Holt & Sons	2,318	13	8
J. & C. Bowyer	2,312	0	0
J. Smith & Sons	2,260	0	0

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LONDON—continued.

For Refitting the Offices in Connection with Boys' Department of Monnow Road School, Bermondsey; Enlarging the Infants' Offices, Erecting New Offices for Girls' Department, and Providing New System of Drainage.

William Downs	£1,190	0	0
Lathey Bros.	980	0	0
W. Akers & Co.	924	0	0
B. E. Nightingale	936	0	0

For Carrying Out Works in Connection with the Drainage and Sanitary Arrangements at Board Schools, Hackney.

McCormick & Son	£2,712	0	0
Knight & Son	2,358	0	0
W. Downs	2,169	0	0
Calnan & Co.	2,118	0	0
Williams & Son	2,059	0	0
Staines & Son	2,055	0	0
J. Marsland	2,055	0	0
Stevens Bros.	1,974	0	0
E. Triggs	1,934	0	0

For Provision of Manual Training Centre in Connection with Brackenbury Road School, Hammersmith.

G. Lyford	£1,287	0	0
S. Polden	1,189	6	0
Cowley & Drake	1,122	0	0
F. T. Chinchin	1,048	9	3
G. & F. Kent	958	0	0

For Provision of Laundry Centre in Connection with Sleaford Street School, Battersea.

W. & H. Castle	£927	18	0
W. Hammond	856	0	0
L. Whitehead & Co.	659	0	0
W. Akers & Co.	620	5	8
Lathey Bros.	580	0	0
G. & F. Kent	548	0	0

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For the Reconstruction of Theatre Destroyed by Fire. W. A. Peters & Sons.

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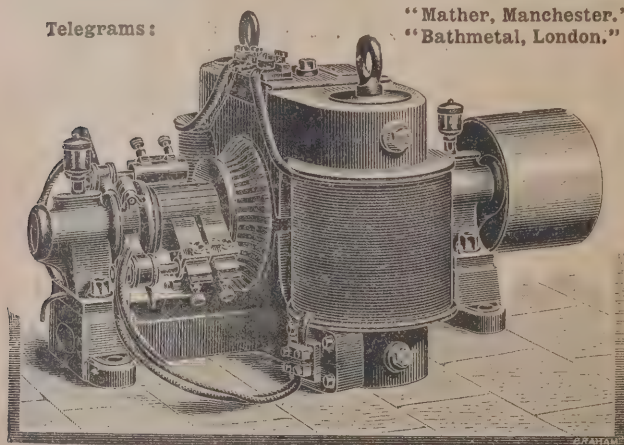
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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SUPPLEMENT

MACROOM.

For Building Labourers' Cottages in Divisions of the Union, for the Guardians.

D. Leary, Macroom	£180	0	0
D. McCarthy, Mountrivers	88	0	0
W. Cotter, Ballingearry	87	0	0
J. T. Dinan	85	0	0
D. McCarthy	85	0	0
M. Kiely, Kilcullen	85	0	0
J. T. Dinan, Gowlane	84	10	0
M. Creedon, Ballingearry	81	0	0

MEOLE BRACE.

For Building Cottages, now in Course of Erection, Exclusive of Glazing, Painting and Inside Plumbing. Messrs. A. B. & W. SCOTT-DEAKIN, Architects, Shrewsbury.

Salter & Son, Shrewsbury	£525	6	4
W. Swain, Shrewsbury	486	0	0
T. Pace, Shrewsbury	445	0	0
T. Morris, Shrewsbury	439	0	0
R. EVERALL & SONS, Shrewsbury (accepted)	430	0	0

NORWICH.

For New Roof and Floors and other Works at the Workshops, St. Andrew's, for the Guardians of Norwich Union. Mr. J. B. PEARCE, Architect, Upper King Street, Norwich.

J. Holmes, White Lion Street	£375	0	0
Bagley, St. John's	354	0	0
J. Barnard, Dereham Road	338	10	0
S. Chapman & Son, Rupert Street	329	0	0
H. Lacey, King Street	315	0	0
J. Downing & Son, Victoria Street	299	0	0
H. Barnes, Union Street	286	10	0
Sendell, Fishgate Street	285	0	0
G. Plumb, York Street	276	0	0
A. Brown, Dereham Road	274	10	0
W. NORTH & SON, St. Stephen's Street (accepted)	274	0	0

ORPINGTON.

For Additions and Alterations to Private Residence, Orpington, Kent. Mr. ST. PIERRE HARRIS, Architect, &c., 8 Ironmonger Lane, E.C., and Orpington.

Somerford & Son	£109	0	0
W. OWEN (accepted)	65	0	0

ORPINGTON—continued.

For Erection of New Building in Connection with the Village Hall, Orpington, Kent, for Mr. A. Brown. Mr. ST. PIERRE HARRIS, Architect, &c., 8 Ironmonger Lane, E.C., and Orpington. General Building Works.

W. Owen	£110	0	0
SOMERFORD & SON (accepted)	99	0	0
Ironwork.			
W. HARBROW (accepted)	212	0	0

PLYMOUTH.

For Rebuilding Aerated Water Factory and Premises, Green Street, Plymouth, for Messrs. Biscoombe & Son. Mr. J. H. KEATS, Architect, Plymouth.

P. Blowey, Plymouth	£1,350	0	0
A. R. Lethbridge & Son, Plymouth	1,325	0	0
T. May, Plymouth	1,286	0	0
J. Palmer, Plymouth	1,282	0	0
J. Taylor, Plymouth	1,197	0	0
A. N. Coles, Plymouth	1,177	0	0
Wakeham Bros., Plymouth	1,169	0	0
W. Blake, Plymouth	1,115	0	0
T. Pearn & Son, Plymouth	1,025	0	0
Tozer & Son, Plymouth	973	0	0

REDRUTH.

For Construction of Storage Reservoir, Intake Works at Lower Penstruthal and Gordon, Cast-iron Mains, and Laying, &c. Mr. H. BERTRAM NICHOLS, Engineer, Birmingham.

Godfrey & Co., Westminster	£14,215	15	0
Garlick & Horton, Limited, London	14,198	3	8
J. Dickson, St. Albans	11,785	0	0
W. Trevena, Plymouth	9,979	0	0
W. Shaddock, Plymouth	9,672	0	0
E. Duke, Plymouth	9,556	0	6
W. B. Berry, Crediton	9,469	3	0
H. Roberts, West Bromwich	9,377	0	0
G. Shellabear, Mutley	8,990	0	0
Clay Cross Co., Chesterfield	8,569	15	8
H. Weldon, Birmingham	8,413	1	3
W. Jenkins & Son, Leamington	7,977	0	0
W. Thomas & Son, Camborne	7,765	15	0
J. Julian, Truro	7,695	0	0
J. Shaddock, Mutley	7,680	0	0
J. W. Fereday, Wednesbury	7,566	0	0
A. DELBRIDGE, Camborne (accepted)	7,301	11	0

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RUNNEY.

For Erection of New Board Schools and Teacher's Residence, Runney, near Frome, Somerset. Mr. E. LINGEN BARKER, Architect, Hereford.			
T. Parfitt, Frome	£1,873	8	6
G. H. Wheeler, Abingdon	1,685	0	0
G. H. Wilkins, Bristol	1,604	3	7
S. Harding, Frome	1,596	0	0
MacAndrews & Co, London	1,590	0	0
Love & Waite, Bristol	1,565	0	0
F. J. Seward, Frome	1,549	10	0
E. Chancellor, Bath	1,507	0	0
W. Dowland, Abergavenny	1,480	0	0
C. BARNES, Frome (accepted)	1,250	0	0

SALISBURY.

For Building Three Houses, Winchester Street, Salisbury, for Mrs. George Main. Mr. ALFRED C. BOTHAMS, Architect, 39 Castle Street, Salisbury. Quantities by the Architect.			
F. Dibben, Salisbury	£1,430	0	0
H. J. Kite, Salisbury	1,383	0	0
E. Hale, Salisbury	1,334	0	0
Wort & Way, Salisbury	1,333	10	0
E. Witt, Salisbury	1,281	10	0
G. HARRIS, Salisbury (accepted)	1,240	0	0

SANCREED.

For Additional Wing to Catchall Dairy, Sancreed, near Penzance.

Whole Work.

T. James, Penzance	£154	0	0
J. Hosken & R. McLary, Drift	150	10	0
R. McLary, Drift	150	0	0
J. E. HOSKEN, Drift (accepted)	131	15	0

Mason's Work.

J. Lugg, Sennen	130	0	0
J. H. Nicholas, Penzance	114	0	0
J. S. Tregenza, Paul	99	0	0

Carpenter's Work.

A Chapman, Penzance	42	10	0
W. C. Matthews, St. Buryan	40	10	0
T. James	40	0	0
J. Leggo, Madron	39	17	6
J. E. Hosken	32	10	0

SEAFORD.

For Construction of Pipe Sewers, with Manholes and Lamp-holes, for the Seaford Local Board. Mr. B. A. MILLER, Surveyor.			
Steer, East Grinstead	£690	0	0
Berry, Seaford	683	10	0
Piper, Hastings	630	0	0
Fry Bros., Greenwich	610	0	0
Bell, Tottenham	599	0	0
Saunders, Bournemouth	539	0	0
Engineer's Estimate	650	0	0

SHREWSBURY.

For Shop Front and Alterations to 6 Castle Street, for the British Workman's Public-house Company. Messrs. A. B. & W. SCOTT-DEAKIN, Architects.			
H. Farmer, Shrewsbury	£393	0	0
W. Bowdler & Co., Shrewsbury	350	0	0
H. Price, Shrewsbury	279	0	0
R. Price & Sons, Shrewsbury	255	0	0

SURBITON.

For Shop-fittings, &c., to Premises at Surbiton, for Messrs. Rabbits & Sons, Limited. Mr. A. G. HENNEL, Architect, Forest Hill, S.E.			
Holloway	£464	0	0
Burman & Sons	460	0	0
JOHNSON & Co. (accepted)	420	0	0

WESTON-SUPER-MARE.

For Building Congregational Schoolroom, Moorland Road, for the Committee. Mr. W. J. SPENCER, Architect, James Street, Weston-super-Mare.			
W. M. Dubin	£375	0	0
C. Addicott	324	5	0
C. Taylor	310	0	0
T. Allen	299	13	6
T. VICKERY, Weston-super-Mare (accepted)	298	10	6

At the meeting of the Burntisland Harbour Commissioners plans were submitted for new deep-water docks at Burntisland, prepared jointly by Messrs. Meik and the harbour engineer. The probable cost of alternative schemes ranged from 200,000l. to 300,000l. Owing to the effects of the strike it was agreed to postpone further proceedings in the matter till another year.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.
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SIEMENS' BURNERS, 23 calories per candle per hour.
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TRADE NOTES.

MESSRS. JEFFREYS & Co. write us:—We note that in your article on the Architectural Association's *Conversazione* you mention our exhibit, but say, "contrary to their usual custom, the designers' names were not apparent." We would point out that this is a mistake, as our screens of wall-papers, and also our panels of embossed copper friezes, were ticketed with our cards, on which the names of the designers were distinctly written. Your representative may have only noticed two of our pattern-books, which did not happen to have the designers' names on, but on our principal exhibit we made a point of giving all the designers' names, according to our general custom.

THE church schools, Wrangthorn, Leeds, are being warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE are informed that Mr. R. L. Huxtable, of 10 Arthur Street West, E.C., has recently been appointed sole London agent for Messrs. Parkers, Limited, wood mantel and overmantel manufacturers, Birmingham.

FOR some time past a considerable portion of the South Quay wall at Ayr Harbour has been in a dilapidated condition, part of it having tumbled into the river. The harbour trustees have taken in estimates for having the wall rebuilt, and the successful contractors, Messrs. H. Kennedy & Son, Partick, have now commenced work. The extent of wall to be built is 376 yards, and the contract amounts to 21,022*l*.

IT is stated that Messrs. Kynoch & Co., of Birmingham, of which Mr. Arthur Chamberlain, brother of Mr. Joseph Chamberlain, is the managing director, have decided upon the establishment of a cordite factory in Ireland. The firm has lately received an order for 600 tons of cordite from the War Office, and they are about to apply to the Government for sanction to build a factory in the South of Ireland. It is proposed to acquire about 300 acres of land.

IT is proverbial that all work and no recreation has a dulling effect on the best of men. Messrs. W. & G. Ashford, Essex and Kent Streets, Birmingham, has sent us a list of golf clubs and appliances, just issued by them. In it are details as to appliances of every kind, and each kind is shown in so many varieties that it is not easy to see something is not to be found to meet not only individual requirements but even individual idiosyncrasies.

VARIETIES.

A VERY beautiful work has just been printed and published by J. L. Allday, Shakespeare Press, Edmund Street, Birmingham. The value of the work is, however, not to be measured by the price—one shilling—for few would have undertaken to give the public such a publication at, as some would say, so impossibly a small price. The work is entitled "Shakespeare's Stratford: A Pictorial Pilgrimage," by W. Hallsworth Waite. In the preface Mr. H. I. D. Ryder too much depreciates the letterpress, modestly intimating that it must be tolerated, as the letterpress accompanying the work of the artist's pencil stands in the same relation as many a libretto to a musician's opera. It will be found, however, that notwithstanding that it is supposed there is nothing new to be recited about Shakespeare and Stratford, that the public will by perusal find a fund of information that may be unknown to them. Any one who is acquainted with Stratford-on-Avon can testify to the fidelity of the pictures. As to the excellence of the reproduction of the numberless views, we cannot give higher praise than to say the work tells its own tale in that respect.

IN the next number of the *Artist, Photographer and Decorator* will be several important reproductions of Sir E. Burne-Jones's work, and a full-page reproduction of a valuable drawing by Mr. Ruskin, drawn between the years 1843 and 1845, when Mr. Ruskin was occupied upon his "Modern Painters," which is now published for the first time. In an early issue will also commence a series of invaluable reproductions from a sketch-book by Michael Angelo, which has been placed at the disposal of the proprietors by a private collector. These sketches have, up to the present, never been reproduced.

THE *Chester Chronicle*, in regard of the proposed refuse-tip at Sealand, says, at a special meeting of the Town Council, held privately in general purposes committee, it was unanimously decided to purchase 418 acres 2 roods 24 perches of land at Sealand, at a cost of 27,000*l*., without obtaining sanction for a loan.

THE London County Council have decided "That it be referred to the Public Health and Housing Committee to consider and report whether in certain cases the open gratings to the sewers in the public highways constitute such a danger to the public health as to render it desirable that the Council should consider the question of whether a remedy can be provided."



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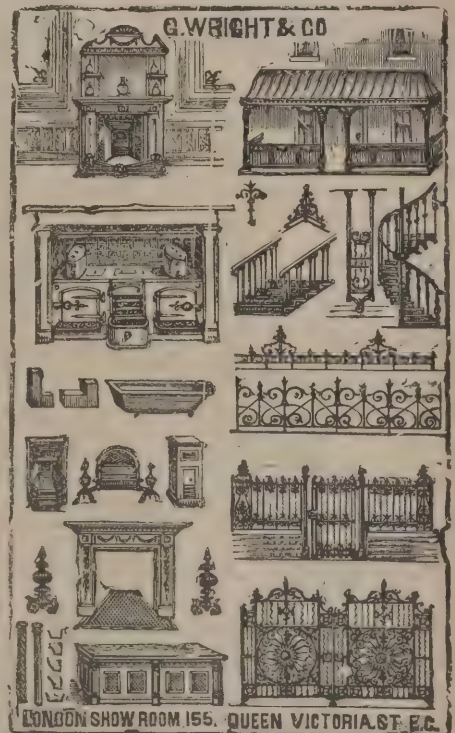
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"Burton Weir" Tile Panels and Hearths.

"THE GOLD MEDAL RANGE,"

With Lifting Fire.

WORKS, ROTHERHAM, Estab. 1854.

THE Great Eastern Railway Company are putting on a fourth steamer, to meet the increasing traffic between Harwich and the Hook of Holland, the *Vienna*, and, like its sister ships, fitted with all latest improvements and a life-belt for every passenger. The new boat is a twin-screw steamer of 1,745 tons and 5,000 indicated horse-power. At a trial 29 knots were covered in 95 minutes, the average hourly speed therefore being a little more than eighteen knots.

THE directors of the London and Lancashire Fire Insurance Co. have declared an interim dividend of 3s. per share (being at the same rate as the last interim dividend), payable on November 7, 1894.

THE surveyor of Worthing has been able to stop the waste of water in the town, which amounted to 197,520 gallons daily.

CLARIDGE'S HOTEL, in Brook Street, is immediately to be given over to the "housebreaker," and to come down. The site has been acquired by a syndicate, and a vast new hotel, built on modern principles, will be erected.

ESTIMATES and plans have been adopted by the Liverpool Corporation library committee for building a library at the north end of the city at a cost of 10,000l.

AN inquiry has been held at Portishead in regard of an application by the Local Board to borrow 14,000l. for works of sewerage and sewage disposal. Mr. T. J. Moss Flower, engineer, designed the scheme.

THE Galashiels Corporation have decided to construct a bridge over the river Gala, to provide direct communication between the east end of the town and the Melrose district.

ELECTRICAL.

IMPROVEMENTS are to be carried out at the Theatre Royal, Leeds. Amongst works which will affect nearly every portion of the auditorium and its approaches, it is proposed to alter to some extent the pit, boxes and circle in order to afford a better view of the stage from these parts of the house. There is also to be an installation of electric light; and a series of automatic sprinklers is to be provided in every part of the building so as to afford greater protection against fire.

ON Tuesday the chairman of the markets and fairs committee (Mr. Parkes) attended at the Market Hall and switched on the electric light, which is to be used for the illumination of the whole of the building.

AN inquiry has been held at the Town Hall, Whitehaven, in reference to the application of the Whitehaven trustees for sanction for power to borrow 6,304l. additional money for electric-lighting works.

WORKS of renovation, extension and improvement of a very extensive character are being carried out on the Duke of Sutherland's Trentham estate, involving an estimated expenditure of 20,000l., and providing employment for upwards of 400 hands. One of the undertakings is the lighting of Trentham Hall by electricity. Water from the Trent, which flows close by the hall, will supply the power for working the dynamos, the waterway having to be deepened and adapted to this purpose.

BUILDING AND BUILDERS.

AT the meeting of the Coventry City Council a memorial was presented from the Coventry and District Master Builders' Association asking for a revision of the building by-laws, with a view to render them more reasonable and workable, as at present they were obnoxious and irksome, and tended to discourage building enterprise.

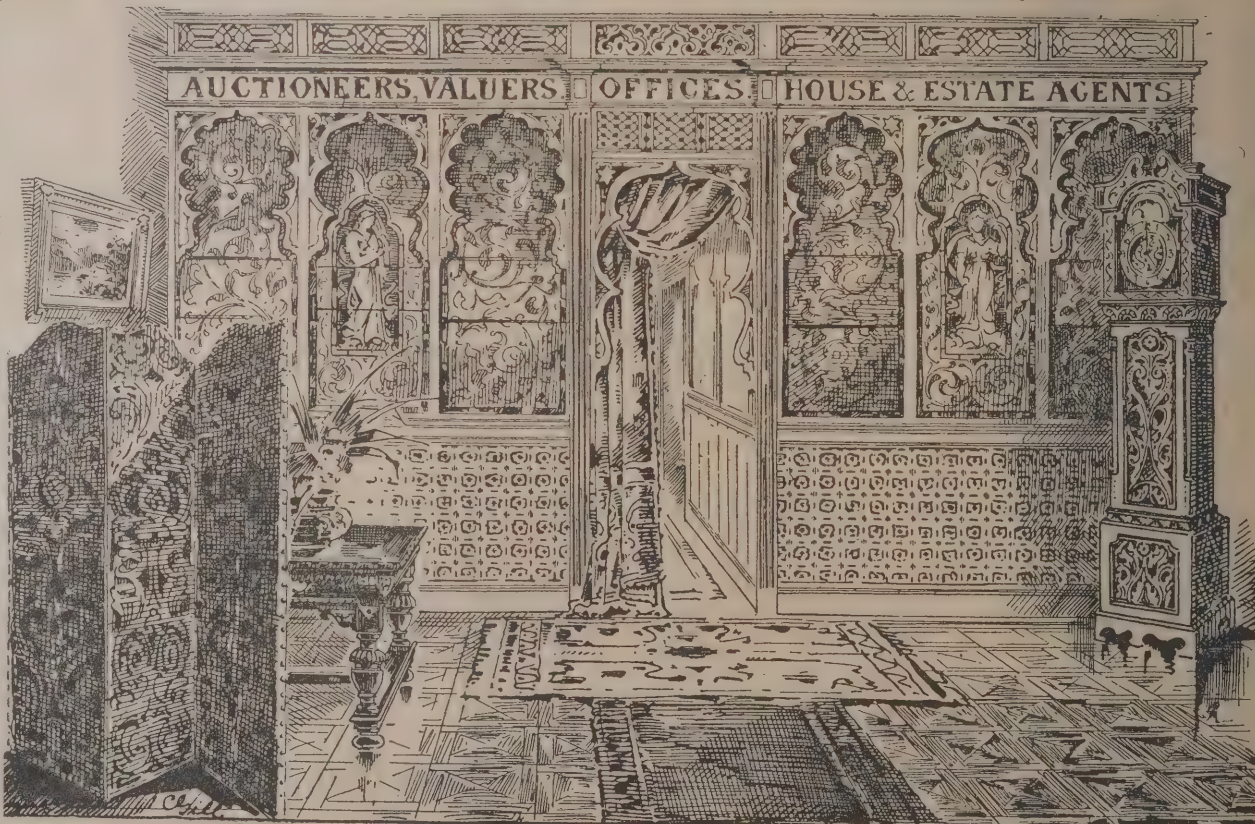
AT the meeting of the Glasgow Dean of Guild Court plans of the following buildings were passed:—Five tenements of shops and dwelling houses, to be erected in Bain Square, Gallowgate, by the City Improvement Trust; tramway stores to be erected in Pollokshaws Road by the Corporation; tenements of shops and dwelling-houses to be erected at corner of Parliamentary Road and Catherine Street by George Kerr, builder; new sanitary chambers, three storeys in height, and costing 17,500l., to be erected at corner of Montrose Street and Cochrane Street by the Police Commissioners; a two-storey villa in Nithsdale Road, to be erected by George Hamilton, builder, Dumbreck. Sanction was also given for the alteration and extension of the Clydesdale Ironworks, Possilpark.

THE *Birmingham Post* says:—A hitch has occurred in the arrangements for erecting the new meat market and slaughter-houses in Bradford Street. The tenders for the buildings, ten in number, were opened at the meeting of the markets and fairs committee, but in every case the amount of the tender was in excess of the amount (45,000l.) authorised by the Council as the expenditure on this portion of the scheme. The tenders were referred to a sub-committee, with a view to see whether any modifications of the scheme can be adopted to bring the work within the estimate.

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SUBSIDENCES IN GLASGOW.

AT the sitting of Glasgow Dean of Guild Court, Messrs. Barlas & Murdoch, builders, reported that they had examined two tenements of dwelling-houses situated at Nos. 3 and 5 and No. 9 Glasgow Street, Hillhead. The houses, which are much rent, were examined by Mr. John Whyte, master of works, and a second inspection showing sufficient cause for reasonable apprehension that one of the tenements, which is four storeys in height, was in a dangerous condition, the tenants were ordered to leave. The houses are situated on the south side of Glasgow Street. The subway passes underneath the centre of that thoroughfare. A subsidence had taken place at 227 Argyll Street. The premises are situated on the south side of the street, underneath the Caledonian Railway Bridge. The west side of the window sill has subsided, leaving a space of about 2 inches between the glass and the woodwork underneath, and the brickwork below is out of line to a similar extent. The upper part of the window has been boarded across, and a seam has opened in the sash. The subsidence has been taking place gradually. Mr. John Whyte, master of works, having been informed of the occurrence, made an inspection of the place.

LIVERPOOL MASTER BUILDERS.

THE Liverpool Master Builders' Association have just held their annual meeting at their offices, 6 Lord Street, Mr. J. Sirett Brown, presiding. The report and accounts for the past twelve months were read and adopted, and the officers for the ensuing year were appointed, with Mr. Wm. Hall as president. The

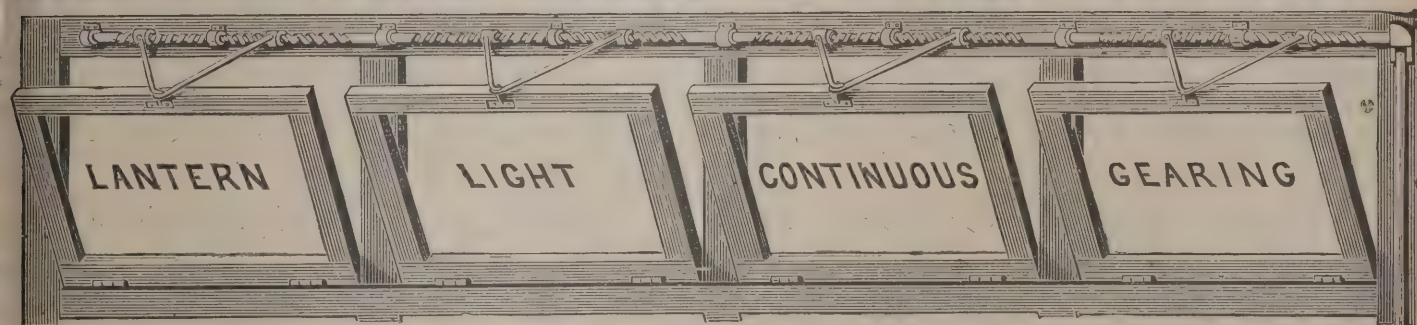
report states that the notices received from the various branches of the building trade for advances in wages, reduction in working hours and alterations in trade rules have all been settled amicably, and that all the trades (with the exception of the masons) are now working to a uniform code of rules. Last autumn notices were received for a reduction of the working hours and an advance in wages from the bricklayers, plasterers, slaters, plumbers and painters, and also from the bricklayers' and plasterers' labourers, and the committee considered this a good opportunity for endeavouring to effect such alterations in the general rules as to make them applicable to all the various branches of the trade. The masons and carpenters and joiners were working virtually the hours the other trades desired, viz. what is popularly called the nine hours' system, but to effect a uniform code of rules it was necessary to serve them with a notice of the proposed new rules, which was done. These rules were drafted by the committee and submitted to a special meeting of the Association and approved of.

THE APPOINTMENT OF CLERK OF WORKS.

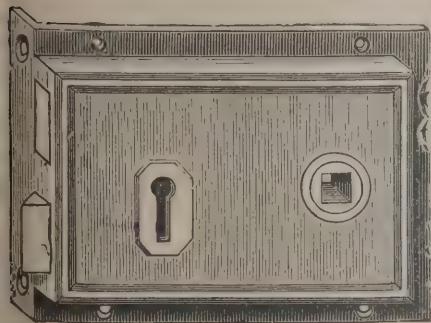
AN interesting and important case to architects, surveyors, &c., was heard at Crediton (Devon) County Court on Monday, before Judge Edge. The action was one involving the right of appointment of clerk of works. Mr. S. Hooper, architect and surveyor, Hatherleigh, claimed 6*l.* 16*s.* 6*d.* from Bow (Devon) School Board, balance due on a bill in respect of work in connection with the erection of new classrooms at Bow. Mr. G. Hooper, Dane's Inn, W.C., appeared for plaintiff; Mr. Pope for defendants.

Mr. Hooper said in April last year the defendants, who were members of the Bow and Nymet Tracey School Board, wrote to Mr. S. Hooper, asking him to visit Bow to prepare plans and superintend work in connection with erection of new classrooms. The result was that the work was carried out under plaintiff's supervision, agreement being that he should be paid on same lines as for previous professional services. When the work was completed, plaintiff sent in his bill for the total charge of 25*l.* The Board repudiated one of the items, but Mr. Hooper declined to go into the question with them, on the ground that he was practically an arbitrator. The Board consulted a firm of solicitors, who took the same line, and offered to pay the account less 10*l.* Plaintiff

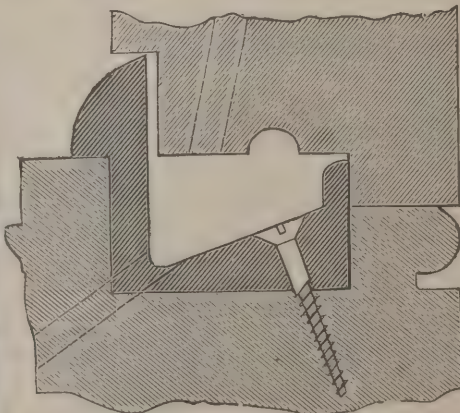
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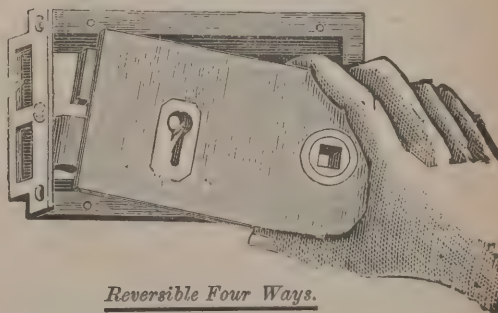
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declined to discuss the matter between the Board and the contractors, as he checked the latter's accounts and awarded the balance. The Board refused to pay the balance unless he deducted 10%, because, they alleged, he had awarded the contractors more than was fair. An action was commenced in the High Court for the recovery of the money. The defendants paid into Court 187 4s., and objected to paying the cost of clerk of works. In their affidavit they stated that if a clerk of works was required, the Board would be able to appoint one, but no request was made to the Board, and they were not aware that any had been appointed until after they received the plaintiff's account. The whole question at issue was whether Mr. Hooper was entitled to charge 6% 16s. 6d., the balance now sued for in regard to the clerk of works. The contract amounted to 250%. In filling in the usual printed form to the Education Department Mr. Hooper included 6% 10s. for clerk of works, and that was a portion of the amount borrowed from the Department. From that form the Board could have seen that the 6% 10s. would have to be paid, and no question was raised in the matter till the account was sent in. Plaintiff, in the course of his evidence, said he went to the works six times, and the clerk of the works ten times. It was a common thing to appoint a clerk of works in small jobs of this description. The first clause of the specifications contained words to the effect that the work had to be carried out to the satisfaction of himself or of his "clerk of the works." He employed his brother, a draughtsman in his office, as clerk of the works. He did not tell the Board that he intended to appoint him. If a clerk of the works had been appointed to reside at the place during the work, the cost would have been 50%.

In defence it was submitted that Mr. Hooper was employed as an architect, and in the application which the Board made to the Education Department they provided for what would probably be required. Consequently they arranged to have, if found necessary, a clerk of works, but at the same time they claimed their right as employers to make the appointment. The Board did not authorise Mr. Hooper to appoint one without bringing the matter before the Board. There was a distinct verbal stipulation that there was to be no clerk of works appointed by the architect. The Board intended to appoint a mason in their own parish to the post, but the man happened to be on the club books, and was unable to take the post.

The Judge: Then you wanted a clerk of works?

Mr. J. Crocker, F.R.I.B.A. (Exeter), said it was an invariable custom for architects to consult clients as to the employment of

a clerk of works, who was essentially an employé of the owners. Cross-examined: If an account for a clerk of works was included in the conditions, and they were read over to the owner, he should say it would be binding on the latter.

The School Board then made a counter-claim for the same amount against Mr. Hooper for damages for negligent work.

Mr. Pope said the work was incomplete and inferior in many particulars, and the Board contended that it was the duty of the architect and clerk of works to see that the work was done in this respect properly.

Evidence was called as to the claim.

The Judge said there was no doubt the Board contemplated the possibility of having to employ a clerk of works, and having saved by plaintiff employing his clerk, they ought not to object to pay the out-of-pocket expenses. He gave judgment for plaintiff, with costs in both actions; costs to be on the higher scale if Mr. Hooper could show his authority to the registrar for such application.

RECOGNITION OF MERIT.

At the meeting of the Hornsey Local Board on Saturday, 20th inst., Mr. C. F. Cory Wright, J.P., presiding, and the following gentlemen present, viz.—Messrs. H. R. Williams, J.P., H. Harper, J. H. Wilson, W. T. Pascoe, W. Piercy, C. W. Pearson, H. Burt, J. H. Borley, S. T. Homewood, J. W. Bird, C. Catling, G. Downing, and R. Caldwell-Moore, with F. D. Askey (clerk), E. J. Lovegrove (engineer and surveyor), F. A. Coleman (assistant surveyor), L. J. Tatham (solicitor), F. Matthews (assistant clerk), and Dr. H. Clothier (medical officer), a presentation was made to Mr. T. de Courcy Meade, who attended to receive the resolution passed by the Board, regretting Mr. Meade's removal from the district, and congratulating him upon his appointment at Manchester, which had been engrossed on vellum and framed.

The Chairman said he had much pleasure in presenting the resolution, which had been framed, and which was unanimously passed by the Board in July last. It was but a slight acknowledgment of the long and faithful services Mr. Meade had rendered to the ratepayers of the district, and a small mark of the esteem in which he was held by the members of the Board. He hoped it would find a place on the wall of his office at Manchester, and so remind him of the time he had spent at Hornsey. He congratulated the citizens of Manchester in



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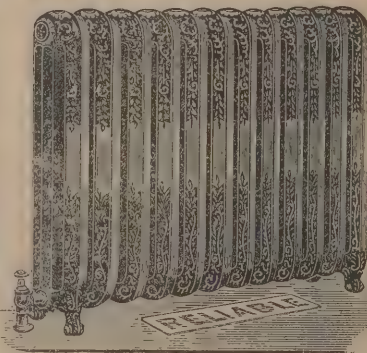
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having secured a surveyor of such ability and experience as Mr. Meade. He was pleased to think that Hornsey had been the means of furnishing the second city of the Empire with an officer of such skill, ability, conscientiousness, and of such high public character. He had the confidence of all of them, and he believed he would continue to keep it. He trusted he would have many years of happiness before him.

Mr. Williams said he could not let the occasion pass without making a few remarks. He thought Mr. Meade richly deserved his work to be placed on record. No doubt he would preserve this as a memento of his work in Hornsey, and of the esteem in which he was held by the members of that Board and the people of Hornsey generally. He was now filling a most important position. A most important committee meeting had been postponed to enable Mr. Meade to leave Manchester to come there that night, and he had no doubt his assiduity, his attention, and his ability would win for him the esteem of the people of the city of Manchester. The Corporation valued his services, and he was glad that Hornsey had been the means of furnishing that city with so able an officer.

Mr. Meade said it was with the profoundest gratitude that he came there to receive the testimonial. That was the proudest moment of his life. He had given fourteen years' service to Hornsey, and all that time he had received nothing but kindness from the present members of the Board and those who had left the Board. He should take away with him the kindest feelings for the district of Hornsey and the Board. He had used his best endeavours while there, and he was glad they were satisfied.

Each member of the Board and the officers present shook hands with Mr. Meade before he left.

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EDINBURGH DEAN OF GUILD COURT.

At the annual meeting of the Incorporation of the Guildry of Edinburgh Mr. Robert Miller was re-elected Dean. In his address the Dean of Guild first of all returned thanks for his re-election to office, and expressed his indebtedness to those gentlemen who had during the past year so faithfully and ungrudgingly given their valuable time and services as members of the Court. He had also to say, he went on, that their architects had given prompt, ready and intelligent attention to

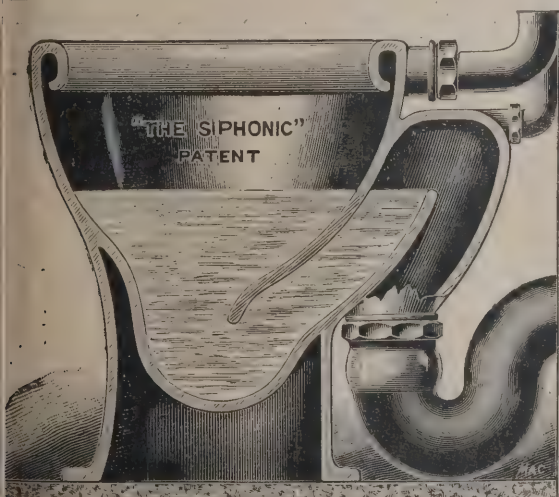
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the requirements of the Court in its administration of the building rules of the city. The harmony and the entire absence of friction which had prevailed proved that the Court and the architectural profession were working together for the common good in their efforts to provide sound and sanitary houses and buildings for the citizens. The fact that there had been few prosecutions for default also showed that their builders and plumbers, although strictly looked after in the execution of their work, were thoroughly alive to the necessity for good material and workmanship. The work of the Court furnished an index to the state of the building trade, just as the state of the building trade was an indication of the prosperity of the city. The work of the Court during the past year showed a considerable increase in the number of warrants granted for the erection of dwelling-houses, especially tenements. This year eighty-seven warrants for tenements were granted. Last year the number was fifty-seven and the previous year forty-nine. It was satisfactory to note a continuance of the improvement in the building trade. The number of first-class houses and villas authorised was seventy-two and the number of tenement houses was 753. Of these tenement houses 224 were houses of two rooms, 284 were houses of three rooms, and the remainder were of four rooms and upwards. It should be observed that no one-roomed houses were being provided. He found also that the lowest rent of the two-roomed houses was from 8*l.* to 10*l.* It was to be regretted that no new housing was being provided for the poor and labouring classes, the reason being that the speculative builder did not, and, he believed, could not, provide new one-roomed houses having the usual convenience and water fittings to each house, even if he could get land on which to build at a very small price or small feu-duty. The one-roomed houses were provided by the subdivision of existing houses, by the landlord letting each room to a separate family, the only outlay to him being the price of another key for the entrance door. The promotion of the city improvement scheme had brought this question to the front and he hoped something practical might be accomplished during the coming year. The Court was thoroughly alive to the adoption of any improvement likely to add to the comfort and promote the health of the citizens, and he might mention that the practice of forming small, dark enclosed bedrooms or bed-closets, just large enough to hold a bed, towards the centre of the house, was likely to be condemned and, as far as practicable, abolished. As to the improvements effected in the stairs of tenements for example, these were now in every case well-lighted and spacious and therefore sanitary. The extension of the city was at present chiefly westwards and north-westwards. Comely Bank, Coltbridge, Dalry and Slateford Road districts were gradually filling up to the city boundaries, and in some cases the housing was stretching beyond these boundaries considerably. An important question should therefore be raised at this time, when the amalgamation of parish boundaries and the adjustment of the same into a city parish, with boundaries coincident with those of the city, was being spoken of—the question whether the city boundaries should not be extended to include or nearly include St. Cuthbert's parish. This was all the more important as the question of providing suburban workmen's dwellings was coming to the front.

BETTERMENT IN NEW YORK.

THE Committee of the House of Lords on Towns Improvements (Betterment) were enabled to obtain the evidence of a distinguished expert, General Egbert Viele, respecting the procedure adopted in New York in settling public improvements. The following are the principal portions:—

Chairman, Lord Halsbury.

I understand you are a civil and municipal engineer?—Yes. And you have had various experiences in the United States and New York, have you not?—Some thirty or forty years. Are you State engineer of New Jersey?—I was State engineer of New Jersey.

And you are commissioner and president of the Department of Public Parks and a member of the United States Congress?—I have held those positions.

In the course of your experience have you had considerable dealings with various public and city improvements?—Yes.

Would you be good enough to give the committee the result of your personal and professional experience in connection with some of the public improvements in the city of New York as to the opening and extending of new streets, and the methods pursued in determining and collecting the costs as to them?—Yes. In order to do it as concisely as possible I refer to the atlas of the city of New York. This is the topographical atlas; the lowest part of the atlas is taken from the surveys of the Royal Engineers previous to the revolutionary war. The upper part is the result of a regularly adopted plan under the auspices of commissioners appointed for that purpose in order to correct the evils resulting from the irregular plan of

the lower portion of the city. The proceedings pertinent to this question in the city of New York are of two characters. One is simple and satisfactory, the other is the reverse, but they are due to the two different conditions of the older portion of the city and the newer portion. The opening of streets in the newer portions of the city are generally through territory not previously occupied except by large estates. The plan devised by the commissioners was laid down and monumented, so that under the future growth of the city, which for the last 200 years has been abnormal as regards all other cities in the world, the errors of the past should be remedied. Now in opening the new streets the operation is very simple. The owners of the abutting land on the line of the streets as laid down on the map are also the owners to the middle of the street, so that when the street is taken by the city in accordance with law, so that the city shall have the title in fee, the owners are assessed for that portion of the land which is taken, but they are paid also for it; so that it is simply a question of give and take, in order to secure the title to the city. The owners receive the street in front of them for access to their land, and virtually give the land. Frequently owners deed the land in advance so as to save all proceedings. That is very simple. The lower part of the city is where the difficulty arose of attempting to adopt the principle of opening new streets where it was densely populated. The growth of the city was so rapid and the trade increased so rapidly that it was necessary to widen a great many of the streets in order to secure, first, transit to the general public; and, secondly, proper access to the buildings and warehouses. A law was passed widening a number of those streets, and one of them was under my professional observation. The street was widened 20 feet on the southern side. It was half a mile long, the houses were three or four storey houses, and had been used for residential purposes, and the commissioners appointed were called Commissioners of Damage and Assessment. Those are the terms used there corresponding to what is spoken of here as betterment and worsement.

Marquess of Salisbury.

Are not "betterment" and "worsement" American words?—They are not our words at all. We do not know them in the English language in America; they are entirely foreign words to us. "Benefit" is the word we use, which seems to me better English and more direct. To the owners of the property which is taken an award is made for damages. The proceedings there begin with an application by the law officer of the city to the Supreme Court for the appointment of three commissioners as to benefit and damage. These commissioners being appointed, they select surveyors and appraisers, and proceed in the first place to determine the aggregate amount of damages, what is to be awarded for the land taken and what is to be awarded for the buildings that are destroyed. Having determined that aggregate amount of damage, they proceed to get the money under the principle of benefit. They soon find that the property along the line of the street cannot possibly pay these damages. They therefore resort to an arbitrary line on the hypothetical principle that within that arbitrary line the property is benefited. I am free to confess that the commissioners with whom I was associated recognised from the first that it was impossible to determine that the property outside of that line was really benefited. But they were obliged to get it; there was no other resource; so they drew this line, and they found when they came to spread the damages over it that that line was not wide enough, so they widened it again, and finally they got the money corresponding to the aggregate of damages. Then their report was taken to the Supreme Court for confirmation, and the property-owners outside of that line protested that they were not benefited; but after a long contention the report was adopted. Property-owners have the opportunity of going before the Court and before the commissioners to protest against any wrong or outrage; but the results showed that as soon as that street was widened and the owners had an opportunity of rebuilding the street (in fact, it was rebuilt with a line of marble-fronted warehouses some six storeys high) the increased taxes soon paid the cost of the damages. The taxation in New York corresponds to the improvements on the property, and the improvements on this property were so great that eventually the taxes amounted to as much as had been already paid for damages. But these persons had already paid an assessment for damages; therefore they paid twice, through the increased rates and through the charge for benefit. Outside that line there has never been any real contention that there was any benefit whatever to the people, but that the benefit was to the city at large, and that these people were charged merely to get the money for the damages. That principle works with great injustice, and is utterly unsatisfactory. In some instances it has amounted to a virtual confiscation of property in the hands of those who are unable to pay the assessment, and they have given the property up and let the city take it for the award which has been made against them.

Lord Kenry.

What street are you speaking of?—Worth Street, which is at present one of the best commercial streets in the city. Worth Street, in addition to being improved for ordinary use, connected two broad avenues which previously had no transverse connection, and at the same time destroyed what is known as the Five Points, which was the St. Giles's of New York, and created a great moral benefit to the city at large; but the city at large did not pay the tax. So great has been the injustice in connection with these things that there is a class of lawyers in New York who make it a business to relieve the property owners by discovering, if possible, flaws in the proceedings, and frequently the entire proceedings are set aside, the whole matter of assessment for benefit is referred to the city at large, and put into the general taxes. There are other improvements, such as parks and so forth, that are put entirely in the general taxes. Then there was a bridge which was under my supervision, as president of the parks, known as the Madison Avenue Bridge, which crosses the Harlem River, which occupies somewhat the same position as to New York that the Thames does to London. This bridge was paid for entirely from the general taxes, and not only the bridge but the approaches. It was understood that if by any chance the approaches to this bridge enhanced the value of the property along the line, that was entirely incidental and not a matter of certainty; so that the general tax paid not only for the construction of the bridge but for the land taken for the approaches.

Chairman.

But that was an example the other way, where the whole charge was thrown upon the whole community, was it not?—Yes.

Have you any other instance of an attempt to get the tax from the adjoining owners?—In the case of Riverside Avenue, where I reside, the construction of that improvement was charged entirely to the property owners by the commissioners. On an appeal to the Courts, half of that was put into the general tax, and we were relieved from half of the assessment. There are a great many narrow streets, perhaps ten of them, under precisely the same conditions as those to which I have referred with regard to Worth Street, and frequently the same property was assessed by this arbitrary line over and over again for another street opening which it had no direct connection with, which increased the injustice.

Have you, in your experience, been able to establish any principle by which that principle of benefit, as you describe it, can be assessed on particular owners?—The principle is, to my mind, a very simple one. If the property is benefited its rates increase, and the amount of money which is paid into the general tax eventually pays for the improvement. That was the case in Worth Street. If they had simply covered it by the general tax, and the general tax paid the whole improvement, eventually that improvement to Worth Street, and the increased taxation arising from the building of those marble-fronted stores, would pay back to the city the whole of that assessment. In the case of the Central Park, where 5,000,000 dollars were paid for improvement, all that has gone back into the general tax twice over, through the increased value of the general property surrounding it, and the increased taxation on that property has paid back that money to the city.

In your judgment, is there any relation between the proximity of a house to a bridge, we will say, and the value derived to the house from the bridge?—In the case of the Madison Avenue Bridge there was no hypothesis assumed that any house or any property would actually be benefited by that in the future, because it is impossible to tell what may occur, any more than to tell where the lightning will strike.

In your experience, has the anticipation of benefit been always realised?—On the contrary, it has been the reverse. Some streets are in the same condition as they were when the commissioners opened them, and no improvement has taken place, although they have paid the value of the assessment.

How is the value ascertained there; is it by a valuer valuing?—The commissioners have an appraiser; they sit and hear the property owners, and they decide as a jury.

Upon the evidence, I suppose, of persons skilled in the value of lands who prophesy what will happen?—Precisely so.

And in your experience you say the prophecies have not been verified?—Not at all; for the reason that a great deal of this property which was assessed for benefit was in no way connected with the street, nor in any way connected with the improvement.

In your view, is there any mode by which, apart from what you have described, namely, throwing the tax upon the whole community, you can suggest that the amount of benefit obtained by each individual owner could be ascertained, and accordingly assessed?—I do not think it possible that it can be ascertained; it is a matter of the future, which is a mere conception and not a reality until it does occur.

How many instances have you known, apart from those that you have given, in which there has been confident anticipation

of benefit that has not been verified?—I will answer that question by saying that an arbitrary line was taken merely to spread over a certain area the assessment, so that it might fall as lightly as possible on the different individuals; but the exact benefit that was to be derived by those different individuals was never attempted to be ascertained.

Marquess of Salisbury.

Or even estimated?—Nor even estimated in any way upon any one piece of property. It was merely divided over an area in radiating lines and on a sliding scale. The property furthest from it was assessed the least; the property nearest to it was assessed the most.

Were the lines circles?—They were really circles, although they were broken by the lines of street. They amounted to a circumvention.

A series of concentric circles were drawn, were they?—Yes.

With different rates on each zone?—Yes.

The different rate depending on the area or upon the existing taxation of the particular tenement?—On the area of the ground; the size of the lot, as we call it.

So much a square yard?—So much a square yard; the size of the lot.

Chairman.

In your judgment, is there any ground for supposing that that accurately conveys a notion of the benefit derived by the individual properties?—It does not.

Can you suggest any mode in which it could be done?—The only mode I can conceive is that it must be put upon the general tax, and the general tax would get it from the increased value of the property along the line of improvement whenever that might take place. If it does not take place it is an injury to ask for it.

Have you any other examples which you can give the committee in support of your views?—I have given a brief statement, but I could mention quite a number of parallel cases which are of the same character.

Resulting in the same experience?—Precisely the same experience.

Marquess of Salisbury.

Is this operation in conformity with the statute passed by the Legislature, or is it by the authority of any municipal body?—In conformity with the statute passed by the Legislature.

Earl of Onslow.

By the State Legislature I presume?—Yes.

Not by Congress?—By the State Legislature. All the laws concerning the City of New York are, as a rule, passed by the Legislature. The local authorities merely pass ordinances in conformity with those laws, but the Acts of Legislature govern the municipality.

(To be concluded.)

THE QUARRIES OF JERUSALEM.*

As there are no advancements on the agenda for this evening, I take the opportunity of giving you a brief description of a visit I paid a few years ago to the quarries of Solomon at Jerusalem, and hope that the account will not be devoid of interest to the members of the only Mark Lodge (so far as I am aware) which has borrowed its name from the scene of our ancient brethren's labours. Curiously enough our Masonic ritual refers the site of the quarries out of which the materials for the building of the Holy Temple were procured to Zeredathah in the Jordan Valley, but there seem to be no grounds whatever for the assertion. It is true that we are told in Holy Writ that it was between Zeredathah and Succoth that Hiram cast the two great pillars and all the brazen vessels and utensils required for the temple service, but the obvious reasons for that are twofold. First, because the clay ground there was and still is the most suitable for making moulds for casting, and second, because at that spot both water and fuel were more abundant than at any other place nearer to Jerusalem, which circumstances were sufficient to counteract the disadvantage of its being some forty miles as the crow flies from Jerusalem, and some 3,000 feet below the level of the summit of Mount Moriah where the temple was built, with only rugged mountain paths to connect the two places. Moreover, there are no traces of quarries having ever existed in that neighbourhood. The truth is, I suspect, that the apparent absence of extensive quarries in the immediate vicinity of Jerusalem puzzled the compilers of our ritual, and led them to adopt the only name definitely mentioned in the Scriptures in connection with the labours of Hiram, and ascribe to it the site of the temple quarries. Prior to the year 1852 the puzzle remained unsolved. In that year, however, a vast subterranean quarry, the entrance to which had

* A paper by Mr. O. G. Wood, W.M., read before the "Quarries" Lodge of Mark Master Masons, No. 468 E.C.

been buried for centuries under silt and rubbish, was discovered in the north-east of the four hills on which Jerusalem stands; and this is now generally believed to be the place out of which the Jerusalem of Solomon and perhaps some of the later kings of Judah was built. My first visit to this interesting spot was made in 1887, but I had the good fortune to explore it much more carefully in 1890 under the able guidance of Brother the Rev. J. E. Hassaner, of the Jewish Mission in Jerusalem, and his brother. The entrance lies on the north side of the city, a little to the east of the beautiful Damascus Gate, and as the debris and rubbish have now been cleared away from around it, laying bare the foundations of the present north wall of Jerusalem, and some of the bare rock of Bazetha, a visit to the quarries is a very simple matter, provided you have an efficient guide with you. Armed with lighted candles, matches, a quantity of magnesium wire and a small photographic camera, our little party passed through the low doorway into what appeared at first to be a yawning abyss of black darkness, and found ourselves in a gigantic cavern supported in places by rough and fantastic pillars of the natural rock. The direction of the cavern was southerly, and with a somewhat steep decline and expanding on both sides into a series of perplexing chambers and rough corridors, in the mazes of which it would be easy to lose your way and wander helplessly until some fortunate chance should put you right, or, as the evidence of a human skeleton proves, death should close the scene. Our conductor, however, knew every inch of the place, and all we had to do was to stumble and blunder after him as best we could over the rocky and uneven ground. When our eyes got a little more accustomed to the darkness we found that we were steadily descending into the very bowels of the hill, and were soon threading our way along devious passages between large and irregularly-shaped masses of rock, which had been left by the ancient quarrymen. A closer examination of the rock showed that the stone was not of equal hardness throughout, and consequently not of equal value for building, and the devious passages in the quarry were due to the hard limestone only ("mezzeh" I think the natives call it) having been utilised, while the softer quality of stone was neglected. Under our feet were thousands of loose fragments of stone, some fair sized boulders, some the mere chippings of the masons' chisels, indicating that the stones were dressed before leaving the quarry, while around us were half-modelled blocks, apparently rejected on account of some flaw detected after their separation. At other places

blocks partially detached projected from the walls, and at one spot a huge one projected downwards as if suspended from the roof of the cavern. Here we lit our magnesium wire and found that we had reached a vast hall, in one portion of which lay two ready squared ashlars. I wonder what story is attached to those great stones, which must have cost some ancient brethren many a day of toil. They had not been "heaved over among the rubbish," and yet the approving mark of the overseer was not on them. All round the walls and roof of this great hall were the marks of the little wooden edges, by means of which the blocks were separated from the rock, and here and there were small niches for the lamps, whose feeble light was sufficient to enable our ancient brethren to prepare those wonderful specimens of their skill, some of which may yet be seen in parts of the walls of the temple enclosure. It may perhaps be well here to explain the rationale of the wooden wedges. They supplied the place of gunpowder in ancient quarrying, and by their aid the hardest granite or syenite used to be blasted. Grooves 3 or 4 inches in length and at distances apart varying according to the splitting properties of the rock were cut with the chisel and wedges of dry wood driven into them. Water was then poured over the wedges, when the expansion of the wood split the rock and separated the blocks. All through the numerous quarries in Egypt the marks of these wedges are very plainly visible; the harder the rock the closer the wedges had to be placed to one another, and in the hard granite of Assouan in Upper Egypt only a few inches separated them. In Solomon's quarries the distance between the marks was much greater. An unsuccessful attempt having been made with the aid of magnesium light to photograph this great hall, we continued our descent through more devious passages until we reached the brink of an open pit some 18 feet square, nearly filled up with rubbish, rough chippings of stones, portions of rejected ashlars and other indications of the uses to which it had been put. We scrambled down and spent a few minutes stumbling about in it; but no skilfully finished keystone or graceful corner-stone now lay there to reward our search. Clambering out of the pit, we regained the hall, and then struck off to the left up a rather steep and very stony path until we reached a sort of passage running almost due south. This passage was evidently much resorted to by our ancient brethren, and the reason was soon apparent, for on arriving at the end of the passage we found a roughly-cut basin into which a tiny stream of water trickled from a slit in the rock, and here

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our ancient brethren must have come to slake their thirst when called off from labour to refreshment. We tasted the water, as in duty bound, but found it brackish and disagreeable. We had now exhausted the time we had to spare for this most interesting visit. As we slowly retraced our steps up the steep and rugged path, guided in part by the light of a candle which our conductor had placed upon a rocky eminence in a side branch while we were descending, the imagination busied itself in re-peopleing these dark caverns with busy quarrymen and skilful masons. We would fancy what the scene would be with thousands of little lamps occupying the niches in the walls and scattered about amongst the half-finished ashlar, casting their twinkling light on the swarthy figures of Jewish and Phœnician workmen toiling at their various labours. The ear conjured up the clink of the mallet and chisel and the hum of busy voices, sounding hollow and muffled in the gloomy caverns, mingled with the splash of the water on the wedges, followed by the dull thud of the falling masses of rock. And as at length we emerged into the bright sunlight, and the dream of anigh three thousand years old past faded suddenly at the sight of a group of sun-hatted and much be-puggared tourists nervously clinging to the saddles of their patient donkeys, I for one felt that the Mark Degree had assumed a new interest for me, and that its legend had become a living reality.

EASTBOURNE DRAINAGE.

A REPORT of Mr. Henry Law, C.E., who was consulted by the Eastbourne Corporation as to the best means of preventing the flooding of the town on the occasion of heavy rainfalls, has been sent in.

The present systems consist of high level and low level, and the high level is divided into three districts, namely, the Western, the Old Town and the Upperton. The drains from the three districts unite in one manhole, situated at the upper end of Terminus Road, opposite the railway station, their united discharging capacity being 6,258 cubic feet per minute. From this point the outfall drain, 3 feet in diameter, is carried along Terminus Road, Langney Road and Seaside to the Archery Tavern, and thence along the Wartling Road and across the Crumbles to Langney Point, where it discharges into the sea, but its inclination and discharging capacity vary greatly. The fall at the commencement is 1 in 700, and at the

end 1 in 1,572, while at one point between it is only 1 in 2,260. It receives the contents of three drains capable of discharging at the rate of 6,258 cubic feet per minute, but its discharging capacity at the outfall is only 915 cubic feet per minute, and along a portion of the route even less than that. Again, the free discharge of the outfall is stopped on the average 54 hours each tide, owing to the pressure of the sea, and when it is stated that on the outfall being tide bound and the three high level drains running full it only takes sixteen minutes to entirely fill the outfall drain throughout its whole length, the reason of flooding in a heavy rainfall is pretty evident. By the low-level system the Wish Valley and the Bourne Valley are drained. The areas lie at too low a level to be drained by gravity, and in each case the drainage is lifted by ejectors into the general gravitating systems. The chief point to note about the low-level system is that, whereas a portion of the outfall drain consists of a cast-iron pipe 4 feet 6 inches in diameter, falling 1 in 1,227, and capable of conveying 2,859 cubic feet per minute, the lower end consists of a brick drain only 3 feet in diameter, with an inclination of 1 in 1,212, and only capable of discharging 1,043 cubic feet per minute. Further, so low is the outfall that on the average it has a free discharge only eighteen tides (one-third) in the month. In addition to these systems there is the surface water drainage, by which a considerable portion of the rainfall running off the roads and roofs in the Wish Valley, Upperton and Old Town districts is carried away by independent drains.

What Mr. Law proposes is, first, to extend the system of surface-water drains in the Old Town and Upperton districts, the drains to discharge themselves into the Bourne stream or the watercourses which traverse the "Eastbourne Level." Secondly, to construct a new drain 4 feet 6 inches in diameter from the Railway Terminus to Langney Point, the upper portion passing along Terminus Road, Pevensey Road, Marine Drive, Seaside, St. Aubyn's Road and Latimer Road to the Wartling Road to be of concrete and the remaining portion of cast-iron. This drain would be watertight under pressure; it would have a uniform fall of 1 in 787.58 and a discharging capacity, when the lower end is free, of 3,570 cubic feet per minute. In addition to this new drain, Mr. Law would retain the existing high-level outfall drain as a kind of storm overflow, substituting, however, a cast-iron pipe 4 feet 6 inches in diameter for that portion between the Archery Tavern and Langney Point, which is in very bad condition. This new portion, with a free outlet, would discharge 2,646 cubic feet per

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Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
	Eiffel Tower, Paris
	Royal Military Exhibition, &c., &c., &c.

GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
SILVER MEDAL—PARIS, 1889.

minute. The manhole at the commencement of the high-level outfall he would have reconstructed so as to allow nothing to flow into the drain until the water had risen a certain height in the manhole, and then only permitting a regulated quantity to pass. With regard to the low-level outfall, he would substitute for the 3-feet brick portion a 4-feet 6-inch cast-iron pipe, and he would put two additional ejectors, having a capacity of 1,000 gallons each, at the Archery Tavern, with another set of compressors to enable them to be properly worked. These are Mr. Law's main suggestions, and he proceeds to argue in detail how the works proposed would be effectual in the prevention of flooding under the most unfavourable circumstances. The cost of the works he estimates at 75,000*l.*, but this does not include the cost of surface-water drains, which can only be ascertained by a detailed examination of each road and building. He says, however, that the works would suffice for many years, as in making his calculations he has had regard to the future, and they had been so planned as to admit of easy extension.

ELECTRICAL MEASUREMENT.

THE electrical standards committee have issued the following final report:—

Since the date of our last report the Board of Trade have laid before us a *résumé* of the action of the International Electrical Congress held in Chicago in August 1893, to determine the units of electrical measurement. We were also informed by the Board of Trade that Her Majesty's Government had been invited by the United States Ambassador in London to take steps to adopt the recommendations of the congress. These recommendations, so far as they refer to the units of electrical resistance, electrical current and electrical pressure, are substantially the same as those suggested for adoption in our previous reports. We see no reason for further delay in the legislation of standards of the above-mentioned units, and we have prepared and attach a revised draft Order in Council, which we advise may be submitted for Her Majesty's gracious approval. The accompanying notes to the specification for the Clark's cell have been communicated by Mr. Glazebrook, and will be found of great assistance in the preparation of this form of cell.—Courtenay Boyle, Kelvin, Francis J. S. Hopwood, P. Cardew, W. H. Preece, Rayleigh, G. Carey Foster, R. T. Glazebrook, J. Hopkinson, W. E. Ayton. T. W. Blomefield, secretary. August 2, 1894.

After giving the notes and the revised draft Order in Council, referred to above, the report sets forth the new denominations of standards for electrical measurement as follows:—

I.—Standard of Electrical Resistance.

A standard of electrical resistance denominated one ohm being the resistance between the copper terminals of the instrument marked "Board of Trade Ohm Standard Verified 1894" to the passage of an unvarying electrical current when the coil of insulated wire forming part of the aforesaid instrument and connected to the aforesaid terminals is in all parts at a temperature of 15.4 degrees C.

II.—Standard of Electrical Current.

A standard of electrical current denominated one ampère being the current which is passing in and through the coils of wire forming part of the instrument marked "Board of Trade Ampère Standard Verified 1894" when on reversing the current in the fixed coils the change in the forces acting upon the suspended coil in its sighted position is exactly balanced by the force exerted by gravity in Westminster upon the iridio-platinum weight marked A and forming part of the said instrument.

III.—Standard of Electrical Pressure.

A standard of electrical pressure denominated one volt being one hundredth part of the pressure which when applied between the terminals forming part of the instrument marked "Board of Trade Volt Standard Verified 1894" causes that rotation of the suspended portion of the instrument which is exactly measured by the coincidence of the sighting wire with the image of the fiducial mark A before and after application of the pressure, and with that of the fiducial mark B during the application of the pressure, these images being produced by the suspended mirror and observed by means of the eyepiece.

In the use of the above standards the limits of accuracy attainable are as follows:—

For the ohm, within one-hundredth part of 1 per cent.

For the ampère, within one-tenth part of 1 per cent.

For the volt, within one-tenth part of 1 per cent.

The coils and instruments referred to in this schedule are deposited at the Board of Trade Standardising Laboratory, 8 Richmond Terrace, Whitehall, London.

A note is appended stating that an Order in Council in the form given in the report was made by Her Majesty on August 23, 1894.

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THE EDINBURGH CATHOLIC APOSTOLIC CHURCH.

AN important piece of ecclesiastical decoration, says the *Scotsman*, has just been executed at the Catholic Apostolic Church, London Street, by Mrs. Traquair, whose painting of the cathedral song school of St. Mary's was so much admired. After Mrs. Traquair had finished that work, it was suggested to her that she might employ her talent for decoration on the Catholic Apostolic Church, the great bare wall spaces of which, left purposely to be painted when the church was built nearly twenty years ago by Dr. Rowand Anderson, have up to the present time never been dealt with. The church is Early Norman, and between the spacious nave and chancel there is a lofty arch, deeply moulded, which rises to a height of 66 feet. On each side of it and over it—the roof being 77 feet in height—is a wall area, which represents in extent a canvas equal to about 120 feet by 9 feet, and it is this space that Mrs. Traquair has successfully decorated. It was a task of no ordinary magnitude, especially for a woman—moving about as she had to do on high scaffolding, which had to be kept open to admit light from the side windows below it. In painting the spaces next the roof, Mrs. Traquair worked on a platform consisting of a couple of narrow planks, with a handrail at one side, and considerable nerve was needed to walk across the scaffolding, not to speak of being constantly upon it. But the enthusiasm Mrs. Traquair has for her art has carried her successfully through all the difficulties of this kind which menaced her, and she has finished, after fifteen months of constant endeavour, a series of mural paintings which may be regarded as quite a monumental work.

The design of the decoration is illustrative of the worship of heaven, as that is revealed in type and symbol chiefly in the Book of the Revelation. The two lower panels on each side of the arch—the one 7 feet 6 inches in depth and nearly square, the other about twice the size, though architecturally distinct—are decoratively associated together. The upper panels contain the four great cherubim (so constantly referred to in the Bible), which this religious body hold to be symbolical of the four modes of action into which St. Paul divides the orders of bishop, priest and deacon, viz. apostles, prophets, evangelists and pastors. They are represented by youth of noble mien with wings. The figures, nearly 10 feet high, admirably drawn, are arrayed in graceful draperies of different symbolical colours. Their faces are turned in the act of worship towards the altar, which has been taken as the central point of the design. Each

cherubim has below him, in the under panel, the corresponding symbol for the "Living Creature," which typifies his ministry as set forth in the visions of Ezekiel and St. John, and carries in his hand a type of his particular office. Thus, nearest the altar, on the "Gospel" side, is the apostolic cherubim, holding a golden crown, signifying rule and authority, which he is casting before the altar as an act of worship. The robes are of a golden hue, which in Scripture signifies the truth of God, and is the office of the apostle to declare. Below is the head of the lion, typifying the rule and majesty of apostleship. Next the altar, on the "Epistle" or left side, is the prophet clad in blue—the heavenly colour. He holds a golden harp, which suggests the imaginative and poetic singing of songs in the spirit. His symbol in the under panel is the eagle, typical of the prophetic ministry which soars into heavenly mysteries, and reveals them to men. Next in order is the Evangelist on the "Gospel" side, standing outside the apostle. This figure holds a Bible open at the text, "I am the resurrection and the life," and he points to the passage as if preaching from it. His colour is red, typical of the blood of the Redeemer, whose cleansing virtue the Evangelist is supposed specially to enunciate. The head of the living creature below him is the Man—to whose reasoning faculty this ministry appeals. Lastly, on the "Epistle" side, is the pastor standing outside the prophet. This figure carries in his right hand a pastoral staff, and in the left, breast high, a lamb. His colour is white or silvern, which symbolises the love of God. The living creature below him is the ox—the patient working animal of the East, a type of the domestic action of the pastorate of the Church. The living creatures of the lower panels have golden aureoles and wings, with eyes on the tips, and before them are suggestions of the mysterious "wheels" mentioned by Ezekiel. They are set against a purple background. The impressive figures of the youthful cherubim are painted against a deep blue sky, which is broken up by horizontal bands of white conventionalised clouds, and across them is thrown with admirable effect a rainbow, the arch of which has the tabernacle for centre. Above the cherubim—standing opposite the spring of the arch—is a choir of adoring angels in various coloured robes; and in higher spaces are a band of angels blowing long golden trumpets. At their feet white flowers spring. Carried from wall to wall at the height of the crown of the arch is a golden ledge, and above it are seen the four-and-twenty elders of the Revelation (4th chapter) seated on thrones and wearing golden crowns, golden stoles and purple

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copies, which typify the rule and authority of their office. Over each figure is a golden canopy. The Catholic Apostolic Church holds that these elders are the two bands of Apostles—twelve to the Jews and twelve to the Gentiles—the latter, it is believed, being in office now. Highest of all, grouped in the space under the roof in a descending lunette, is a throng of figures representing the multitude which no man can number, arrayed in white robes, with palms of victory and harps and trumpets in their hands.

The work alike in design and execution is of a very satisfactory nature. The design admirably blends the symbolism of the particular church in which the work appears with the more universal attributes of the worship of heaven, and it is pervaded throughout by a fine devotional spirit recalling early Florentine work. The figures are in excellent perspective. They are gracefully drawn, and while numerous are at no point overcrowded. The cherubim panels in particular are a masterly piece of work. The colouration is rich, transparent and happily blended. It may be explained that the colours are oil, but worked in the water-colour method. The walls were prepared by a thick coating of white paint, and the high lights are got by leaving this basis exposed instead of putting white above other colours. The colours, indeed, retain their transparency because they have not been mixed. Over the colour there has been put a coating of flat varnish, rubbed up with the hand to give what is technically known as an egg-shell surface, which can be easily cleaned. The gold of the aureoles, trumpets, ledges, &c. has in some cases a relief of 6 inches, and in consequence presents a massive appearance. The ledges, trumpets, &c. in the higher spaces are bevelled on the lower side, so as the more readily to catch the light, which all comes, as has been said, from below. The Catholic Apostolic Church being open every day from ten to six, this beautiful piece of work by this gifted artist can readily be seen by all interested in it. The younger artists especially should view it. The field is one they might cultivate with advantage. Mrs. Traquair is now preparing to continue the work of decorating the church by illuminating the walls of the chapel and north transept. After these are finished she means to tackle the large oblong panels of the nave. In connection with the mural paintings on the great arch, the roof of the chancel has also been decorated in a suitable manner. The principal feature in the scheme is a representation of the "Tree of Life" designed in the shape of a heart, the symbol of Charity. On the apex are tongues of flame, in gold, on a blue

ground—the whole design suggesting the four elements of fire, air, earth and water. The colours employed are the symbolical colours already named. The designs for the roof were prepared and carried out by Mr. Andrew Hutton, Dundas Street, who also grounded the walls for and varnished the mural decorations by Mrs. Traquair.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

19056. Walter John William Wheeler and Percy Charles Wheeler, for "Improvements in apparatus for curing smoky chimneys and for ventilating purposes."

19060. Arthur Frederick Borradaile, for "Improvements in window-blind pulleys."

19068. Edward Seaman, for "A self-acting window fastener."

19080. Gustave Falconnier, for "Improvements in or relating to the construction of transparent or translucent walls, ceilings, floors or the like."

19088. Thomas Bradshaw Jack, for "An improved syphon cistern."

19119. James Hall Foote, for "Improvements in pulley casing for window frames."

19120. Charles Hall, for "Improvements in clamps for pipes."

19180. Charles Alexander Balph and Elisha Pierson Swift Wright, for "Improvements in or relating to fireproof floors and ceilings."

19182. Henry Isidore Dakin, for "Improvements in water-closets and in pipe connections therefor and for other purposes."

19331. Anthony Roy Austin, for "Improved means for opening window sashes inwardly."

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[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

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ACCRINGTON.—Nov. 13.—For Pulling-down and Rebuilding St. James's Schools. Mr. Bell, 14 Grimshawe Street, Burnley.

ACTON.—Nov. 6.—For Making-up Various Streets. Mr. D. J. Ebbetts, Local Board Offices.

ALNWICK.—Nov. 2.—For Erection of Premises. Mr. George Reavell, jun, Architect, Alnwick.

ALNWICK.—Nov. 5.—For Building Five Houses. Mr. M. Temple Wilson, Architect, 69 Narrowgate, Alnwick.

BELFAST.—Nov. 5.—For Building Hospital. Mr. W. J. Fennell, Architect, 11 Chichester Street, Belfast.

BELFAST.—Nov. 8.—For Service Reservoir and Main Conduit. Mr. L. L. Macassey, Engineer, Waterworks Offices, Belfast.

BOWES PARK.—Nov. 8.—For Making Alterations at Bowes Manor. Mr. Wm. Smith, 65 Chancery Lane.

BURNWOOD.—Nov. 12.—For the Construction of Additional Wards at Staffordshire County Lunatic Asylum. Mr. Stanger, Queen's Chambers, North Street, Wolverhampton.

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CATFORD.—Nov. 6.—For Kerbing, Tar Paving, Metalling and Channelling Work. Mr. Edward Wright, Board of Works Offices, Catford.

CROYDON.—Nov. 6.—For Additions to Seven Blocks to Borough Hospital, at Waddon. The Borough Engineer.

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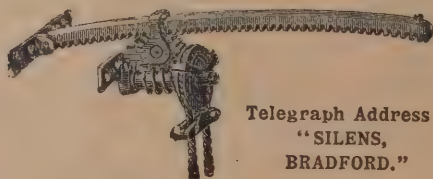
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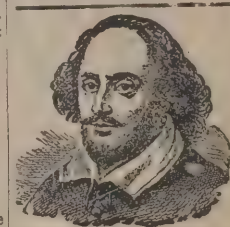
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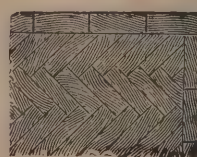
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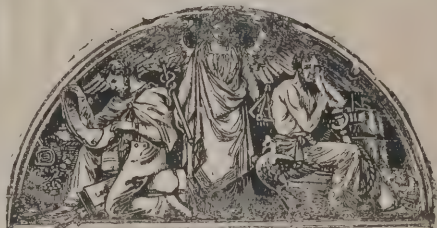
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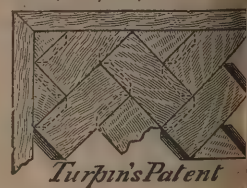
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TRADE NOTES.

THE Japanese boat s.s. *Islam*, belonging to the Japanese Government, which was recently detained on the Clyde by the orders of the British Government, has now arrived at Yokohama, and Messrs. Baird, Thompson & Co., Limited, have received a high testimonial concerning their improved mechanical system of ventilation introduced by them. This company at present are very full of orders, and lately have secured several very important contracts. Amongst other contracts just completed by them we may mention St. Bartholomew's Hospital, Royal Hotel Buildings, Grand Hotel Buildings, Burton-on-Trent Municipal Buildings, Lye Schools, &c. We may mention for the benefit of our readers that this company have at present in the press a new catalogue containing numerous improved designs of ventilators and other specialties. The work when finished will be a great improvement on previous catalogues, and we understand an important reduction in their prices have been made. An early application should be made for a copy.

At the meeting of the Preston Town Council it was agreed to accept the tender of the Stanton Iron Company, of Nottingham, of 21,394*l.* for the supply and delivery of water-pipes for the new storage reservoir which is being made at Alston, near Longridge.

THE Woodhouse Schools and the Normanton Common Schools for the Normanton School Board are being warmed and ventilated by means of Shorland's patent Manchester stoves, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

At the meeting of the Walsall Board of Guardians the tender of Mr. A. Lynex for the erection of the Workhouse Infirmary buildings for the sum of 6,526*l.* was accepted. There were nineteen tenders, ranging from 9,280*l.* down to 6,371*l.*

It is announced that Mr. S. P. Colman, the much esteemed local manager of the London and Lancashire Fire Insurance Company at the Birmingham branch, is, after thirty-one years of service, about to retire upon a liberal pension. Mr. Colman will be succeeded by Mr. Robert Rutherford Brydone, who, following upon a general varied experience of home fire business, has for the past three years occupied the position of manager of the London and Lancashire's business in South Africa.

A STAINED-GLASS window has been placed in the transept of the parish church at Dowlais, in memory of the late Mr.

J. R. Jones. The window has three lights, the centre subject being "The Resurrection;" in the left-hand light our Lord is depicted as "The Light of the World," and on the right hand as "The Good Shepherd." The work has been designed and executed by Messrs. Jones & Willis, of Great Russell Street, London, W.C.

THE Guildford Rural Sanitary Authority have adopted a scheme of sewerage and sewage disposal for Woking. Mr. Radford, of Nottingham, is the engineer.

A MEETING of the markets and fairs committee of the Birmingham City Council was held to consider the tenders sent in for the erection of the new meat market and slaughter-houses in Bradford Street. A week ago the tenders were opened, when it was found that the lowest estimate was that of Mr. John Bowen, which exceeded the sum of 45,000*l.* the Council authorised as the maximum for the erection of the buildings. The committee made certain modifications in their scheme which would have the effect of reducing the tenders. The committee decided to ask the Council at the December meeting for power to spend more than the 45,000*l.* on the buildings.

ACCORDING to the *Birmingham Post*, Messrs. Wood & Ivery, Limited, West Bromwich, have secured the order in connection with No. 2 contract of the Birmingham Water Scheme. This firm, who are reputed to be the largest manufacturers of blue bricks in Staffordshire, have booked an order from Messrs. Morrison & Mason, Limited, Glasgow, the contractors to whom the work has been entrusted, for over 4,000,000 of best pressed blue bricks, and 1,150,000 invert blocks and copings.

It is further stated in regard to the new railway to London that Messrs. Wood & Ivery, the Albion Blue Brick Works, of West Bromwich, have received large orders for millions of bricks to be used in the construction of the railway. The contracts for the undertaking are let out in seven sections, and the orders have been secured by the firm mentioned for bricks required in three or four of these sections.

At the meeting of the Lord Provost's committee of Edinburgh Town Council it was agreed to recommend to the Council that the offer of Sir William Arrol & Co. should be accepted for the erection of the new North Bridge. The estimate is said to amount to about 81,000*l.* It is understood that the sub-contract for mason-work has been given to Messrs. William Beattie & Sons, builders, Edinburgh.

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At St. James's Church, Wednesbury, Mrs. Chas. Prescott, of London, formally started a large clock, of which she is the donor. It has three dials, chimes the Cambridge quarters and strikes the hours. The whole of the work has been carried out by Messrs. John Smith & Sons, Midland Clockworks, Derby.

THE *Birmingham Post* says:—In reply to inquiries made at the Horseley Company's works, Tipton, our Dudley correspondent was informed by one of the principal officials of the firm that the statement which has recently been current in the neighbourhood that they had received an order for 35,000 tons of bridge-work, in connection with the extension of the Manchester, Sheffield and Lincolnshire Railway from Annesley to London, was incorrect, the contract placed with them, it was stated, not being one-fourth of this amount. A considerable amount of reserve was manifested in reference to the matter, the company's officials, declining to state the actual weight of the work to be executed by the company or its approximate value. It was ascertained, however, that the bridge-work in connection with the new railway has been divided among seven leading British manufacturers and that, although the order secured by the Horseley Company was an extensive one, it was not the largest. About 600 hands are at present employed by the company and, as the completion of the contract will extend over a period of two years, it is not anticipated that its execution will necessitate the employment of any additional labour.

We have much pleasure in announcing that Mr. John Grundy has been awarded the highest award at the Manchester exhibition for his patent smoke-consuming grates.

BUILDING AND BUILDERS.

THE laying-out of the Sparkhill Estate, near Birmingham, which has been in progress for some considerable time, is approaching completion. The local architect, Mr. J. Statham Davis, has already prepared plans, &c., for a large number of commodious villa residences thereon, and the total expenditure will probably exceed 100,000/. The contractors are Messrs. Hughes & Son, of Sparkhill.

A POLICE station is to be erected at Upper Wortley, Leeds, with accommodation for fire-brigade purposes.

At the meeting of the Edinburgh Dean of Guild Court a warrant was granted to the School Board for the erection of a

school at Broughton Road. The site of the new school is that formerly occupied by Blandfield House. Mr. R. Wilson, the architect, has taken advantage of a slope in the ground to form a basement floor at the back, in which there will be placed a swimming-bath and gymnasium. On the ground or street floor is to be the infant department, and on the upper floor that for juveniles, as well as rooms for the study of science and practical cookery. In the playground, occupying the front and sides of the school, a workshop will be located, while at the entrance gate is to be erected a janitor's house. Accommodation for 512 infants and 854 juveniles will be provided in the respective departments. The whole structure, which, with furnishings, is expected to cost between 23,000/ and 24,000/., is to be heated and ventilated in the most modern style. Renaissance, adapted to school purposes, is the style of architecture chosen by the architect. The contractor is Mr. William Gerard, Edinburgh.

THE *Leeds Mercury* says:—Messrs. B. Whitaker & Sons, of Horsforth, with the view of meeting the demand for good houses with country surroundings, and within easy access of Leeds, Bradford and other populous centres, are laying out their Hawksworth Wood Estate, of 200 or 300 acres, for the erection of some 300 modern detached and semi-detached villa residences, with a useful piece of ground to each. They intend to deposit the plans for approval at the Town Hall in a day or two.

VARIETIES.

AT a crowded meeting held at 40 Holborn Viaduct Mr. F. St. John Parker, president of the Society of Diplomatized Teachers, presented to the successful candidates sent up by the Yost school the prizes and certificates granted by the Society, including the Society's bronze medal to the competitor who took highest place in the examination in typewriting open to the whole country.

THE death which is announced of Mr. Thomas Warden, churchwarden of Holy Trinity Church, Stratford-on-Avon, is believed to be owing to the criticism and ridicule he incurred by reason of selling the doors of Shakespeare's church for firewood.

AT the meeting of the Bury Town Council the mayor, Mr. J. Ashworth, presented to the Corporation some seventy or eighty etchings and engravings, which were to be used, he stated, as "a sort of itinerant collection," to go round among

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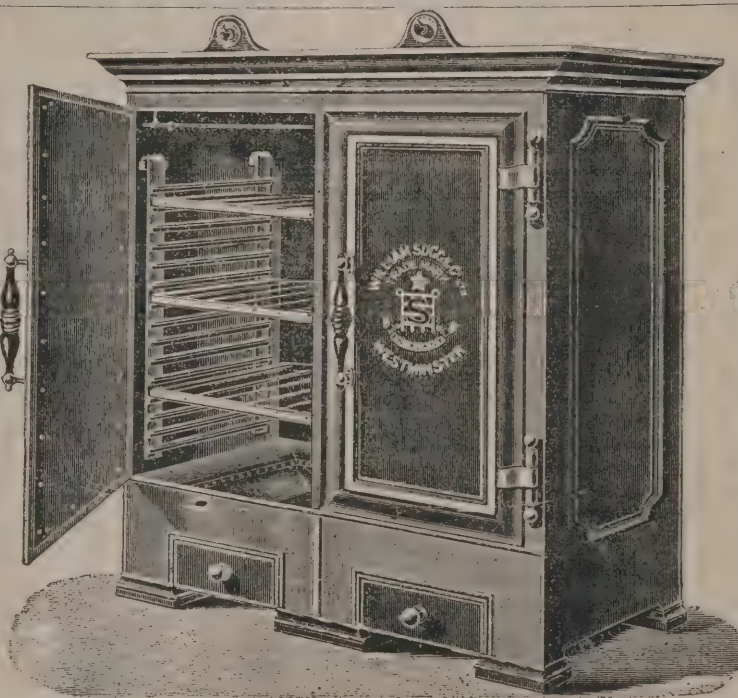
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the elementary schools of the district, the purpose being to assist in educating the eye and training the taste of the children.

THE *British Medical Journal* says:—The report of the law and parliamentary committee of the West Riding County Council states that in reply to communications from the committee, the Local Government Board had stated that they could not undertake to make special inquiry, with experiments, as to the action upon lead of water in the cases of all new schemes of water supply, as had been suggested by the committee, although they considered that it was a matter which should be carefully considered in connection with new water supplies. The committee, being of opinion, after conference with the sanitary committee, that the evil would be remedied by the substitution of iron pipes for lead, had directed the West Riding solicitor to communicate with the Local Government Board, requesting that steps might be taken to confer power on the County Council to prohibit the use of lead pipes in connection with any public supply of water which, when in contact with lead, might cause lead poisoning.

THE Secretary of State for Foreign Affairs has received from our Consul at Corunna a despatch announcing that the Spanish Minister of Public Works invites tenders for the construction of a dock at San Estevan de Pravia, in Asturias. The cost is estimated at 70,000*l.* Plans, &c., may be seen at the Ministry in Madrid, and at the Department of Public Works in Orviedo. Tenders will be received up to November 30.

THE *Irish Times* says:—We understand that Mr. Buckley, T.C., has been elected chairman of the electric-lighting committee of the Corporation of Dublin, in room of the late J. L. Robinson. No better selection could have been made for a particularly responsible office. The difficulty of filling the place is all the greater in following one who was so active and specially qualified for the position as the chairman whose decease has been so much lamented.

THE Birmingham coroner, at an inquest about the death of a painter who was killed by a fall from a scaffold on which he stood while painting one of the markets, said more security was needed not only for the workmen, but also for the public who passed beneath the scaffold. Something in the nature of a strong tarpaulin net, in the place of the linen one used for the debris, would no doubt meet what was desired. The foreman of the jury added that, while they were of opinion no blame

attached to anybody, they strongly recommended the Association of Master Painters and Decorators to ask the trade to provide some such netting as would prevent similar accidents. Mr. Breakspear, the contractor, expressed his regret at the accident, and said that, as no provision was made in the estimate of the contract with the Corporation for such a netting as was suggested, perhaps the Corporation would contribute something towards its cost.

THE MANCHESTER SHIP CANAL.

AT the present time Warrington may, the *Liverpool Courier* says, be said to be impaled on the horns of a dilemma. This is so in regard to its relations with the Manchester Ship Canal Company. It is a dilemma which constitutes the one absorbing theme of speculation and discussion in municipal and trading circles. But beyond and above this, it is a dilemma of an exceedingly dangerous and unpleasant character so far as the public health of the borough is concerned.

In 1885 an Act was adopted by the Manchester Ship Canal Company and sanctioned by Parliament, and in this Act were certain sections for the protection of the Warrington Corporation, and of traders, manufacturers and others carrying on business at or near Warrington. One of these sections stipulates that the company should provide for a minimum flood of water down the river sufficient for the sanitary purposes of the borough and for the supply of the manufacturers. The precise stipulations are that of 100,000,000 cubic feet of water passing from the direction of Manchester over the weir at Warrington, the Canal Company should be allowed to divert a maximum quantity of 10,000,000 feet, and so on in ratio. Since the canal has been opened, however, the flow of water has scarcely been a tithe of the stipulated quantity. The result has been that for months past that portion of the river which flows through the town and beneath Warrington Bridge has assumed the character of nothing less than an immense cesspool—an almost stagnant body of sewage and other pestilent filth. Much of this is the deposit from the sewers of the town, which under ordinary circumstances would have been swept down to the sea, but the bulk of it is filth and sewage which has dribbled down the stream from Manchester. The tidal flow between Widnes and Warrington has also decreased to an alarming extent. Tides which aforesaid enabled barges and steamboats to navigate

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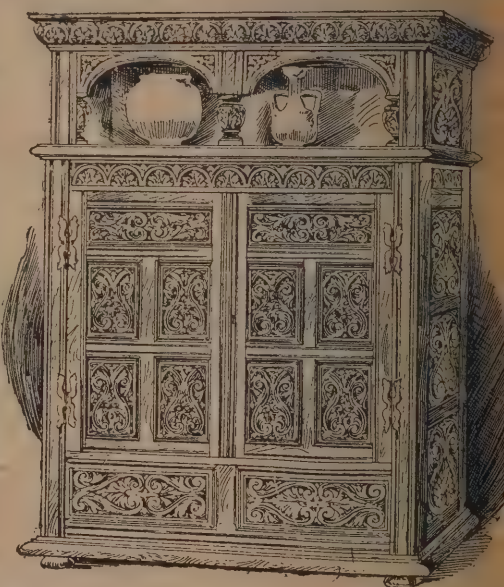
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to Warrington are no longer useful in this direction. They have lost all strength of "scour," the river bed is quickly silting up and the tides only serve to stir up the noxious deposit on the bed and the banks and accentuate a stench which permeates the air for a great distance about the river. This, in itself, is exceedingly serious. The areas contiguous to the river banks—on the Cheshire side especially—are densely populated. The poisonous effluvia which arises from the deposit has to be battled with in the hundreds of adjacent houses, disinfectants have almost hourly to be used, sickness is prevalent to an alarming degree, and the medical profession are unanimous in their condemnation of the nuisance. The other Sunday the dangerous and objectionable smell became so powerful that the worshippers in the parish church, which stands at a considerable distance from the river, experienced much discomfort.

Week after week have deputations from the Corporation met the Ship Canal people, and although at length the company have consented to carry out certain works up the river near Warburton and Butchersfield, for the purpose of creating a stronger flow of water, many experts believe that the nuisance even then will not be remedied. In the meantime the public health of Warrington is being not only endangered but detrimentally affected, and the value of the house property near the banks of the river is falling to an alarming extent.

The Mersey at Warrington has not, since its pollution was first commenced, been a "thing of beauty" and never gave promise of being "a joy for ever." But though the fall of sewage into the stream which has been going on for years encaked its bed with black, repulsive slough, the public were very seldom annoyed by a sight of it, and the hourly dangers created by the present condition of things were unknown, for the tides were always strong enough to carry the deposit to the sea before it became fetid. It is generally considered by experts that the works being carried out by the Ship Canal Company will not be effectual in abolishing the nuisance. And what steps should be taken if this be the case no one seems to know, and indeed nothing can be done unless Parliament steps in and peremptorily puts a stop to the pollution of the river at Manchester. A more obnoxious or unhealthy sight than the black, evil-smelling water and abutting deposit of filth could not be imagined. Nor, indeed, could a more efficacious means of germinating disease be devised than the present condition of the Mersey at Warrington.

But the borough's grievance does not end here. There is

another section of the Act in question of infinite importance to the commercial well-being of the town. According to this section the Canal Company are bound, in order to safeguard the rights of the riparian owners from the silting up of the stream, to make "and for ever maintain" a dredged channel from bank to bank, having a minimum depth of 8 feet at low tide, in a part of the river from Latchford Weir to the works of Monks, Hall & Co., some two miles down stream. The dredging of the channel has no doubt been attempted, but the stipulated depth cannot be maintained, and the result is that navigation has practically come to a standstill. Although the company have had dredgers at work since January 1, the labour and expense seem to have been in vain. Almost as quickly as the channel is deepened it silts up again. Experts have come to the conclusion that it is a physical impossibility to keep the channel in the bed of the river 8 feet deep without an enormous permanent expenditure involved in the dredging. It is a fact well agreed upon that the dredgers will always have to be at work to prevent the river even becoming almost totally unnavigable. The company, however, are, according to the Act, compelled to carry on the work, or for every day after July last when the channel is not maintained at its stipulated depth pay a forfeit of 50s. per day. In consideration of some work which the company carried out at the request of the Corporation—namely, the construction of a lock from the canal into the river—the period was extended from July 1 to October 1. Since that date, however, there have been dredgers at work day by day, and still the depth of the channel cannot be maintained.

The work has already cost many thousands of pounds. The accruing of the daily forfeit, if it be not quickly avoided, cannot fail to land the company into one of their most serious financial difficulties. They have recognised this, and are endeavouring to arrive at an agreement with the Corporation of the town to avoid the embarrassments of the situation. Deputations are constantly meeting, and negotiations are known to be on foot for the purpose of releasing the Manchester Ship Canal Company in some way from the statutory obligations above referred to. It is urged on their behalf that, either from want of funds or because of the physical condition of the river, it is impossible for them to comply with the Acts of Parliament. The feeling of the members of the Corporation on the point is extremely strong, but they recognise that it would be almost impossible to enforce the legal penalties, and hence they are

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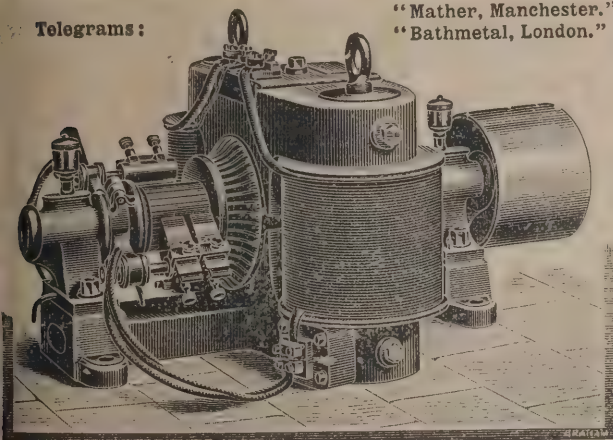
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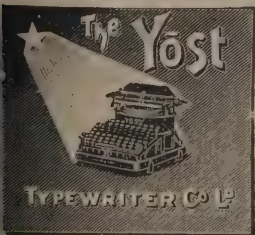
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anxious to arrive at some suitable compromise. What this is likely to be no one but themselves and the Canal Company's deputations know. The whole of their transactions are carried on privately, and the press are, in consequence of resolutions enforced by the company's deputations, kept severely in the dark. The traders, however, are beginning to tire of the whole business. There is a powerful feeling among them that some concerted action should be taken. The more practical of them, who use the river to a considerable extent, can only see one fair method of compromise. They see that the river cannot for ever be dredged by the company, the expense would be too great; therefore they demand that they should be allowed permanently a free waterway along the Ship Canal from Eastham to Warrington, and this demand in all probability will be conceded.

The construction of the docks appears now to be a dead letter. It was the hope of having these made that induced the Warrington public to enter into the movement for the construction of the canal with so much enthusiasm. When the Bill was passed by Parliament there were torchlight processions and a generally wild display of gladness. The traders and others thought that the "tide" which was to lead them to fortune was the one that would bring ships to their docks. The vision has been dispelled. They feel themselves, to use the vernacular, to have been "left." It is like to the imbibing of the essence of wormwood to many of them to recognise the unmistakable truth that the town has been sacrificed for the benefit of Manchester. Poor Warrington! To be belated in most things seems ever to have been her fate; but how much is the truth evident in this instance?

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THIS Society have recently visited the works of Messrs Maudslay, Sons & Field, Limited, of Lambeth, over which they were taken by Mr. G. M. Lemmi on behalf of the firm. The party were first shown the historical portion of the works, which is the birthplace of modern machine tools, the first self-acting lathe having been invented and constructed by Maudslay. Lathes constructed as long ago as 1800 are still at work, as also are three table engines constructed as long back as 1824. The members were then shown the engines in course of construction for H.M.S. *Renown*, together with a number of engines for torpedo-boat catcher vessels. A pneumatic

dynamite gun was then inspected. Various propellers in phosphor bronze, cast and wrought steel were shown. The visitors were then taken to the "Belleville boiler" and were shown the simplicity of its arrangement, the ease and facility with which it is worked, the readiness with which steam can be raised and the many other good qualities of this boiler. This type of boiler is not an experimental one, as it is now becoming largely used by both mercantile and naval vessels. The two warships *Terrible* and *Powerful* are to have boilers of this type; the French have adopted them, the Spaniards have adopted them, and they are in use in some of the largest mail steamships. Another type of water tube boiler, the "White," is also constructed at these works, it having proved very efficient; it is used principally for the smaller class of vessels, such as torpedo-boats. The party then visited the smithy and foundry, the latter being famed for the excellence of its productions. The model room, an important feature of this establishment was not passed over, for the superb models it contains of various types of marine engines are a pleasure to all who have the opportunity of seeing them. At the conclusion of the visit a hearty vote of thanks was given to the firm and Mr. Lemmi, to the first for the opportunity afforded for inspecting these works, and to the latter for his great attention and courtesy.

A NEW FIREPROOF SYSTEM.

A NUMBER of architects, engineers and others on Friday last inspected a system of fireproofing, the invention of Mr. T. L. Banks, at the works of the St. Pancras Iron Co. A brick building had been erected, its lower storey being filled with inflammable material, which was set fire to and allowed to burn for thirty-five minutes. The strength of the flames was very great. The fire was finally extinguished, and the party then examined its effects. The room had been ceilinged on the new system, and it was found that beyond slightly cracking the plaster no harm had been done. Nor had the heat penetrated the room above, where a block of ice remained unmelted. The fireproofing consists of helical metal lathing covered with plaster, and so fixed that a small chamber, through which passes a current of air, is left between the floor above and the ceiling below. It is impossible for the heat to reach the joist ends, so that no twisting of these from the heat of the flames results. We shall probably in a future number give an illustrated description of the invention.

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THE LONDON COUNTY COUNCIL AS CONTRACTORS.

At the meeting of the London County Council on Tuesday the works committee presented accounts showing the differences between the estimated and the actual cost of works entrusted to them. The total estimates amounted to 66,061*l.* 1*9s.* 2*d.*, while the actual cost was 63,045*l.* 18*s.* 5*d.* They claimed that in such works as excavation, brickwork, &c., the cost compared very favourably with that of contractors, but in architectural work, where the cost had exceeded the estimate, their work was of such a quality as is only comparable with that executed by builders of the highest class, who very seldom undertake work at competitive prices. They consider they have had to work under difficulties, such as unsuitable premises, second-hand machinery worked by old and wasteful engines, and so on, and these conditions will have to continue until nine or twelve months hence, when the new workshops, stables and offices will be completed.

Mr. Westacott moved that the report be received with the exception of the paragraph referring to the cost of the works of the Council. In the report before the Council there were thirteen items mentioned of which nine cost more than the estimate and four less. The only work they could manage to

do under the estimate was that done under ground, where it could not be seen. Nearly every matter referred to the committee cost more than the original estimate, and they were by no means saving the ratepayers' money.

Mr. Hoare said that the committee had not been in existence a sufficient length of time for the Council to ascertain the profit or loss arising from their operations. He suggested that the Council might later on obtain powers to compete with contractors for the work of local authorities.

Colonel Rotton urged the committee to make a clean breast of the matter and tell the Council if they had lost money and how they had lost it.

Lord Farrer agreed with Mr. Hoare that it was too early yet to say whether the works committee was a success or not. He hoped they would take into consideration the suggestion that they should offer to do work, especially sewer work, of which they had large experience, for vestries and other boards in London in competition with contractors.

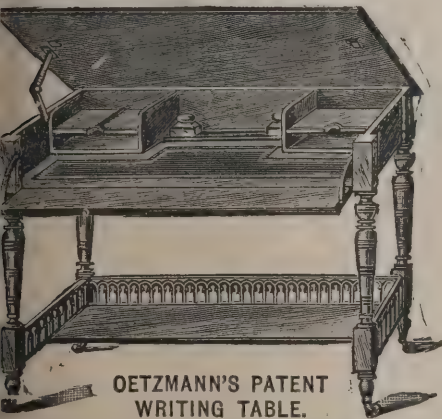
BOARD OF TRADE AND LIGHT RAILWAYS.

THE following letter has been addressed to the following public bodies:—Associated Chambers of Commerce, Central and Associated Chambers of Agriculture, London Chamber of Commerce, Railway Companies Association, Institute of Civil Engineers, London County Council, Association of Municipal Corporations, Association of County Councils:—

Board of Trade (Railway Department), 7 Whitehall Gardens, London, S.W.: October 29, 1894.

Sir,—I am directed by the Board of Trade to communicate with you on the subject of a movement recently set on foot with the object of obtaining further powers and facilities for the construction of light railways and steam or electric tramroads. It has been alleged in some quarters that the requirements which are imposed by the Board of Trade upon new railways in the interest of the safety of the travelling public and of the railway servants, as well as for the public convenience, may stand in the way of those who are desirous of promoting railways through agricultural or sparsely-populated districts.

It has also been urged that light railways may have great utility and importance as a means of assisting those who suffer from the depression in agriculture, by affording them



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easy and inexpensive means of bringing their produce to the best markets.

The same observation has been made as regards an even more difficult branch of the subject, namely, the possibility of relieving populous urban districts by giving special opportunities to workpeople to travel in and out of towns at a minimum cost, or by making it easier for manufactories to be established in suburban or country districts.

Interest in the movement has no doubt been stimulated by the action of those foreign countries in which light railways have been developed.

The Board of Trade are sensible of the importance of the question in these various aspects, and have taken great interest in the representations which have from time to time been made to the Department, but they have not yet had before them practical proposals which would enable them to decide how far a demand for economy in construction would justify relaxation of any of their usual requirements now enforced in the interest of safe working, and whether a change in the law by which necessary powers might be more easily or cheaply obtained would be likely to be followed by any considerable development of the modes of transport contemplated.

It may no doubt be contended that the powers conferred by the Railways Construction Facilities Act, 1864, as amended by the Railways (Powers and Construction) Acts, 1864, Amendment Act, 1870, and the Regulation of Railways Act, 1868 (Part V.), on the one hand, and the Tramways Act, 1870, on the other, are sufficient to satisfy the requirements of ordinary trading companies desirous of constructing and working light railways or tramroads. The Board of Trade are, however, so much impressed by the desirability of obtaining all the information which can be afforded by persons interested in the movement that they think it well to take prompt steps for the purpose of eliciting and focussing such views and information. And they conceive that both local authorities and traders, as well as the existing railway companies, will welcome an opportunity of joining in a discussion inaugurated with this object.

I am therefore directed by the Board of Trade to inquire whether the ——— would be disposed to depute ——— members of their body to attend such a conference at the Board of Trade on an early day with the object of discussing:—

1. How far the usual requirements of the Board of Trade as to constructing and working new railways may fairly be relaxed, especially in the case of lines built through sparsely populated and agricultural districts.

2. Whether additional legal facilities for obtaining powers to construct tramroads and light railways are necessary or desirable.—I am, Sir, your obedient servant,

COURTENAY BOYLE.

THE NEW CRAIG HOUSE ASYLUM, EDINBURGH.

THE opening ceremony of New Craig House, in connection with the Royal Edinburgh Asylum for the Insane, has taken place. The splendid building, which has been in progress for about five years, is, says the *Scotsman*, an admirable architectural adornment to the elevated site it occupies in the south-west side suburbs of the city; while internally its arrangements and fittings have been brought up to date, so as to make it in all respects a first-class house for the unfortunate class of patients for whom it is intended.

The plans are by Messrs. Sydney Mitchell & Wilson, who have been alike most successful in their conception and execution of this important building. The style is the later phase of the French Renaissance, which has enabled the architects to introduce what was desiderated by the medical superintendent of the asylum, Dr. Clouston, great variety and attractiveness into its composition. Viewed from the north, the central feature is a massive square tower 100 feet in height, about which the other parts of the design group themselves in a picturesque and effective manner. Variety of line and feature is secured by the introduction of towers with bell-shaped roofs at the angles of the buildings, and on the face of the north and south projections and wings; by a line of circular-headed dormer windows on the third floor, by ornamental gables, carved and broken pediments, open balustrades, bold chimney stalks and high-pitched roofs, and by blending in its construction red and white stone. On the building there is little or no detailed ornamentation. The aim of the architects has been to produce a composition which at a distance will have an imposing effect, and close at hand agreeable general lines and features. In this they have admirably succeeded. Seen from Myreside, the asylum rising on the crest of the hill over a screen of trees—at this time of the year robed in autumn colours—presents a most picturesque aspect.

The asylum building extends east and west for a distance of 360 feet and from north to south, measuring the central block, 250 feet. The ground plan shows a building shaped like a capital "E," with the middle stroke carried further backwards than forwards, thus, "—E." The open face is towards

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Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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the south, while the back stroke runs out towards the north. In this centre block are the great hall and all the important public rooms. The chief entrance is placed in the north-east angle and is approached by a spacious gravelled court. The entrance porch opens upon a large oak-lined vestibule, on the east side of which are waiting-rooms for visitors and a doorway leading to rooms above set apart for the use of the medical superintendent and his assistants. Passing inwards and ascending a broad flight of marble stairs, the visitor arrives in the great hall, which will form a rallying point in the common life of the institution. It is large and lofty—63 feet long, 33 feet 6 inches wide and 45 feet high to the crown of its vaulted ceiling—and most attractively, even richly, decorated. It is panelled in oak to a height of 12 feet. Higher the walls are divided by ornamental pilasters into six vaulted bays. Above these is a deep frieze with flower garlands and cherubs in high relief, while below the under line of the frieze are scrolls on which are emblazoned the names of the cardinal virtues. The ceiling is coved and panelled and richly decorated in gold and other colours. The colour scheme is based on the three primary colours, blue, red and yellow, and the solid gilding everywhere visible gives the hall a bright and handsome appearance. The lighting is by means of a small clerestory and a large finely-proportioned Venetian three-light window facing north, 30 feet high and 25 feet in breadth. At the south end is open screen-work in oak, communicating with what is in reality a corridor leading to the officers' quarters, but which from the hall looks like a musicians' balcony. On each side of the hall is a handsome brown stone chimney-piece with hood. The upper spaces are panelled in alabaster and carry medallions of Dr. Andrew Duncan, the original founder of the institution, and of Dr. Clouston, the present medical superintendent. Below are panels in which are sculptured the arms of these gentlemen, as also the armorial bearings of the city of Edinburgh, the University and the Royal Colleges of Surgeons and Physicians. Artificially the hall as well as all the rest of the building is lighted with electric light. The electroliers suspended from the ceiling are of wrought-iron, artistically designed and gilded, and there are also side brackets. This central hall will play an important part in the social life of the institution, as it will be used for morning prayers, for church on wet Sundays, for dances, theatricals, concerts and other entertainments. Opening off this hall on the south side are two large rooms—a drawing-room facing east and south and a billiard-room. The former is 40 feet long by 22 feet wide and 15 feet high, with a

rectangular bay 4 feet 6 inches deep. The latter room is 30 by 22 feet, with a large recessed fireplace or ingle-nook 17 feet wide and 5 deep, raised one step from the floor. The drawing-room has been charmingly decorated. The walls are panelled and hung with old rose French silk tapestry. There is a pretty stencilled frieze. The paint for the most part is cream and gold, and the ceiling is panelled in soft French blue. There are two fireplaces with overmantel mirrors, as also a nice cosy nook with fireplace in a corner circular turret. The room has altogether an air of elegance and refinement which would not be out of place in a nobleman's mansion. The fact is that nothing could better illustrate the modern method of treating the insane, as compared with the Mediæval dark hole and chain system, than the manner in which the new asylum has been planned and decorated. If a visitor were set down in the midst of it without having been told what the object of the building was, he would very probably hazard the opinion that he was in a splendid country mansion. It is one of Dr. Clouston's leading principles that in the treatment of the insane their surroundings should be made as bright and pleasant as possible. Everything, he has said, which produces cheerfulness of effect inside and outside of the asylum should be studied, and to that end variety has been given to the shape, size and aspect of every room in the building, if not structurally at least decoratively, so as, if possible, to interest, rouse and cheer the patients in their passage from one to the other. The dining-rooms, five in number, and situated on the north side of the great hall, vary in size from 28 feet by 20 feet to 32 feet by 35 feet, and are distinctively and beautifully decorated in full tones, and not two of the bedrooms are papered and painted alike. The corridors partake of the same variety of treatment, yet all are in excellent taste. Below the dining-halls is a spacious suite of kitchens, sculleries and other offices, all lined with white tiles. Communication with the floor above will be maintained by means of lifts and service stairs, while connected with each dining-room on its own level is a service-room fitted up with hot plates, &c., so that food may be served in good condition. Further down the northern slope of the hill is a building for the engines and dynamos, of which there are four, there being an installation of 1,200 lamps, and at a lower level is a battery of great boilers, six in number, for supplying steam to the engines and to the ranges in which the cooking is done, and hot water for the pipes by which the asylum is heated. At present only the eastern half of the building, along with the central block, is to



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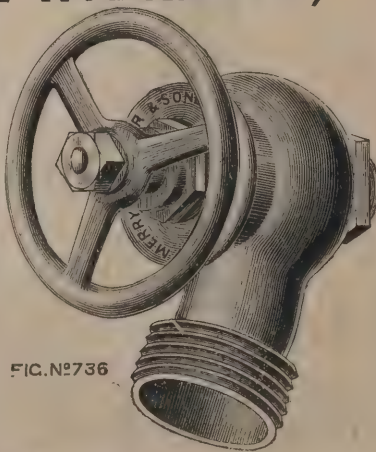
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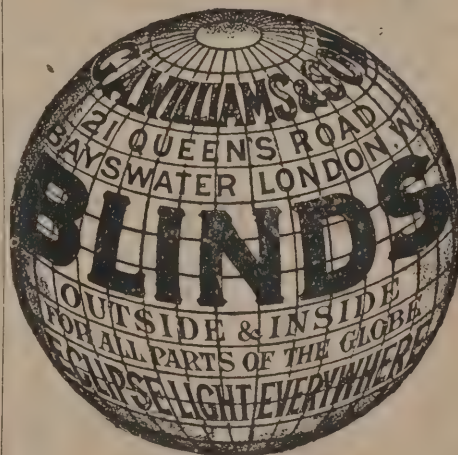
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 GOLD MEDAL, Inventions Exhibition, 1885.

be opened, and that only in the meantime need be described. The western section, however, corresponds to the eastern in all respects. The whole building was designed to accommodate 150 patients, though it is believed there will be room for more than that number. The eastern half, therefore, represents an asylum of seventy-five beds. The Asylum buildings are three storeys in height. That portion nearest the central block runs east and west, while the end wings stand north and south. These, while opening into one another, are at the same time so arranged, structurally and otherwise, that they form what are practically four distinct wards in which classification of the patients may be made according to their mental condition. In each of the two principal floors of the portion of the building running east and west is a spacious gallery or corridor, 80 feet long by 14 feet in width, having a range of windows, on the south side, and on the other a row of bedrooms. Each ward has two parlours, commanding splendid views; about the centre of the corridor on the north side there is a projection, in which the lavatory accommodation is placed; and in a corresponding projection southwards are special rooms for noisy patients. Each ward has also attached to it a small kitchen, in which light food can be cooked. The wards running north and south are arranged on a somewhat different principle. The corridors there, each 45 feet in length by 9 feet wide, are placed in the centre of the block, and opening off them are seven bedrooms on each side, while the whole of the south front is taken up by two large parlours on each floor, 24 by 16 feet and 30 by 19 feet. In another corner of the ward is a private parlour with the windows in a projecting tower. The upper floors are entirely devoted to bedrooms, opening off corridors, as in an ordinary hotel. In the central tower are also a number of bedrooms. The upper section, however, is arranged as an arcaded belvedere, with the windows filled in with glass. The stairs throughout the building are of concrete, and though there are a good many of them, on account of the difference of the levels, they are all planned on easy gradients. The principal corridors have a dado of pale blue tiles. Though there are many rooms with open fireplaces, the heating of the Asylum is done by hot water on the low-pressure system, and the coils, specially made, are horizontal instead of vertical, which has certain advantages, and efficient ventilating arrangements are also introduced. The whole building, it may be further explained, is divided into small sections, so that any accident occurring to the electric-light wires, heating pipes, or water-supply pipes to baths and basins is confined to that particular

section alone. The main building is divided into ten separate sections by stone walls carried through the roofs in order to prevent the spread of fire. This has been accomplished without loss of architectural effect by raising portions of the buildings above the general height in low towers with flat roofs. In order to give means of ready escape in case of fire, every room can be reached by at least two staircases.

The scheme also included the erection of four villas and two hospitals, one on the east and the other on the west side of the main building. Both hospitals have been erected, as also three of the detached villas—South Craig, Queen's Craig and Bevan House.

The tenders accepted for the execution of this important building amounted to 65,494*l.* 6*s.* 5*d.*, exclusive of the cost of water supply, lighting, heating, drainage, painting, furnishing and other accessories which, it is believed, will run up the ultimate cost to 110,000*l.*, whereof upwards of 100,000*l.* have already been disbursed. Of this large expenditure there has been defrayed out of the receipts for patients' accommodation in the East House upwards of 33,000*l.*; the sum of 2,791*l.* has been met by the price of land sold to the railway company, and the balance has been raised in loan upon the security of the East House and Craig House. It is noteworthy that the extensive building operations connected with the new Asylum have been carried out without a serious accident or mishap to any of the numerous body of workmen employed. The contractor for the whole masonry and carpenter work of the new Asylum was Mr. John Lownie. The clerk of works was Mr. Perry, and Mr. Bryson was consulting electrical engineer.

BETTERMENT IN NEW YORK.

(Concluded from last week.)

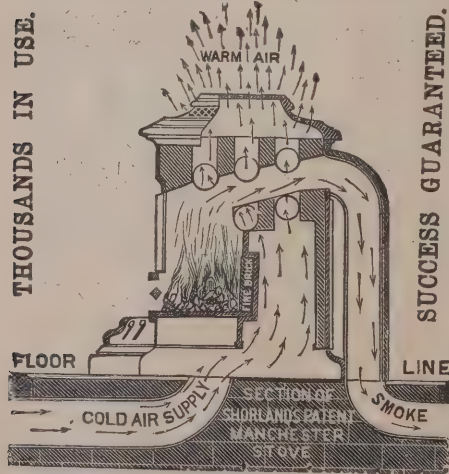
THE committee of the House of Lords on Towns Improvements (Betterment) were enabled to obtain the evidence of a distinguished expert, General Egbert Viele, respecting the procedure adopted in New York in settling public improvements. The following are the principal portions:—

Chairman.

What the committee would like to know is this: Take the case of a clear improvement which has widened a street and made the houses more valuable for the purpose of letting or

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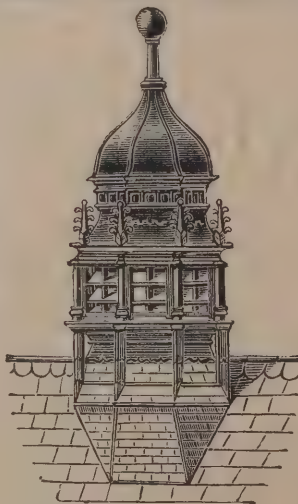


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WORKS, ROTHERHAM. Estab. 1854.

any purpose you please, and that more rent can be obtained for them; the effect of that might be to render a smaller street in the immediate neighbourhood less of a thoroughfare, and therefore might make the houses in it of less value. Has that hypothesis ever been dealt with?—That hypothesis was not considered, in fact, on the line of improvement in the case of Worth Street. Streets on either side of it were also widened; Reed Street and Warren Street were all widened simultaneously within the same period, to prepare for the rapid approach of an increasing trade which took possession of it the moment it was opened.

Marquess of Salisbury.

Are the houses occupied by their owners or occupied by leaseholders?—The dwellings that were torn down had at one time been residences of a very respectable class of the community, but trade was driving them away, and they were occupied as tenement houses by an inferior class of population; in fact, a vicious class of population took possession of the old houses as fast as they became deserted by the other tenants before they became converted into business premises.

Then these occupiers who were turned out received no compensation for their eviction, did they?—None whatever.

Was the only person compensated the ground-owner?—It was merely a question of the value of the building destroyed and the value of the land taken.

And in the damage which this assessment for benefit was to recoup did you include the cost of making the road, or only the amount of compensation for the land and houses taken?—No; the cost of making the roadway is always assessed directly upon abutting owners everywhere. The roadway, pavement and the sewers are always assessed upon abutting owners; it never goes beyond them.

Then the levy for benefit was entirely expended in paying compensation for the land and the buildings upon it, was it?—Entirely so.

Lord Thring.

As I understand you, in the particular case you are quoting, no municipal money was advanced at all, was it?—None whatever.

The municipality advanced nothing, did they?—Nothing whatever; the property owners paid it all.

The transaction, in fact, was this, was it not. The city under a statute took a particular area of buildings, then they

sent commissioners to assess the benefit and damage, as you call it; and then they paid the persons entitled to the money out of the proceeds of the improvements?—Out of the proceeds of the assessments.

But they did not advance one sixpence themselves, did they?—Not one sixpence.

That is analogous to our way of doing it. In our case the municipality advance the whole of the money out of the municipal funds, and the question is whether or not they ought to repay themselves a certain portion of the sum so advanced out of the benefit which is proved to have ensued to certain owners by the improvement. Do you think that unjust?—There is a system of issuing improvement bonds by the city who pay in these instances, but recoup themselves from the assessment when it comes in. When an assessment is levied upon property the city issues improvement bonds in many instances, so as to pay the parties, and they afterwards receive this money back into the Treasury from these assessments which are levied. The city aids, in that way, by what may be called lending its own credit in issuing these bonds and redeeming them afterwards.

In the case you have given us the injustice was obvious, was it not; because they assumed that a particular area would, if improved, pay the whole of the expense?—Yes.

But supposing it had been put the other way; supposing the municipality had not assumed anything whatever, but had paid the whole of the expense of the improvement, and then finding that certain owners of the houses in certain areas had received very great benefit, would it have been unjust that they should have asked those owners to repay to them a portion of the great benefit they had received through the public money?—It would not have been unjust.

Lord Farrer.

Who fixes the area, the commissioners or the Legislature?—The commissioners.

Do the commissioners say that within a certain area land shall be taxed sufficiently to get that money back?—Yes.

The commissioners decide that, do they?—Yes.

Do they decide on the area?—Yes.

And have the commissioners not to determine at all whether it will be improved or not?—Not at all in detail.

Then is the problem before them this. Here is an improvement which is to cost half a million of money; that half a million of money has to be raised. Then they have to decide

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Mr. J. H. Gething

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upon a certain area, and say everybody within that area shall be taxed sufficiently to raise half a million of money?—Yes.

Is that the principle?—That is the precise principle.

Without any reference to the actual increased value?—Without any discussion of the details of the increased value of those pieces of property.

But do they form any opinion, or do they not form any opinion, as to whether that property has been improved?—None whatever; they cannot do it.

Then you told us that in this particular case the property had been so much improved in value by the building of marble palaces and otherwise, and the rates increased so much that the property was paid for over again?—The property on the line of the street improved so much in value that in the course of years the increase of rates amounted to about the same as the assessment of the damages.

Your general rates are high in New York, are they not?—Within 2 per cent. of the assessed value, which amounts to about one-half of the actual value.

Of the actual capital value. Your rates are based upon capital, are they not, not upon income?—They are simply on the value of the real estate itself; on the capital value, not on the rental.

Then you told us that the rates increased so much in consequence of the increase in value of the land arising from this improvement, that the increase in the rates in course of time would recoup the municipality for their expenses?—Yes, in the instance I refer to, of Worth Street.

Then in that case the value of the property itself must have increased, must it not, in a very much larger proportion?—Yes.

As the increase in the rates bears a very small proportion to the aggregate value of the property, that property must have benefited very largely by the improvement?—Yes.

Then where is the injustice if the city takes to itself some of the benefits which it has conferred on these people by the improvement?—The injustice I referred to was with regard to property a large area of which is assessed without any return whatever.

Do you mean the arbitrary nature of the area?—Yes.

But supposing the commissioners had selected that part of the property that was ultimately improved in value, where would be the injustice?—There would be the chance that the value might increase, and that it might not. In the case of Worth Street it did. There is a portion of Duane Street which is in the same condition to-day as it was forty years ago when it was widened, because the people had not the money to improve it.

Then the injustice consists, not in taking the money from the owners of the property which is benefited, but in taking it from the number of persons who are not benefited, does it?—Yes; quite so.

Marquess of Salisbury.

I want to ask you a question with reference to the leaseholders. I think you told me that nothing was paid to them for disturbance when the land was taken from them, but only to the ground owner?—I beg your pardon; in the case where people showed that they were deprived of their leases that was considered in awarding the damages.

And the amount was settled by the commissioners, I suppose?—Yes.

Lord Egerton.

I think you said that since the injustice in the carrying out of the Worth Street improvement had been felt so largely, other systems had been adopted of spreading the costs of certain improvements over the whole city?—Yes.

Is that now the normal state of things in New York, or do you still revert to what you have described as an injustice?—There is not a normal condition of things. Property owners who want to get improvements made frequently go to the Legislature, and use a certain influence and get large powers, which are all exercised at the expense of the city. There is no defined action; it depends on the skill or influence of the individual.

Do individual owners in New York never carry out improvements on their own account, either solely or partly, with the assistance of the municipality?—Not at all; not so far as streets are concerned.

There is no one, is there, like the Duke of Westminster, who would carry out an improvement on his own property on his own account?—There have been instances where the owners of property have arranged with the authorities to do the work of improvement at their own expense.

You spoke of improvement bonds. I should like to know in what cases they are issued; are they issued in the case of every improvement or only in the case of a certain improvement of a very large character?—They are issued to obtain the temporary use of money until it comes into the Treasury from the taxes.

Does not that seem to be the simplest and readiest way of

carrying out an improvement, to borrow the money on favourable terms and to repay it after a certain time by capital and interest, the rates paying the capital and interest as well?—The issue of those bonds is merely for obtaining the money to pay these owners until the tax comes in.

Do you mean the tax which will recoup the capital sum?—Yes.

You do not repay the interest over a series of years, then, do you?—The improvement bonds carry interest with them.

For how many years do they run?—Sometimes they run five years and sometimes ten years, but ordinarily the short improvement bonds run five years.

In that time does the municipality expect to recoup itself by the increased value or the increased taxation?—Yes, they loan the money; the city advances the money in order to see that there is no injustice done to whoever has property taken away from them, because it takes some time to collect this tax.

Lord Farrer.

These improvement bonds are sold in the market, are they not?—Yes; they are advertised, sold in the market and taken by the bankers.

And even sold in the City of London, I think?—I should think so; I should not be surprised; they generally bring a premium.

And they are charges on specific property, are they not?—No; they are charged on the property belonging to the city.

Is that so in New York?—Yes.

I have seen bonds from Chicago which have been charges on particular properties.—The credit of the city of New York is pledged in those bonds.

Marquess of Salisbury.

What interest do they bear generally?—Sometimes 3 per cent.; it varies; but bonds are readily taken at 3 per cent., and are very much sought after.

Chairman.

Is there any limit as to the power to make these improvements? Do you require an Act of the Legislature in each case, or is there any general system under which a particular body is entrusted with the power to make improvements?—The widening of these streets that I refer to originated with the council of the city; but the improvements at large, such as parks and boulevards, are done by a special Act of the Legislature.

Confining yourself for the moment to the question of the streets, is there any limit to the powers of the municipality to open a new street?—No; but they are generally governed by the express desire, through petition, of the owners of property along the line of the street.

I asked the question because I see the statute, which appears to date from 1807, appears to require as a condition that two-thirds of the owners along the intended street should concur in the desire that it should be done?—Yes.

Is that the law?—Yes; they must sign this petition, and it goes to the Council.

They must sign it, must they?—Yes.

Then the Council would have no power themselves to initiate it, would they?—No, they have not; they never initiate it.

Earl of Onslow.

You have had a very wide and long professional experience of the value of properties in New York, I understand. Supposing the commissioners were to ask you, as an appraiser, to give them an idea of the future value, the value for all time, of property which had been benefited by an improvement, do you think that you could state it?—I think not.

Do you think that would be impossible?—I would not dare to do it.

Lord Thring.

Supposing I wanted to buy a house in New York tomorrow, would you object to appraise the value of it?—Not at all; I would be very happy to do so.

Without calculating for all time?—I would give an opinion for its immediate future without any hesitation.

But you would not go into the eternity question, would you?—No.

Chairman.

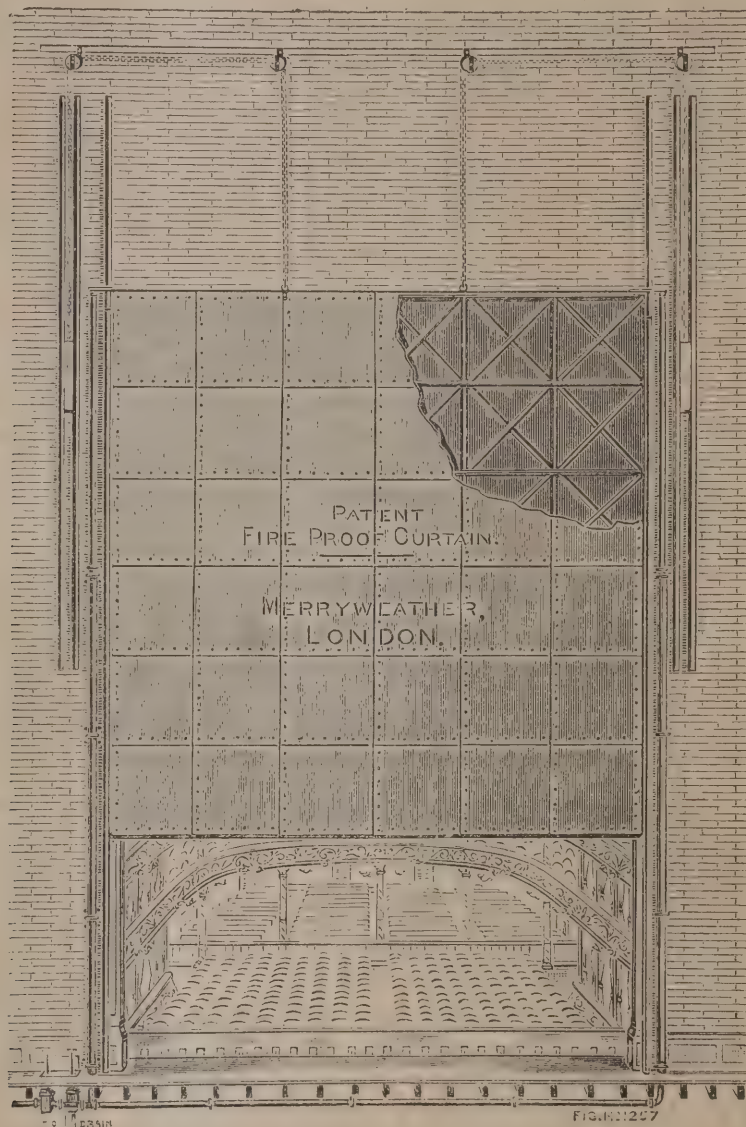
I should like to ask upon that, would the value you would give have reference to its existing value for sale at this moment or to future speculation?—I have been frequently asked to appraise the value of property, and have appraised it to the extent of many millions in the city of New York. I do not, as a general rule, base my opinion upon what it would sell for at that time, but I base it upon my experience of what has been the general character of the improvements. The real estate agents as a rule quote sales in improved neighbourhoods, but I have pursued a different course myself, and I think I may safely say that I have very seldom made any mistakes.

FIREPROOF CURTAINS.

MESSRS. MERRYWEATHER & SONS, of London, have recently carried out contracts for fitting several places of amusement with fireproof curtains. At the new Theatre Métropole, Denmark Hill, and also at the new London Music Hall, Shoreditch, this firm has constructed curtains, consisting of strong wrought-iron frames covered with asbestos cloth on both sides, and arranged to be lifted by a crab and winch. The curtain is almost balanced by counterweights, and can be lowered very rapidly in case of fire. Connection is made to the water-service, and special spray jets are fixed over the proscenium opening, and an automatic attachment, which is put in gear during performances, opens a valve and allows water to play upon the curtain as soon as it descends, thus keeping it wet and materially improving its fire-resisting qualities. Messrs. Merryweather have also introduced an iron curtain of similar construction, fitted with winch or with hydraulic cylinder

MANCHESTER MUSEUM LECTURES.

THE concluding lecture of the first popular course by Professor Boyd-Dawkins, upon "Prehistoric Civilisation in Western Europe," was given in the Chemical Theatre of Owens College. Taking for illustration "The Contact with History," the lecturer explained how, during the age of bronze, the hunter and the herdsman was succeeded by a race of people who, with better weapons and instruments, acquired in Gaul and the British Isles a fuller mastery of the arts of peace and war. The dagger was lengthened out to form a sword, the spear was introduced, the axe (with handle firmly fixed in the head, as contrasted with the neolithic axe in which the head was invariably inserted into the handle), and arrow tips, still of flint, became more efficient for their purpose. The habitation, traces of which are found in Anglesey and other parts of Wales, now began to have some resemblance to the modern house, being circular in plan, with a conical roof formed of turf or straw.



and pistons for lifting and lowering with water taken from the street mains. A third arrangement specially provides for buildings not having the space above the stage to allow of a rigid curtain, and consists of special woven asbestos on iron rollers and provided with suitable lifting-gear. One of these was fitted by the firm some months ago at Doncaster Theatre, and has been found very satisfactory. The accompanying engraving requires no explanation, showing as it does so well the general arrangement of 'Merryweathers' Improved Hydraulic Fireproof Curtain.

A LARGE clock has just been placed in the parish church of Whittle-le-Woods, near Chorley. It is fitted with all the latest improvements; there are three 6-foot dials and the hours are struck on a 10-cwt. bell. The work has been carried out generally to the designs of Lord Grimthorpe by John Smith & Sons, Midland Clock Works, Derby.

and with a hole at the summit for discharging smoke. The art of the bronze-using people was also described as evidenced by the form and ornamentation of cinerary urns, drinking cups, bowls and personal ornaments. Greater attention was paid to dress and appearance; pins were used, often bent to give more secure hold, and also the safety pin, the forerunner of the brooch. The mode of sepulture, the religious belief as indicated by the remains of their temples at Ebury and Stonehenge, were also detailed. Later, the use of gold and enamel came into vogue, and the employment of amber in jewellery. In the next age the use of iron became known, and the knowledge of the capabilities of the master metal of civilisation led to a general outgrowth in human affairs. Immediately prior to the historic period coinage was introduced, betokening an advance in commercial transactions. During these changes the individual gradually became merged in the family, and distinct tribes were ultimately formed, foreshadowing the organised effort which, in the Saxon Heptarchy, assumed a more complete development.

GLASGOW MASTER WRIGHTS' ASSOCIATION.

At the quarterly meeting of this Association, Mr. A. M'Farlane, president, in the chair, a paper was read by Mr. John Gordon, ex-president of the Glasgow Institute of Architects, the subject being "Observations on some Structural Details of Buildings." The speaker advocated a more extensive use of concrete in ordinary house building. It should be used in the case of all foundations. He thought the time was ripe for considering whether some modification of the fireproof concrete floor could not be applied to ordinary dwelling-houses. As regards the cost, he had made some calculations and had found that by paying 10s. extra rent the tenant of a three-room-and-kitchen house might have the advantage of a concrete floor which would be practically fireproof, sound-proof, smell-proof and vermin-proof. He believed that for these advantages many tenants would very gladly pay the extra rent. He was opposed to the use of wooden safe lintels in brick or stone walls now that iron and steel are so cheap and accessible. He would have all safe lintels of metal. He disapproved of lath and standard partitions except in the case of shops and warehouses, where they might very well serve as temporary arrangements, but in dwelling-houses he would insist upon all partitions being built of brick. A standard partition, however well it might be deafened, was less impervious to sound than brick. It was also the cause of much cracking of the plaster through shrinkage of the timber. He thought that a main defect of the lobbies in tenement houses was their want of light. He would insist upon the upper flat houses, where they could not otherwise be lighted, being lighted from the roof, and the lobbies below from borrowed lights in the walls above the levels of the door lintels. He enlarged upon the necessity of all plumbers' pipes and fittings being left naked, open and above board. The present practice created inaccessible corners for the accumulation of dirt and other nuisances. It prevented defects from being discovered until sometimes much mischief was done, and when discovered it often involved trouble and expense to repair the damage. It was a false sentiment that pipes and fittings were so essentially ugly that they could be made to look well. He thought the edict of the Dean of Guild as to opening windows a wise and salutary one. The main difficulty in carrying it out was the devising of a sash combining the three requisites, strength, simplicity and cheapness. The problem was being attacked on all sides and by all sorts and conditions of men, and probably we should ere long have a

solution that will commend itself to general acceptance. He referred to the term "jerry buildings," sometimes applied to erections in Glasgow. He thought it a misnomer. Whatever there might be in the south, where terraces were run up in a few weeks, there were certainly no "jerry buildings" in Glasgow, where six or eight months is the shortest time for the erection of a common tenement. The building regulations which had obtained here for the last thirty years or more had effectually prevented the erection of "jerry buildings." A discussion followed, and, on the motion of the Chairman, Mr. Gordon was cordially thanked for his paper.

CABLEWAYS.

A LECTURE was given in the Town Hall, Brighton, on Monday, by Mr. Brewer, the engineer of the new Dyke Cableway, on the "Development of Cableways." He said he did not claim that it was an entire novelty, but he had improved what had been tested elsewhere. Mr. Brewer explained how the cars could not be worked on the old system when a wind was blowing, whereas a gale made no difference in the working of his system, which could do any distance and took the easy grade of an ordinary railway, the movement being perfectly smooth. Mr. Brewer mentioned that since the opening day 3,000 persons had crossed in the Dyke car, and of that number only one female and two men had objected to it; indeed, his greatest friends were the ladies, many of whom had spoken of the pleasantness of the journey. Nevertheless, this was merely a prelude to what he was going to do in perfecting the system, when it would be not travelling but flying, and he hoped to take people from Brighton to Paris in three hours. It was in contemplation, he said, to make a cableway in Brighton, so that people might be conveyed from the Brighton Station to Sussex Square in $7\frac{1}{2}$ minutes at a cost of 3d.; and he showed by plans, &c., how this was to be done. The passengers would, in one part of the journey, be 300 feet above the ground, but as there would be frosted glass in the car, they need not look out unless they liked. Although the car would go up the steepest hill, there would be no shaking, not so much, in fact, as on an ordinary railway, and if the passengers were to shut their eyes they would never know whether they were going up or down. After what he had done at the Dyke he did not think anyone would doubt his ability to carry out this undertaking. Votes of thanks were given to Mr. Brewer for his lecture and to the Mayor for presiding.

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THE NEW NORTH BRIDGE, EDINBURGH.

THE Lord Provost's committee of Edinburgh Town Council have obtained explanation from the engineers in reference to the tenders sent in for the construction of the new North Bridge. With this information before them, they resolved to recommend the Council to accept the offer of Sir William Arrol & Co., the amount of which is 81,894/-. It is understood that the sub-contract for the masonwork is to be given to Messrs. William Beattie & Sons, builders, Edinburgh. The design which will be followed shows a handsome bridge of three spans, each span being 175 feet. The new bridge at its north end will spring from the south wall of the Post Office building, and the southernmost span will be carried over Jeffrey Street, which, it will be remembered, was crossed, according to the former design laid before the Town Council, by a small arch. The new bridge will have a uniform width of 75 feet between the parapets, which is practically the same width as the present North Bridge Street at its most northerly part. Except the piers, which will be of masonry, the structure will be entirely of steel, with ornamental cast-iron face-work. The plans approved of provide for a uniform gradient from the Post Office to the High Street, which reduces the present gradient of 1 in 18 to 1 in 27. The scheme necessitates the taking down of the blocks directly at the south end of the present bridge, on the east and on the west side of the street, and another important improvement effected is the additional width of the new bridge as compared with the existing structure—75 feet as compared with 54 feet between the parapets.

THE AUCTIONEERS' INSTITUTE.

THE session 1894-95 of the Auctioneers' Institute of the United Kingdom (Incorporated) was opened on Tuesday at 63 Chancery Lane, when Dr. Heber L. Hart delivered an inaugural address on the subject of "Legal Restraints on Auction-room Ingenuity." Mr. F. Everill (Worcester) presided, and was supported by Mr. James Catling (Cambridge), vice-president; Mr. George Brinsley and Mr. E. W. Richardson, members of the council; Mr. Allen Drew, Mr. R. Peck, Mr. H. P. Norris and a large number of fellows and associates of the Institute in London and the provinces. Dr. Hart said that as soon as the auctioneer left his facts and gave scope to his imagination he must be careful, as a matter of legal obligation, to confine himself to generalities, and must scrupulously

eschew particularity of statement. Without special authorisation he must not allow himself to be entrapped into giving a warranty, otherwise he might become personally responsible to the purchaser. Any deliberately pursued design to disparage the property which was put up for sale on the part of one who subsequently became the highest bidder would entitle the vendor to set aside the sale. It seemed, therefore, clear that the auctioneer need not accept the bid of anyone who had intentionally disparaged the property, and also that an action would lie for any special damage sustained by the vendor in consequence of such depreciation. Bids which must be refused were those made by the vendor or his agent, unless the right to bid was expressly reserved. Puffing was now illegal in all cases. Where the sale was simply announced to be subject to a reserve price no bidding on behalf of the vendor was permissible. In the case of a sale by trustees, a bid by any of them must be refused. The auctioneer must not make a pretence of receiving bids which were not, in fact, made. If he did he might find himself made a defendant to an action by the purchaser, in which he would be liable to repay the deposit with interest and the costs of the action. A bid by the auctioneer on his own behalf could not be maintained as against the vendor if he declined to complete, and as against the next highest bidder in the case of a sale without reserve. A discussion followed.

BUILDING LAND IN SCOTLAND.

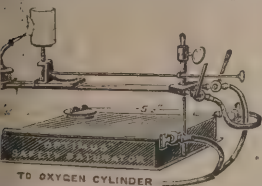
THE parliamentary committee on "Feus and Building Leases" in their report offer the following remarks on building sites:—

Although the ordinary tenure upon which land is acquired for building purposes in Scotland is feu, building leases, usually for a term of ninety-nine years, are not uncommon in certain localities, and it has been the custom in some rural villages and fishing communities, especially on the north-east coast, to build dwelling-houses upon land held without any written title, which would, in legal estimation, be held to import a right of lease from year to year only.

According to the law of Scotland, where buildings are erected upon ground held on lease, these buildings, in the absence of express stipulation to the contrary, become part of the soil, and belong to the proprietor upon the expiry of the lease. In the case of long leases this is felt to be a hardship. If the lessee makes no new arrangement with the lessor and quits his holding at the expiry of the lease, he has to leave the

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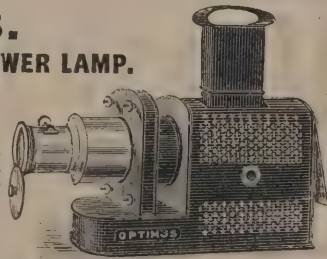
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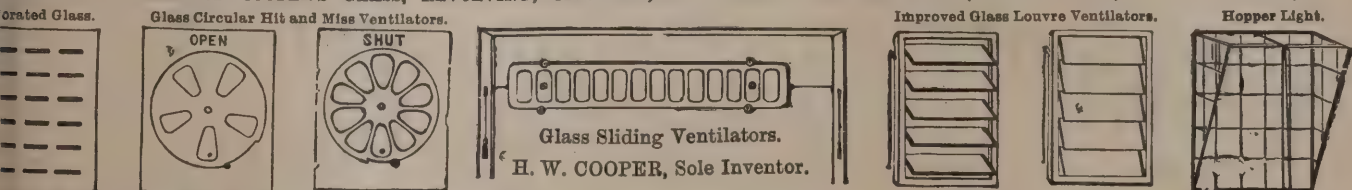


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buildings to the lessor without receiving any compensation for them. If, on the other hand, he arranges for a renewal of the lease, the existence of the buildings is taken into account, and he has either to make a capital payment or to submit to an increase of rent in respect of them under the new lease. If, again, he arranges for a conversion of his tenure into feu, he has practically to purchase at a capital price the buildings which he has himself erected, or to pay for them by a feu duty fixed at a higher rate than would have been exacted if the buildings had not in legal estimation belonged to the lessor. It appears from the evidence that in various localities in Scotland there is a considerable feeling that some legal remedy should be provided for this state of things, and that the lessee should be entitled to have his tenure converted into a permanent one upon fair terms.

The other case, viz. that of buildings being erected upon ground held upon tenancy at will, and without any written title, is less common, though some rural villages and the fishing communities on the north-east coast of Scotland afford illustrations of it. No evidence was submitted to the committee that in either case the rights of the lessors have been unduly pressed, and although the lessees appear generally to have enjoyed practically, though not as a matter of legal right, reasonable permanency of tenure, the evils resulting from insecurity of tenure are more or less felt.

As it is well known that the erection of buildings, often of very considerable value, upon ground to which the persons erecting the buildings have no permanent, and sometimes no written, title, is common upon the north-east coast of Scotland, the committee expected to have had more evidence upon the subject. The evidence submitted to them in regard to it was very slight, and consequently it was not thought necessary by those who may be supposed to represent the lessors' interest to adduce counter evidence. The committee, therefore, would not feel warranted in proceeding much, or at all, upon the evidence which they have heard on this point, but would prefer to deal with the question upon considerations of general policy.

As has been already stated, the ordinary tenure of building land in Scotland is feu, whereby a permanent right is acquired, and consequently the question of what is generally known as the enfranchisement of leaseholds is not so important in Scotland as it is in England, where the prevalent tenure of building land is leasehold. But the same considerations of public policy enter into the question as it arises in both countries, and in dealing with the Scotch case it is important to keep in view what

has occurred with reference to the analogous case in England. The Royal Commission on the Housing of the Working Classes, in their Supplementary Report, recommended "that legislation favourable to the acquisition on equitable terms of the freehold interest on the part of the leaseholder would conduce greatly to the improvement of the dwellings of the people of this country," because "the prevailing system of building leases is conducive to bad building, to deterioration of property towards the close of the lease, and to a want of interest on the part of the occupier in the house he inhabits," and because "the system of building on leasehold land is the great cause of the many evils connected with overcrowding, unsanitary buildings and excessive rents."

In like manner the town holdings committee, in their final report, recommended the local application of enfranchisement generally on the following grounds. "After the statements made before us by various witnesses, we cannot doubt that the ownership by a working man of the house he occupies is one of the strongest inducements to those habits of life which make him a good citizen and a useful member of the community, and that this stimulus is more strongly felt in the case of a man who has, or can obtain, the freehold than in that of a lessee for a term of years." Further, "with regard, however, to improvements which lessees holding under existing leases may hereafter desire to make, a measure of enfranchisement would place such lessees in a better position by enabling them to acquire the freehold before making the contemplated outlay. So far as the power of enfranchisement would promote such improvements, it may be looked upon as a benefit to the public." They therefore recommended the local application of enfranchisement generally. It appears to the committee that these considerations of general policy are applicable to Scotland as well as to England, and they therefore advise that provision should be made by legislation for the enfranchisement of building leases in Scotland, whether these leases are for a term of years or upon a tenancy at will.

Two methods of bringing about this result might be adopted either (1) by compelling the lessors to sell the value of their interest for a present capital payment, or (2) by providing that the lessee should obtain a permanent right of feu upon his becoming liable for such feu duty as would fairly represent the value of the rights which the lessor has in the subject when enfranchisement is claimed.

The lessor might be required, upon receiving a notice from the lessee, to estimate the present value of his interest, the

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lessee desiring enfranchisement at the same time giving a statement of what he considers the fair value of that interest, and if they could not come to an agreement the difference between them might be authoritatively and finally settled by statutory arbitration. The consideration to be paid by the lessee, whether it was a capital sum, as for an out-and-out purchase, or a feu duty, as for a permanent right of feu, could be easily settled by an arbitration tribunal.

If the lease contained building restrictions, or obligations agreed to in the interest of the lessor as such, or in the interests of the adjoining lessees or other persons, such restrictions might be duly conserved, either in the conveyance which the lessor would grant to the lessee, as upon a purchase, for a payment of a capital sum, or in the feu grant which he would execute, if it was decided to convert the leasehold right into a feu.

The next question to which the committee would advert is one which has long excited much interest in various parts of Scotland. It is alleged that there are towns and villages situated upon the property of proprietors who do not desire the extension of the towns or villages, and decline to give land, either for building houses or for industrial purposes, in their vicinity, either absolutely or on lease, except upon prohibitive terms. The effect of this is said to be not only to prevent the natural expansion of such communities, but to lead to their decay, as in these days, if a community does not advance, it is almost certain to retrograde.

Such a state of things is, in the judgment of the committee, a public evil demanding remedy by legislation.

The remedy which the committee would suggest is that the local authority, whether town council, county council, or other elected body, should be empowered to purchase land by agreement, or compulsorily, for the purposes either of providing sites for dwellings for workmen or other persons, or of otherwise providing for the present or prospective development of the town or village. It appears to the committee that, subject to the review or control immediately afterwards suggested, considerable latitude might be left to the local authorities, both as to the purposes for which the land might be acquired, and as to the manner in which it should be dealt with when acquired, whether by letting on lease, feuing or selling, to the persons by whom it was to be occupied. It might be provided that before a local authority should proceed to acquire land for the purposes in question, it should issue notices to apprise all persons interested of what was proposed, and that any rate-

payer within the area of the local authority should be entitled to represent to the Secretary for Scotland, or to the Board proposed to be constituted under the Local Government (Scotland) Bill now before Parliament, against the contemplated acquisition of land. If, in the judgment of the Secretary for Scotland, or the Board, sufficient grounds should be established for prohibiting the proposed acquisition, the Secretary for Scotland or the Board should have power to prohibit it.

Machinery for the acquisition of land, simpler and less expensive than that prescribed by the Lands Clauses Acts, might be provided, as has been done in the Parish Councils Act for England, in the Local Government (Scotland) Bill and in other Bills now before Parliament.

A question has been raised as to whether provision should be made for the compulsory acquisition of land for building dwelling-houses for public officials. The committee hope and believe that very few proprietors in Scotland would decline to give, upon reasonable terms, land which might be required as sites for dwelling-houses for the public officials concerned in the administration of justice, the investigation of crime and the preservation of the public peace, and they would not feel warranted in making an affirmative recommendation in the direction sought, in the absence of evidence that it is necessary.

THE PROPOSED HOSPITAL, EDINBURGH.

A REPORT by the College of Physicians on the various possible sites for a new city hospital has been circulated among the members of the public health committee of the Edinburgh Town Council. The conclusions which the committee of the college charged with the inspection and consideration of the sites have arrived at are as follows:—The proposed extension of the present City Hospital to the east is inexpedient for the following reasons. First, the site proposed to be acquired is on a much lower level than that occupied by the present buildings; second, the area of ground, including the site of the present hospital, being altogether only eight acres, is not sufficiently large for present requirements, and still less for future extension; third, it is inconvenient in position and form for a proper arrangement of the buildings, and the proposed connection by a bridge over the Pleasance, in the opinion of the committee, would be highly objectionable; and, fourth, it is in the midst of a dense population, and is in awkward proximity to blocks of building which cannot be removed,

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there being on both north and south sides large buildings connected with breweries which project into the site, narrowing it towards the east. Having regard to these objections, the committee have turned their attention to other available and suitable sites. In view of the fact that a fever hospital is being erected for Leith on the north side of Edinburgh near East Pilton, which would, in the event of union between Edinburgh and Leith for public health purposes, be a most convenient position for the northern districts of Edinburgh, the committee are of opinion that the best site for a new hospital would be one similarly situated in a convenient position on the south side of the town, which would correspondingly meet the requirements of the southern districts. Several such sites are available. The two which have commended themselves to the committee are the following:—First, an area at South Grange, including Craigmount Cricket Field, with the large dwelling-house of South Park upon it, Grange Terrace with garden grounds attached, and the road between the terrace and the field, which would be thrown into the grounds. The buildings thus acquired could all be utilised for administrative buildings, nurses' homes and servants' quarters. This site is about 17 acres in extent. The burgh engineer reports that "the upper subsoil is of an open gravelly nature, inclining to gravelly clay in the lower strata. The drainage is good; the sewer, which is good, has a powerful flow. The locality is not specially more subject to fogs or mists than any other quarter. The site has a gentle slope towards the south, and has thus a good exposure to the sun;" and "the situation is an airy one." It is equidistant from the Canongate and Dalry districts, and is only fifteen minutes' walk from the Royal Infirmary and New University Buildings. From the extent and open character of this site a fever hospital built upon it would not, in the opinion of the committee, have any injurious effect on the health of the surrounding community. Second, a site on the eastern slope of Blackford Hill to the south of the road leading from the Harrison Arch to Blackford Hill—about thirty acres in extent. This site has a good exposure, is not near any private residences, and is sufficient in area for an hospital built on the most approved principles and for future extension. It is, however, at a greater distance from the more populous districts of the city, and from the medical schools. The committee recommend that one or other of these sites should secured, be the former being for all purposes the most suitable. Other sites at Corstorphine Hill and in the Morning-side district have been considered, but these are not so con-

veniently situated either for the public or for the medical schools, and are therefore, in the opinion of the committee, less desirable. The committee have further had under consideration a proposal to retain the present hospital for certain of the fevers, especially typhoid fever, and to treat others, such as scarlet fever and measles, in a new hospital; but they are of opinion that such a proposal should not be entertained.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

19538. Charles Milne and Robert Barton, for "Improvements in and connected with sliding sash-windows."
 19553. Robert Henry Harvey and John William Blythe Unwin, for "Improvements relating to sash-fasteners for windows and safety-catches for door latches."
 19574. William Youlten, for "Improvements in sliding sash-boxed frames."
 19787. Joseph Breeden & Co., Limited, and Francis Breeden, for "Improvements in flushing apparatus for water-closets and other places."
 19795. Cuthbert Burnett, for "Improvements in the so-called Forster pipe joint."
 19813. Stanley Cooper, for "An improved method of attaching sash-cords to windows."
 19829. John Tullock, for "Improvements in tubular bricks or blocks and wall linings for fireproof buildings."
 19933. Matthew Joseph McNamara, for "Improvements in flushing cisterns."
 19984. William Edward, for "Improvements in or connected with water-closet flushing cisterns and their valves."
 20031. Ferdinand Müller, for "Lid with self-acting peat-mould distributing arrangement for closets?"

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THE "WASH-OUT" CLOSET

(PATENT).

THREE AWARDS AT THE INTERNATIONAL MEDICAL SANITARY EXHIBITION, SOUTH KENSINGTON, 1881.

No. 234.



WASH-OUT.

"How to Drain a House," from a paper by T. MELLARD READE, ESQ., C.E., F.R.I.B.A., read before the Liverpool Architectural Society:—"I consider the pan-closet objectionable, especially since the introduction of the two-gallon regulating cistern has increased the difficulty of getting the after-flush to fill the pan. The 'container' is usually a reservoir coated with filth, hidden by the pan holding the water in the basin. A basin with a trap at the side or back, called a 'WASH-OUT' basin, is a far better apparatus."

"Improvement on Sanitary Condition of Houses," from a paper by J. CORBETT, ESQ., read before the Social Science Congress, Manchester, 1879:—"We replace defective Closet Appliances by the simple 'WASH-OUT CLOSET,' which is of white earthenware, without any valve, and so perfectly self-cleansing as to require very little attention."

Extract from a letter by "M. O. H.," a Medical Officer of Health, *Daily Telegraph*, September 22, 1880:—"The Local Government Board forbids the use of these pan-closets. . . . They may be easily replaced by one of the 'WASH-OUT' CLOSET Basins."

Extract from a lecture by W. EASSIE, ESQ., C.E., at the International Health Exhibition, May 28, 1884:—"A cleanly 'WASH-OUT' Flushing Rim Basin in connection with a small Flushing Tank overhead which merely required a touch of the depending chain and ring to liberate the whole contents."

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CONTRACTS OPEN.

ABERDARE.—Nov. 26.—For Building Thirty-three Houses. Mr. C. H. Elford, Architect, 34 Canon Street, Aberdare.

ACCRINGTON.—Nov. 13.—For Pulling-down and Rebuilding St. James's Schools. Mr. Bell, 14 Grimshawe Street, Burnley.

BECKENHAM.—Nov. 19.—For Store Yard for Sanitary Inspector. Mr. J. A. Angell, Surveyor, Local Board Offices, Beckenham.

BELFAST.—Nov. 14.—For New Buildings for Young Men's Christian Association. Mr. Hunter, Waring Street, Belfast.

BELFAST.—Nov. 10.—For Building National Schools. Mr. S. Hunter, Waring Street, Belfast.

BIERTON.—Nov. 14.—For Rebuilding Eagle Tavern. Mr. F. W. Taylor, Architect, Aylesbury.

BURNWOOD.—Nov. 12.—For the Construction of Additional Wards at Staffordshire County Lunatic Asylum. Mr. Stanger, Queen's Chambers, North Street, Wolverhampton.

CARDIFF.—Congregational School. Messrs. Habershon & Fawckner, Architects, Cardiff.

DAGENHAM.—Nov. 15.—Infants' School (270 children). Messrs. Wigg, Oliver & Dudson, Architects, 80 Leman Street, Whitechapel.

EAST MOLESEY.—Nov. 14.—For Boilers, Air-compressing Plant, Air Mains, Ejectors, Pumps, Steam Engines, Sludge Pressing Plant and other Machinery. Mr. J. C. Mellis, Engineer, 264 Gresham House, Old Broad Street, E.C.

GIDLEIGH.—Rectory. Mr. James Jerman, Architect, 5 Bedford Circus, Exeter.

HIGH ONGAR.—Nov. 19.—School Buildings. Mr. Mawhood, Architect, 2 Market Road, Chelmsford.

KEIGHLEY.—Nov. 10.—For Brick and Pipe Outfall Sewer 930 Yards). The Borough Engineer.

LEEDS.—Nov. 9.—For Building Wesleyan School, Richmond Hill. Mr. G. F. Danby, Architect, 46 Great George Street, Leeds.

LEICESTER.—Nov. 26.—For Constructing Shelter at Recreation Grounds. Mr. E. G. Mawbey, Borough Surveyor.

LICHFIELD.—Nov. 12.—Additions to Lunatic Asylum, Burntwood. Mr. Stanger, Architect, Queen's Chambers, North Street, Wolverhampton.

NEWHAVEN.—Nov. 12.—For Building Board Schools. Messrs. Clayton & Black, Architects, 152 North Street, Brighton.

PORTREATH.—Nov. 24.—For Infants' School, &c. Mr. S. Hill, Architect, Redruth.

SELBY.—Nov. 19.—For Additions to School and Master's House, Cliffe. Mr. T. S. Ullathorne, Architect, Selby.

SOUTHWARK.—Nov. 15.—For Extension of Drainage Work at St. George's Workhouse. Messrs. Henry Jarvis & Son, 29 Trinity Square, S.E.

STIFFORD.—Nov. 14.—For Erection of a Mixed School. Mr. A. J. Gale, F.R.I.B.A., 4 Serjeants' Inn, E.C.

TREFOREST.—Nov. 13.—For Extension of Gasworks. Mr. T. Newbigging, Engineer, 5 Norfolk Street, Manchester.

WARE.—Nov. 19.—For Additions and Alteration of Drainage, Workhouse. Messrs. Newman & Newman, Architects, 31 Tooley Street, London Bridge.

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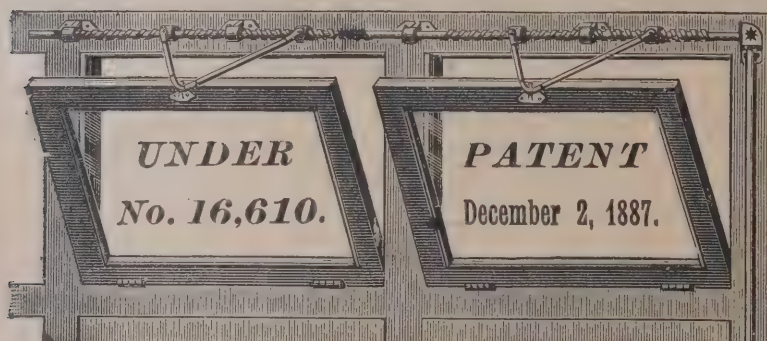
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H. Crane	200	0	0
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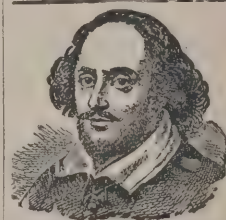
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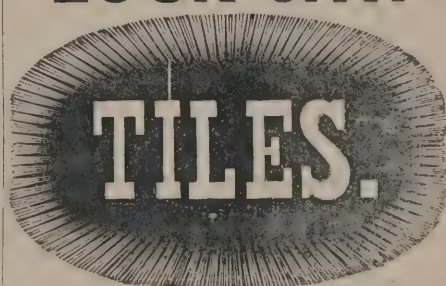
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C. Bray, Burnley . . .	413 4 7
J. Wadge, Burnley . . .	401 3 1
J. H. Cook, Ashton-on-Ribble . . .	394 18 4
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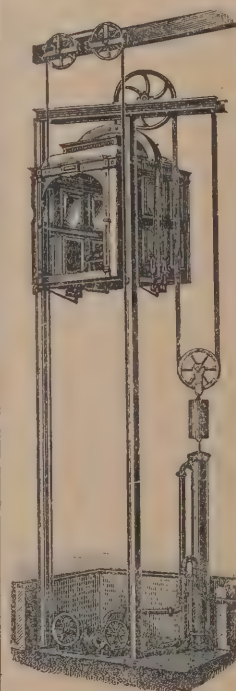
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G. Gradon & Son, Durham	1,566	17	0
C. W. Gibson, Durham	1,564	1	2
G. Bradley, Durham	1,552	3	0
W. WARDROPPER, Durham (accepted)	1,550	0	0
J. Whaley, Durham (withdrawn)	1,490	0	0

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J. Neave, Forest Hill, S.E.	4,946	19	4
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B. Cooke & Co., Battersea	4,728	0	0
A. Kellett, Willesden	4,666	1	9
W. Oldman, Finsbury Park	4,600	0	0
J. Jackson, Plaistow, E.	4,480	6	8
R. BALLARD, Limited, Child's Hill (accepted)	4,377	0	0
J. Bloomfield, Tottenham	4,234	0	11
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R. Entwisle	59	0	0
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W. WRIGHTMAN (accepted)	155	0	0

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J. B. BANKS (accepted)	11	10	0

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R. Raiton	8	16	6
W. HALL (accepted)	6	10	0

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W. Shurmur	£1,849	0	0
Hearle & Farrow	1,729	0	0
W. J. Walker	1,699	0	0
Wall & Co.	1,679	0	0
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J. & B. Swatman, Lowestoft	5,776	0 0
Girling & Coe, Ipswich	5,597	0 0
S. Smith, Norwich	5,555	0 0
Youngs & Son, Norwich	5,549	0 0
W. Cork, Great Yarmouth	5,499	0 0
H. Lacey, Norwich	5,457	0 0
O. J. Kemp, Kirkley	5,300	0 0
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H. Wall	159	0 0
Killingback	153	7 3
H. G. DAVENALL, Southampton Works, Gospel Oak (accepted)	146	0 0
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M. Calnan & Co.	690	0 0
A. Black & Son	670	0 0
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G. Wimpey & Co., Hammersmith	324	0 0
Greenham, Hammersmith	300	0 0
J. Ball, Chiswick	289	0 0
<i>York.</i>		
Robertson & Grant	169	0 0
G. Wimpey & Co.	151	0 0
Nowell & Robson	150	0 0
<i>Admant.</i>		
G. Wimpey & Co.	110	0 0
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Victoria Stone Company, Kingsland	115	0 0
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Victoria Stone Company	97	0 0
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Imperial Stone Company, Greenwich	110	0 0
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G. Wimpey & Co.	110	0 0
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Greenham	115	0 0
J. Knight, West Brompton	104	0 0
Nowell & Robson	100	0 0
J. Ball	95	0 0
G. Wimpey & Co.	91	0 0
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Colls & Sons	7,248	0 0
Grover & Sons	7,085	0 0
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Battley, Sons & Holness.	10,347	0	0	100	0	0
J. J. Smith	10,300	0	0	50	0	0
Calnan & Co.	10,148	0	0	—		
Prestige & Co.	9,970	0	0	30	0	0
F. & H. F. Higgs	9,875	0	0	225	0	0
O. Craske & Co.	9,850	0	0	50	0	0
F. White & Son	9,720	0	0	80	0	0
G. Wade	9,700	0	0	120	0	0
F. Minter.	9,670	0	0	45	0	0
H. L. Holloway	9,643	0	0	120	0	0
W. Norton	9,588	0	0	50	0	0
F. Dupont	9,587	0	0	150	0	0
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For Erection of a Store for Books and Apparatus in Conjunction with a Store for Furniture, Bowling Green Lane, Clerkenwell, for the School Board.

R. A. Yerbury & Sons	£38,320	0	0
A. Reed & Son	36,426	0	0
J. Shillitoe & Son	35,000	0	0
J. Grover & Son	34,753	0	0
W. Downs	34,570	0	0
J. F. Collinson	34,510	0	0
T. Boyce.	34,180	0	0
Stimpson & Co.	33,950	0	0
E. Lawrance & Sons	33,350	0	0
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LONDON—continued.

For Erecting New Offices for the Boys' and Girls' Departments of the Southwark Park School, Bermondsey, and Providing New System of Drainage.

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G. Parker.	1,390	0	0
G. Newton	1,313	0	0
H. King & Sons	1,290	0	0
M. Calnan & Co.	1,231	0	0
Stevens Bros.	1,226	0	0

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Hart Bros.	£3,060	0	0	£55	0	0
Clarke & Bracey.	2,966	0	0	63	0	0
W. Downs	2,944	0	0	50	0	0
J. & M. Patrick	2,915	0	0	61	0	0
E. Lawrance & Sons	2,887	0	0	55	0	0
Holloway Bros.	2,873	0	0	49	0	0
B. E. Nightingale	2,859	0	0	58	0	0
J. Marsland.	2,857	0	0	60	0	0
Holliday & Greenwood	2,848	0	0	59	0	0
N. Lidstone	2,692	16	10	52	0	0

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For Additions to the Infants' School, Seaford. Mr. A. CURTIS CARD, F.S.I., Surveyor.

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Foster & Dicksee, Rugby	998	0	0
J. Vinall, Eastbourne	850	0	0
Berry, Seaford	749	5	0
C. MORLING, Seaford (accepted)	715	0	0
Watson, Steyning	529	0	0

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For Building Infants' School for South Normanton School Board.

J. Roe & Son, Alfreton	£2,005	16	6
Messom, Nottingham	1,723	0	0
G. Smedley, South Normanton	1,683	0	0
F. G. Stubbs, Eastwood	1,626	17	6
H. Vickers, Nottingham	1,580	0	0
J. H. Vickers, Nottingham	1,574	0	0
CHARLES GREEN, Rotherham (accepted).	1,544	10	0



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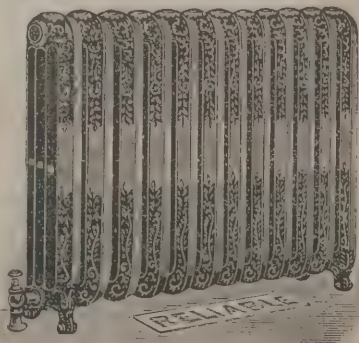
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Pond, Yarmouth.	47	0	0

TRADE NOTES.

THE Carlisle city authorities, through their surveyor, Mr. W. Howard-Smith, C.E., have given instructions to Messrs. Wm. Potts & Sons, of 13 Guildford Street, Leeds, and 22 Collingwood Street, Newcastle-on-Tyne, to make and erect a new illuminated turret clock with four external dials in the tower of the Tullie House, or fine art gallery, which is one of the finest in the kingdom. Messrs. Potts made the clock for the new markets, which has given every satisfaction to all concerned.

THE Altofts Schools, near Wakefield, are being warmed and ventilated by means of Shorland's patent Manchester grates and stoves, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

ONE Grinnell sprinkler was set in action by a fire (and immediately extinguished it) that occurred on September 27 in the scutching room of the Hill Top Cotton Mill Company, Limited, Burnley. Loss, 15/. The firm are highly pleased with the efficiency of the Grinnell.

THE tender of Mr. Frank Robinson, Thornton, for the construction of works required for dealing with sewage has been accepted by the Thornton Local Board for 3,057/. Conditionally, thirteen tenders were received.

WE are informed that Mr. George Jacques, of Spring Bank, Silsden, has given instructions to the architects, Messrs. Bailey,

of Bradford and Keighley, to raise the tower of Silsden Parish Church, Keighley, and place a spire on the top of the above, and also instructed Messrs. W. Potts & Sons, of Leeds and Newcastle-on-Tyne, clock manufacturers, to make and fix a clock with four external illuminated dials and Cambridge chimes in the same.

VARIETIES.

IT is not often so compact a building estate is obtainable as the one which will be offered for sale by Messrs. E. & H. Lumley on the 20th inst. The freehold house, "Ivy Lodge," and grounds containing 1 acre 3 roods 16 perches will be then sold at the Mart unless previously acquired by private treaty. The lot is an almost unique piece of open ground, for it has a frontage to the Fulham Road exceeding 300 feet, and it is needless to say that in the district houses are eagerly sought.

AT the meeting of the joint committee of the members of the Droitwich School Board and the managers of the National schools held at the Town Hall, Mr. Sheppard, Worcester, architect, produced plans for a new school to be built at an estimated cost of 1,450/, and alterations and additions to the present schools of 1,150/. The Rev. E. M. Barnly said he would be responsible for 1,000/. Mr. Corbett has given the site, and the subscriptions reach 1,600/.

THE interest in the Claridge's Hotel sale has been kept up with spirit, the same faces appearing day after day. Many of the aristocracy attended or were represented, and bidders were attracted from Paris, Berlin and America, also from various parts of the provinces in large numbers. Many of the lots were comparatively unimportant, but any lot possessing interest was keenly competed for. We are pleased to inform our readers that the beautiful specimen of seventeenth-century carving, lot 524, the carved mantelpiece and overmantel, is to be retained in this country to be utilised in the new hotel, at the desire of his Grace the Duke of Westminster, the freeholder. Commencing at 5 guineas the biddings were prompt and spirited, and the hammer fell amid considerable applause at 180 guineas. One of the smaller Louis Seize clocks went for 10½ guineas (Parker). The Empire clock the auctioneer considers was given away for 15 guineas (Flumeg), as was also a portrait of a lady, by Romney, lot 362, for 26 guineas (Tooth); lot 965, a small picture by De Franck, 45 guineas (Bradford); lot 551, carved oak cabinet, 34½ guineas (Spillman). The sale of the

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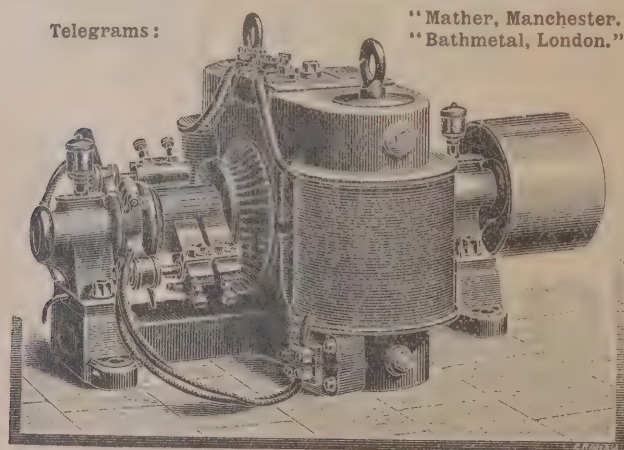
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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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AWARDS OBTAINED: LONDON, 1862, 1874; PARIS, 1867, 1878; CHICAGO, 1893.

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147 STRAND, LONDON, W.C.

more important items, including the appointments of the Royal suite of apartments, the antique plate, old Sheffield plate, objets d'art, &c., commenced on Monday, the 5th. The rostrum has been occupied during the whole of the week by Mr. George A. Bickerton.

THE Mersey Dock Board have confirmed the recommendation of the warehouse committee that hydraulic power should be applied to three hand cranes and that a hydraulic press should be provided for tobacco at the King's Dock tobacco warehouse, at an estimated cost of 350/.

AT the meeting of the Altrincham Local Board a letter was read from the Local Government Board sanctioning a loan of 3,500/ for work of street improvement, and of 1,100/ for the completion of the free library and technical schools. It was decided to apply for sanction to a loan of 2,500/ for land and buildings for a town's yard.

AN inquiry has been held at Walsall with reference to an application on the part of the Town Council for sanction to a loan of 12,450/ for the purposes of street improvement and sewerage, for the purchase of a steam fire-engine and the extension of a fire-brigade station, and for the purposes of a public pleasure ground.

AT Carlisle Dr. Hair was prosecuted for having failed to comply with a notice served by the Urban Sanitary Authority, requiring him to disconnect the drainage of his house from an old brick sewer at the back, which had become choked up, and connect with the main sewer of the city in the Crescent itself. The sewer at the back of the house was proved to be an old one, into which a number of properties are drained, and the bench held that by the Public Health Act of 1875 it became vested in the Urban Authority, who are now responsible for it. The summons against Dr. Hair was accordingly dismissed, with costs.

THE Swiss authorities have sanctioned the construction of the proposed Jungfrau railway. At its highest extremity it will be a tunnel rising in spirals in the interior of the mountain. It will end in a little rocky plateau on the western slope of the summit, the last ascent being finished by a lift. The narrow ridge at the top of the mountain is to be levelled by blasting.

THE War Office is making arrangements for the transformation of the old prison at Woking into infantry barracks, to be named Inkerman Barracks.

A LECTURE was given on Wednesday night, the 31st ult., in the Co-operative Society's Class-rooms, Accrington, by Dr. C. H. Wade, M.A., Oxford, D.P.H., on the plumber and his work, dealing in detail with the science and art of plumbing and the need for efficient registration of qualified men. The lecture was given under the auspices of the County Council for Lancashire.

AT Retford a Local Government inquiry has been held as to the application of the Town Council to borrow 2,000/ for the erection of baths.

A BUILDER in Paisley has been fined 5/ with the alternative of fourteen days' imprisonment, for erecting a house in which the height of the ceiling of the ground floor was only 9 feet 4 inches, while according to the plan it should have been 9 feet 6 inches; and also that the width of the close and staircase was 3 feet 9 inches, instead of 4 feet. It was explained that the builder had acted in mistake, as he had read the plan from brick to brick and from joist to joist, without allowing for plaster. It was also pointed out that, whilst the height of the upper floors could have been made 9 feet, they had been made 9 feet 6 inches. The Dean of Guild Court was, however, inexorable.

THE Mayor of Oxford (Ald. Gray) entertained the employés of Mr. Thomas Axtell, the contractor for the new Corn Exchange and Fire Brigade Station in George Street, at a "sumptuous repast."

THE total amount expended in rebuilding the nave, restoring the north transept and the partial restoration of the south transept of St. Saviour's, Southwark, is stated to exceed 31,000/.

A COMPANY is now being formed, with a capital of 120,000/, for the purpose of developing and working the Creevelea iron mines in co. Leitrim, as well as to utilise the raw peat in the manufacture of peat charcoal, not only for the smelting of iron ore, but likewise to manufacture the charcoal, so that it may be efficiently used for domestic purposes, a necessity much felt in Ireland, where all the coal of good quality has to be imported.

BETWEEN 200 and 300 unionist carpenters and bricklayers, who were employed by Messrs. G. Trollope, have struck work as a protest against the introduction of non-union labour. A special levy has been made in all the branches of the Building Trades Federation in order that a large sum of money may be in hand should a general strike take place.

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A STUDENTS' Association in connection with the Institution of Civil Engineers has been formed in Leeds.

FOR some time past St. John's parish church, Egremont, has been undergoing a thorough process of cleaning, decorating, and extensive improvements. The beautifying has now been completed, and the church reopened. The decorative work carried out by Messrs. G. H. Morton & Son is most praiseworthy, and redounds to their credit. Assisted by their staff of artists, they have throughout worked with interest and demonstrated a large amount of knowledge and research in the symbolism of early Christian art.

THE INCANDESCENT GASLIGHT COMPANY, LIMITED.

THE new factory of this Company in Palmer Street, Westminster was open for inspection on Tuesday, and visitors were conducted round and, as far as time allowed, the process of manufacture of "mantles" explained. The system is Dr. Auer von Welsbach's incandescent gaslight system. One feature is the burning of ordinary gas with air admixed through a Bunsen burner, which can be screwed on to any ordinary gas fitting. A regulator attached to the burner counteracts effects from variations of pressure. Attached to the burner is the mantle. The manufacture of these mantles is a business in itself, ordinary cotton thread knitted into form. The first step is the conversion of cotton thread into long tubes by knitting machines, each armed with over one hundred needles. These strips are made in long lengths, and at intervals of about 5 inches a double texture is knitted, forming, as it were, joints where the cuts will be made for each mantle. The knitted product is washed in distilled water, stretched and carefully dried in convenient lengths. They are next impregnated or put through a special fluid preparation, the chemical components of which it is not necessary to mention, which imparts to them the requisite incandescent properties, passed between rollers and then sent to the drying-room, kept at a high temperature by gas stoves. Here they are hung on glass rods and are kept constantly turned. When perfectly dried the mantles are removed to another department, moulded to the proper form and mounted on little supporting rods. In the next operation care and skill are required. The mantles are burnt in a Bunsen

flame, when the cotton material is all consumed, leaving a skeleton of the mineral substances. They are then burned over a gas flame for some hours, first with a chimney on the burner and then without, after which the mantles are ready for use. In order, however, to preserve them the better when travelling and to enable them to withstand rough usage, they are toughened by being steeped in a special fluid, and packed separately in cotton wool in tiny circular boxes. The light is a most brilliant one and more adapted for outside purposes than inside, except where very large interior spaces have to be illuminated, as the heat given off is considerable. The chemical nature of the light may be judged of when it is mentioned that most beautiful photographs are taken by it. There is on the premises an immense stock of lamps, brackets, stands, shades, &c., but the company should also lay themselves out to work from special designs, when required, so as to suit the wishes of all clients.

HAREWOOD HOUSE.

THE Council of the Royal Agricultural Society—Sir John Thorold, the president, in the chair—entertained the Duke of Westminster, Sir Walter Gilbey and others, to dinner on Tuesday night in Harewood House, Hanover Square, the new premises into possession of which the Society has entered. There followed a conversazione, at which upwards of six hundred guests were present, including Lord Egerton of Tatton, Lord Coventry, Viscount Evelyn, Earl Faversham, Lord Cathcart, Lord Moreton, Earl of Jersey, Mr. James Lowther, Mr. Cecil Parker, Professor Brown, Sir Jacob Wilson, &c.

Harewood House, 13 Hanover Square, formed a portion of a much larger block purchased by the Duke of Westminster and Sir Walter Gilbey, who gave the Council the option of acquiring the portion they wanted, for which, the necessary alterations included, the Society have paid 30,000*l*. The mansion was the residence of Lord Harewood and was built by Richard Adams, one of the famous brothers after whom the Adelphi took its name. All the rooms are of handsome proportions and are decorated in the Adams style.

The whole of the extensive additions, alterations and restoration has been carried out by Messrs. Holland & Hannen from the plans and under the direction of the architect, Mr. Arthur Vernon.

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 1, 1893).

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FOUNDATIONS IN DEEP AND UNRELIABLE SOILS.*

AN article in the *Engineering Record*, of New York, on "Foundations of High Buildings," by W. R. Hutton, M.Am.Soc.C.E., &c., has reminded me that in the province of Quebec we have had several failures of an expensive nature to make good, due to faulty foundations, as at Joliette, St. Bazile, St. Casimir, Nicolet, &c., and in Upper Canada at Cornwall and elsewhere.

As it is more satisfactory to know exactly how the foundations of certain tall and heavy structures have been built than to learn from any treatise on the subject how they should be laid down, I shall first summarise Mr. Hutton's article as extremely interesting and instructive to the profession, and then allude to the Canadian cases mentioned. In New York the rock is at from 15 to 50 and 70 feet below the surface, and overlaid by yellow sand mixed with clay and containing pockets or beds of quicksand. Many buildings rest on piles driven to refusal, though not necessarily to, nor always to, the rock. Under the city building law each pile may be loaded with 20 tons. The permanent wet level is about that of high tide in the harbour, and piles, not to decay, should be cut off at or about this level, dry seasons and deep drains, which may lower it, being taken into consideration. When a gap occurs in the rock, and bottom cannot be reached, an arch is thrown over to carry the walls above it, as was done in the case of the Washington (Field) Building on Battery Place.

The method of founding directly on the sand is gaining favour. The Equitable Building and the Union Trust are so built with wide footings loading the soil to 2 and 2½ tons to the

square foot. The *World* and *Times* buildings have similar foundations. Older buildings at only a few feet below the surface have suffered, probably from the lateral flow of quicksand into deeper neighbouring excavations. The newer buildings are at too great a depth to render such a result at all probable. When test-pits are sunk and quicksand makes its appearance, endangering adjoining structures, concrete should be at hand to promptly fill the pit and prevent the danger.

To save the cost of 15 to 20 feet of underpinning to the old walls of contiguous buildings, the foundations of the Methodist Book Concern were built in alternate piers surrounded with sheet piling, the intermediate piers then put in, the whole arched over, and walls raised upon them. In the case of the Manhattan Life Insurance Building, 353 feet high above street level, with foundations 55 feet deep to rock—a total of 408 feet—piles enough could not be driven to bear the great weight. The system adopted was that of pneumatic caissons. Fifteen of them, of which eleven are square, varying from 13 by 13 feet to 21 by 26 feet, and four circular ones from 9 to 15 feet in diameter, cover some 4,000 square feet, or about half the area of the site. The collective area of the caisson is proportioned to the maximum pressure allowed by city regulations, namely, from 150 lbs. to the square inch (say 11 tons to the foot), the brick piers being somewhat smaller, as they may be loaded to 200 lbs. to the inch, 14½ tons to the foot. The caisson roof is strengthened with I beams. The whole area is excavated to 20 feet in depth below the Broadway level, and the caissons are sunk by means of compressed air 35 feet further to the rock. They pass through 12 feet of fine micaceous sand, layers of mud with sand, of silt, of clay mixed with sand, and a very hard conglomerate over the usual gneiss-rock. The caissons were sunk by excavating the soil beneath them from the inside, and by the weight of the brick piers simultaneously built upon them, and to avoid an inflow of quicksand which might occur when the air pressure was reduced by blowing out the semi-fluid material through pipes, it was decided in the beginning to remove all material in buckets through the air locks; but upon trial it was ascertained that the pressure could be maintained while blowing out by running the compression faster, and the soft earth was thus removed. It is to be noted that any flow of quicksand from outside the lines of the caisson might have caused settlements of the neighbouring buildings. When the caissons reached the rock they were filled solidly with concrete. "At the date of writing," says Hutton (September 1893), "nearly all the caissons had been sunk to place and no appreciable

* A paper read at the annual meeting of the Province of Quebec Association of Architects by Mr. J. Nelson, president, and published in the *Canadian Architect*.

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cracks had occurred in adjacent buildings, one of which rests on piles at the level of the general excavations (20 feet below street level, as already stated), the other on the natural soil several feet above." The cost of these 55-foot foundations is said to have been 10 per cent. of the entire cost of the building. A commendable feature in the Manhattan Life Building is the symmetrical distribution of the load upon each pier. Commonly, foundation walls are built upon the outside edge of the property, with the footings almost entirely inside the thickness of the wall, concentrating upon the outer edge of the foundation-pressures much above the average. In the Manhattan Life the supports are centrally or symmetrically placed upon the caissons, and strong steel girders extending from side to side of the building sustain the side walls in "cantilever," to borrow a form of expression from the French. The engineer-contractors of the building, Messrs. Soozsmith & Co., made an interesting application of the same method in founding the draw-pier of the Seventh Avenue Bridge, New York. This is a circular pier 59 feet in diameter. Their experience having convinced them that there was great risk of cracks in the masonry from irregular movements of a very large caisson, this one was made annular in plan, 59 feet in outside diameter and 10 feet wide. When sunk upon the site, cemented to the rock and filled with concrete, it formed a coffer-dam within which it was expected to build the masonry "in the dry" after the water was pumped out, but seams in the rock-bottom of the central space admitted water faster than it could be removed by pumps, and it became necessary to cover the bottom with a layer of concrete put in place under water, to close the seams and permit the completion of the pier.

In Chicago foundations are more difficult and costly, due to the fact that instead of only 30 feet to 50 feet, as in New York, there is from 60 to 100 feet of blue drift clay overlying the rock, a material having a greater avidity for water and containing beds of quicksand, and yet upon this soil Chicago boasts some of the highest buildings yet erected. Formerly platforms of timber were embedded in the clay, and piles rarely driven to the rock, but the great weight of recent structures requires that piles be driven to the rock, and the tops cut off below all future drainage, that they may be always "in the wet," or detached foundations under each wall and pier, with footings carefully proportioned in area to the weight to come upon them and to the resistance of the soil. The best practice limits the weight to 3,000 lbs. per square foot, or say $1\frac{1}{2}$ ton, but this is frequently exceeded. Some settlement is expected,

and it is sought by proportioning surfaces to weights as far as possible to render the settling uniform.

As the wide footings when of masonry must be built in high and narrow offsets, forming a truncated pyramid under each pier or wall, thus robbing basement floors of much of their height, the practice in Chicago and elsewhere, due to the comparative cheapness of iron or steel bars and beams, is to form the footings of tiers of these bars laid on a concrete foundation, each successive tier lying across or at right angles to the one below, or along and across the wall alternately; and as their greater transverse strength allows of a greater breadth of offset, the reduced thickness of the walls is reached more rapidly or in a lesser height, not exceeding from 18 to 30 inches, instead of from 7 to 8 feet in some cases where of masonry. The weight is said to be also thus reduced by about 4 per cent. of the load upon the pier. The bars or beams, sometimes of second-hand railroad iron, are first dipped in hot asphalt or tar, carefully bedded on and filled in, and covered with concrete to protect the metal from rust. Such a foundation is of course dependent on being at such a depth that the adjoining soil be undisturbed. As on account of the soft nature of the clay, as glazier's putty, it must flow laterally if not prevented from doing so, just as water supporting a vessel in a lock would do, or dry sand, any structure if not laterally retained by some solid surrounding. Some large buildings in Chicago have been erected upon a continuous platform of concrete, covering the whole area of the structure. The serious irregular settlement of a prominent public building constructed in this way, accompanied by cracks in the walls and in the concrete platform, has brought the method into disfavour. It has been applied with better results when the platform has been made with iron beams covered and protected with concrete.

It has been observed in Venice, a city founded on the marshy bottom of a lagoon, that many large buildings constructed in the fourteenth century and before, rest upon a platform of masonry broader than the building it supports. The masonry itself rests upon a bed of puddled clay which shows signs of a powerful artificial compression. These structures show no notable change, while many others of later date, built upon piles, show by numerous cracks the irregular settlements they have incurred. It is said that the tower of St. Mark's does not rest on piles.

A different method has been adopted for a part of the foundations of the new Stock Exchange in Chicago. The



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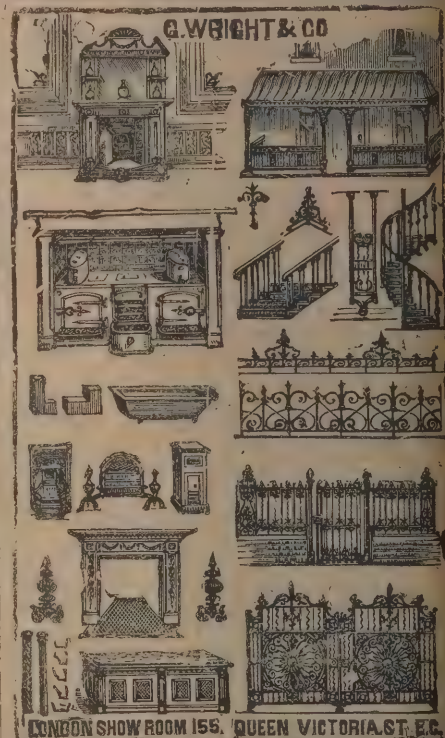
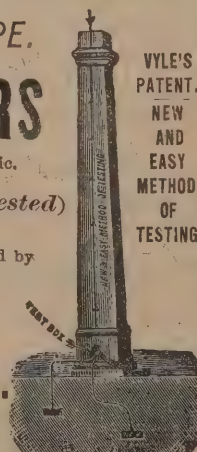
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WORKS, ROTHERHAM. Estab. 1854.

foundation is generally upon piles about 50 feet long, driven into the hard clay which overlies the rock; next to the *Herald* building, however, which adjoins it, wells were substituted, lest the shock of the pile driven close to its walls should cause settlement and cracks. A short cylinder 5 feet in diameter, made of steel plates, was first sunk by hand, reaching below the footings of the *Herald* building. Then around and inside the base of the cylinder sheet piles about $3\frac{1}{2}$ feet long were driven and held in place by a ring of steel inside their upper ends. The material inside the sheeting was excavated, and a similar steel ring was placed inside their lower ends; by means of wedges the lower ends of the sheeting were forced back into the soft clay until another course could be driven outside the lower ring. This operation was repeated until the excavation had reached the hard clay about 40 feet below the cellar. In this material the excavation was continued without sheeting, in the form of a hollow truncated cone, to a diameter of $7\frac{1}{2}$ feet, and the entire excavation was filled with concrete. The wells are spaced about 12 feet. The loads upon them vary; some of them will carry about 200 tons, something less than 4 tons to the square foot. The material excavated was a soft putty-like clay to a depth of 40 feet, where a firm clay was reached, deemed capable of carrying the weight proposed. The rest of the foundation is upon piles spaced 3 feet between centres, to be loaded with about 30 tons per pile, similar piles having been tested to 50 tons at the Chicago Library foundation. They are driven with a Nasmyth steam-hammer without brooming, are cut off below lake surface, capped and filled in with concrete. A series of short transverse I beams distribute the load transversely, and longitudinal beams prevent local settlements.

The foundations of the Washington monument at Washington have heretofore been well described, but having been commenced in 1848, now some forty-five years ago, a description of the method employed may not be uninteresting or unimportant to the younger members of the profession. This structure, when I visited Washington in 1856, had obtained a height of 156 feet. The monument was commenced on a national subscription then limited to 1 dol. per head, to afford every citizen the advantage of contributing his mite towards honouring the memory of the great man whose name it bore, and I myself have the honour of being one of the original subscribers, the receipt for which, of the size of an ordinary bank-note engraved on white paper of the consistency of a Bank of England note, with a cut of the finished monument at one end of it, I probably still have in one of my souvenir

albums. Almost every nation of the earth had contributed a souvenir in the shape of a block of its most precious stone or marble bearing a fitting inscription, and which were so placed as to be seen and felt and read by every one ascending the inner stairway, reaching at the time of my visit to the then top of the structure, and intended to be continued upwards to the full height of 600 feet then proposed; while hundreds of similar blocks from all the crowned heads of Europe, not excepting His Holiness the Pope—blocks of solid copper and nearly solid gold and silver and the like were either encased in the monument or lay strewn about the ground, awaiting each its turn to do honour to the "Father of his Country," the hero of liberty and independence.

At the date of my visit the works had been for some time interrupted, owing to unequal settlement of the foundation. In 1878, says Hutton, the work which had been in the hands of the Washington Monument Association was turned over to the general Government and completed with money appropriated by Congress. The work as finally constructed is a plain shaft 500 feet high with a pyramidion on top of it 55 feet in height. The shaft is 55 feet square at the base, 30 feet at top, the interior being say 20 feet in diameter and weight over 90,000 tons. The original foundation was of rubble masonry in lime mortar, $23\frac{1}{2}$ feet thick and 80 feet square at the base, the footings thus projecting $12\frac{1}{2}$ feet all around beyond the outer lines of shaft. The soil upon which it rested was a sandy clay; 13 feet below this was a bed of gravel. The area of the base was too small, and the soil under it not sufficiently resisting to carry the final weight. A mass of concrete $13\frac{1}{2}$ feet thick, extending 23 feet 6 inches outside of the old base and 18 feet under it, increased the bearing surface and carried it down to the gravel. The concrete extended 5 feet under the walls of the shaft itself. The construction of this block of concrete under a shaft 156 feet high and weighing 36,000 tons was a delicate operation accomplished in this way:—On the east and west sides, near corners diagonally opposite, cuts or trenches 4 feet wide and $13\frac{1}{2}$ feet deep were made from the outer lines of the foundation and extended by tunnelling 18 feet under the base of the old foundation. When completed they were filled with concrete, and other cuts opposite to them were made in like manner, carried under the old base and filled with concrete. The removal of so much bearing surface in these two tunnels under the old foundation was sufficient to cause motion in the structure, and after this but one cut was made at one time. The work was continued and completed by this system

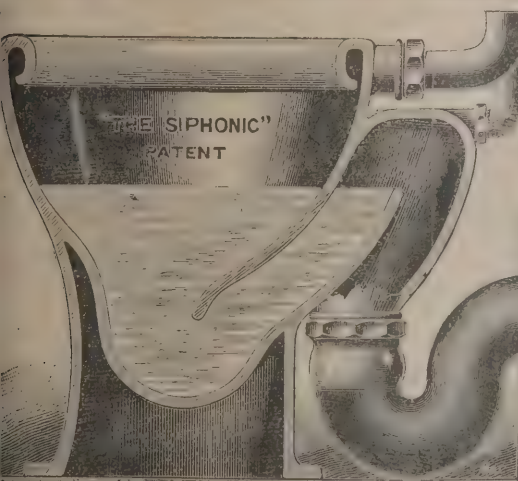
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of narrow cuts, which were filled with concrete until the entire sub-base was finished. After this 10 feet in thickness of the outer part of the old foundation was removed in sections 10 feet wide and replaced with concrete extending 10 feet out on the new base.

Being under the impression that when I saw the monument, at that time 156 feet high, as stated, it inclined somewhat out of the perpendicular, and as Mr. Hutton, in describing the underpinning and strengthening of the foundation, did not allude to the fact, I wrote him through the *Engineering Record*, and my letter and his answer appeared in a recent issue of the journal to the effect that it did incline slightly, but that its rectification was effected through the process of underpinning, though he does not say precisely how. I remember, however, that previously to strengthening the foundations in the manner described it had been proposed to excavate beneath the monument, introduce a series of upper and under sills of heavy timber with uprights or posts between them, introducing some hundreds of jackscrews, and letting down the monument gradually on one side to the level of the other. This process I applied myself in a modified form and on a smaller scale in bringing back to verticality a factory chimney some 80 feet in height at Hook's mills, in Grant Street, Quebec. After cutting away a wedge-shaped slice of the brickwork from beneath the shaft, or between it and its foundation, by means of jackscrews it was let down by so much, the thickness of the wedge sawed out bearing the same proportion to the breadth of base as did the inclination over to the height of shaft, which inclined some 2 feet from the perpendicular.

Gravel and sand are counted among the incompressible materials for foundations when prevented from spreading sideways. The resistance to lateral spreading is usually furnished by the adjacent sand, and when this is insufficient the surface rises as the building sinks, precisely as water does around a vessel in a lock, with the additional weight of an incoming cargo.

(To be concluded.)

THE Liverpool School Board has adopted a recommendation of the education committee, that the sites and buildings committee be instructed to look out forthwith and negotiate for a site in Kirkdale for the erection of a permanent free school to accommodate 1,200 children.

SANDWICH CORPORATION WATERWORKS.

TUESDAY, the 30th ult., was the day fixed for formally taking over the waterworks from the contractor, and at 2.30 the Mayor and Corporation assembled at the Guild Hall, where carriages were awaiting to convey them to Woodnesborough, where the pumping station is situated. The party consisted of the Mayor, Major Mate, aldermen, councillors, Mr. Courtney, C.E., representing the engineers, Mr. Brown, C.E., Mr. Dick Baker, town clerk, Mr. A. J. Catt, borough surveyor, who has acted as clerk of the works, and Mr. Sprague, manager for the contractor, &c. At the foot of Beacon Hill the carriages drew up in front of the substantial red brick buildings, one of which sheltered the boilers and machinery, the other being intended for the engineer. The party from Sandwich were greeted by those who had already arrived, including Mr. W. E. Long, chairman of the Easby Rural Sanitary Authority. After a few remarks the Mayor, under the direction of Mr. Courtney, started the engines. The party then proceeded to the reservoir, and the Mayor, after a few appropriate words, opened the valve which admitted the water to the main leading to the town, Mr. W. E. Long doing the same with the valve on the main leading to Ash. The party were then driven back to Sandwich, where the Mayor tested one of the hydrants in Market Street with entire success. At the invitation of the Mayor, the members of the Council and a few friends attended at the Guild Hall to drink success to the undertaking. Speeches were made by the Mayor, Councillor Jacobs, Mr. Courtney and others. The boilers, engines and pumps are in duplicate, the pumps being capable of delivering 15,000 gallons of water per hour to the reservoir on Beacon Hill. They have been supplied by Messrs. Warner & Son, of Walton-on-the-Naze. Mr. H. Roberts, of West Bromwich, was contractor for the works, which have been designed and superintended by Messrs. Easton, Anderson & Goolden, the engineers.

NEW premises of the Royal United Service Institution in Whitehall will be opened in February, and under a new regulation the public are to be admitted on five days in the week at a charge of 6d., one day being reserved for holders of tickets issued by members. Nearly the whole of the contents of the museum have been removed from the old building and rearranged in the banqueting-hall of the palace.

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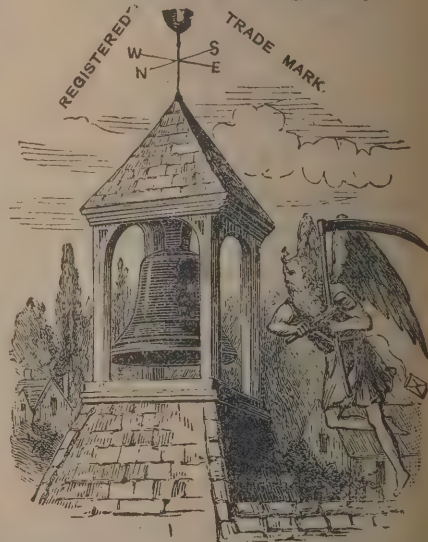
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Sydney Town Hall, N.S.W.	Durban Town Hall, S.A.
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	Royal Military Exhibition, &c., &c., &c.
	GOLD MEDALS—HUDDERSFIELD, 1883, LONDON, 1885.
	SILVER MEDAL—PARIS, 1889.

PORTLAND CEMENT.

THE following communication has been addressed by Messrs. Renshaw, Kekewich & Smith, the well-known solicitors of London, to all the cement manufacturers on the Thames and Medway, and a meeting of the manufacturers is shortly to be held in reference to the matter in question, which is of great importance to the trade:—

2 Suffolk Lane, London, E.C.:
October 26, 1894.

Sirs,—We are desired to call your attention to the following circumstances seriously affecting the trade in which you are engaged. It is becoming notorious that several manufacturers of English Portland cement are largely adulterating their manufacture by the mixture of Kentish rag stone, other stone, furnace or oven ashes, disused or exhausted firebricks or other inert material, and so bringing disrepute upon the good name English cement has hitherto borne in comparison for quality with cement of foreign manufacture. Such practices are so detrimental to the best interests of the cement trade, both by the discredit which is thereby attached to English manufactures and the unfair competition in prices thereby rendered possible, that it is now proposed to establish an association of English cement manufacturers for the purpose of dealing with and, if possible, putting a stop to a practice so unprincipled and disreputable, and so calculated to perpetuate an injury to the trade. We are instructed to inquire if you would be willing to join an association of cement manufacturers for this purpose, and if so we shall be glad to hear your views on the subject and to know if you would attend a meeting presently to be convened.—We are, gentlemen, your obedient servants,

RENSHAW, KEKEWICH & SMITH.

THE Corporation of Deal have agreed to purchase from the War Department for 35*l*. all that is left of Sandown Castle, erected by Henry VIII., with Deal and Walmer Castles for the purpose of defence. People are still living in Deal who can remember when there was a good stretch of land between the castle and the sea, but during the last half-century the sea has made great inroads upon this part of the coast, until the little that is left of the ruins is submerged at high water. The ruins are being acquired for sea defence purposes.

STREET TUNNELLING IN BIRMINGHAM.

THE new tunnel scheme of the London and North-Western and Midland Railway Companies has now invaded the principal streets of Birmingham to an extent, says the *Birmingham Post*, which enables the public to form some conception of the magnitude of the undertaking. The destructive portion of the work is practically completed, and a pretty big clearance has been made. Along a line extending side by side with the present railway for a distance of 622 yards—roughly, more than a third of a mile—a space about 22 yards in width has been taken in hand. Throughout this tract, which crosses New Bartholomew Street, Shut Lane, Moor Street, Nelson Passage, High Street (some distance above the Market Hall), and ends at the corner of Phillip Street and Worcester Street, the demolition of buildings has been going on apace, simultaneously with the more slowly-progressing work of constructing the brick arch of the new tunnel. The buildings on the west side of Worcester Street, erected on immense girders over the bell-mouth made to the old tunnel when the new part of the station was constructed, will not be interfered with. On the opposite side, however, near the corner of the Market Hall, two large shops in Worcester Street and four adjoining shops in Phillip Street have been pulled down, while the premises in the rear of some other buildings in Phillip Street have been affected to a greater or less extent, the line of the projected new railway and that of Phillip Street diverging, so that at the High Street end the opening for the former is two frontages higher than the street corner. In High Street, on the right-hand side going down, four large and well-known business establishments have come down, though their occupants have found accommodation not far away. On the opposite side, three large shops and a portion of the Lion and Lamb public-house have been sacrificed, while Nelson Passage, which opens into High Street a little further down, and used to lead deviously to Moor Street, has been cut across by the excavation, and is, for the present at any rate, a *cul de sac*. The besom of destruction has swept right across into Moor Street, at a point some distance below Castle Street, carrying away on the east side, between Scotland Passage and Nelson Passage, an important frontage of which the old Wesleyan Assurance Offices formed part, and on the west side a number of old offices, shops and back houses. The new line will tunnel side by side with the old under Shut Lane and the Great Western Railway, but from this point to St. Bartholomew Street the destructive work has been comparatively

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Birmingham
26th Sept '94.

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unimportant. In the purchase of properties, in compensation to owners and tenants, in pulling down buildings, and in propping and underpinning others an expense of something like 80,000*l.* has been incurred. The gaps in the principal streets, of course, will be filled up with new buildings, built where necessary on huge girders, and nearly the whole of the line will be covered and the ground again utilised for buildings, so that the preliminary outlay will not be altogether a dead loss.

If the whole length of this section were cleared and excavated before any constructive work was begun, we should have a fosse some 20 feet or 30 feet wide and a third of a mile long extending through one of the busiest parts of the city. At the corner of Worcester Street the depth would be more than 30 feet and the width would be increased by the short open portion of the old line near Swan Passage. Under or across High Street the excavation would run to a depth of about 35 feet from the surface of the roadway, while the lower part of Moor Street would be cut through to a depth of 25 feet or more, and the Great Western Railway, which goes under the street at a much higher point, would be tunnelled under at a depth of 20 feet or more. These depths are roughly those which have to be reached in order to lay the roadway of the new line. They would not be permanent and, as we have already hinted, the picture of this gigantic trench has only been suggested in order to give some idea of the immense amount of purely preliminary work. The section when constructed will consist of a double set of rails running through a tunnel 10 feet to the south of the present line. The rails at Worcester Street will be 27 feet below the street surface, at High Street $31\frac{1}{2}$ feet down, and at Moor Street $22\frac{1}{2}$ feet down, and will pass under the Great Western line $19\frac{1}{4}$ feet below the metals of the latter. From the station there will be a short decline of 1 in 96, increasing to one of 1 in 53 from Worcester Street to Shut Lane. From Shut Lane to Park Street the decline will be 1 in 60, after which, the new line passing under the Recreation Ground and rising 1 in 50, will emerge with its companion line into daylight at New Bartholomew Street and pass over New Canal Street and Fazeley Street by an extension of the old viaduct. From this point the extension is carried out on the north side of the old line, and that section of the work begins which has for its object the substitution of viaducts for the level-crossings of one railway over another, which hitherto have so complicated and hindered the North-Western and Midland traffic in and out of Birmingham.

The constructive part of the work, as far as the town section is concerned, is going on at present only in the neighbourhood of Park Street and Moor Street. The operations on the east side of Moor Street are considerably advanced. The ground having been excavated to about 10 feet below the contemplated level of the rails, the digging has ceased in the centre, but has been carried down at the sides below the extreme depths already mentioned, in order to lay the foundations of the abutments of the tunnel. The brickwork, which is 3 feet in thickness, is carried on until the arch of the tunnel (which has a 26-feet span) is completed, all the masonry work being done in the daylight. The core of earth will then be extracted, and the bed of the permanent-way laid. A very good illustration of this mode of working is to be seen on the east side of Moor Street, where some twenty or thirty yards of the masonry of the tunnel may be seen complete, with other portions in various stages of construction. The site also affords a good example of the geological conditions. The soft sandstone, while giving little trouble to the excavator, forms an excellent foundation for the brickwork, and is not liable to slips at the side of the cutting. As soon as the brickwork is fairly set the earth is heaped over it, and in due time the site will be re-covered with buildings. This method of working, known to engineers as "cut and cover," will be used at every point except two. Even Moor Street itself has been dealt with practically on this plan, the roadway having been cut through one Sunday and replaced on baulks of timber, forming a temporary bridge, under which the tunnel works have been going on. It may be necessary to cut through High Street in the same way. The roadway there, however, is so much further above the tunnel that boring would be more practicable in this case than in that of Moor Street. At any rate, that portion of the work will not be taken in hand for some months to come, and no notice has been given to the municipal authorities of any intention to interfere with the street. The really important exception to the "cut and cover" method, however, is to be found where the line passes under the Great Western Railway. This will be a long and troublesome piece of work, as a suspension of the Great Western traffic is out of the question. A temporary bridge will be built under the Great Western line with baulks of timber a foot and a half square and 60 feet long. Then the excavations will be carried to the required depth, and a permanent bridge, consisting of massive iron girders resting on masonry abutments, will be constructed. At one point the new line, like the old, will remain open to the sky, namely, near Swan Passage, to the north of Phillip Street. As for the passage under Worcester

Street, that will give very little trouble, as the street at the point of crossing is partly over the widened mouth of the old tunnel. The roadway is already more or less honeycombed with vaulting, and the buildings just taken down rested on immense girders, as those on the station side still do. The completion of the section will provide a new double line of rails running through a separate tunnel into the new portion of the station. The still more extensive, if not so imposing, sections of the work in the open, beyond New Bartholomew Street, will give the Midland practically independent access to a station under their own control, for traffic purposes, in the centre of Birmingham. The prior rights and running powers of the London and North-Western Company, however, are jealously reserved, and the whole of the works are being done in that company's name, under an Act of Parliament obtained by them and under the direction of their engineers, though the cost—which, including the various sections outside and some alterations in the station itself, will mount up to something over a quarter of a million—will be apportioned between the two companies. When the work is done, which will not be for eighteen months, there will be an end to the anomalous state of things under which a station containing six main platforms and fourteen sets of metals, and having a traffic of over three hundred trains a day, of which about a hundred and twenty use the new part of the station, has been served on its busiest side by a tunnel with only two lines of rails.

OLD AND NEW BUILDINGS IN EDINBURGH.

In a moment of regrettable dyspepsia Carlyle called our time an age of unbelief. In spite of his internal trouble, we still are holding firmly to our faith in things that are ancient—old pipes, old books, old friends (and in that number Horace), and old houses. In the last instance there has almost grown up a legend of a golden age. "You won't find work like that nowadays" is the remark made to workmen who come to patch up mansions built in the time of powder and patches. And the workman discreetly holds his tongue. Society is founded on fictions; the belief that our ancestors built well and firmly and with their eye cocked on perpetuity is a myth. Builders who are conversant with the secrets of our older streets and squares could tell a tale if they cared to speak. With no desire, in these dyspeptic days, to take an optimistic view of the present generation, we wish to say that the average quality of work in the building trade is far above that with which our grandfathers were contented, and that it is rising rapidly. In making odious comparisons between the new and the old, we have to remember that in the affairs of architecture the bad perishes, while the good remains. The workmanship in the houses of modern construction is superior to that of a former time, but through no fault of ours the material is worse. Virgin forests have been cut up, quarries are exhausted; nature is to blame. Our national income has been going up by leaps and bounds, and it is idle to suppose that no part of it has been diverted into building with increased care. Before we conclude we shall also find that Mr. Henry George's apothegm about the poor growing poorer dissolves itself into thin air.

Part of the superiority of the modern house has been due to our increase of knowledge. In those pseudo-classical mansions that cover the north side of our city with windy squares and crescents, most of the internal partitions are formed of lath and plaster, sounding hollow to the thump. Our ancestors were forced to build in this way, because the use of the iron beam was as yet unknown, and they were either compelled to carry their brick partitions from the bottom to the top, or use those of less durability. In a West End mansion it is clearly impossible to form the rooms on each flat like those below it, and brick was used as scantily as might be. In spite of the comic artist and his impossible sketches of the suburban villa, the lath and plaster partition has almost disappeared; it can scarcely be found even in the cheapest tenement; it is in danger of becoming a lost art, if to such a simple process we can apply so high a term. While we are thus referring indirectly to old carpenter-work, let us say that the deceased gentlemen who did it were not a bit better than they should have been. In constructing the framework to form a ceiling, the much-abused, long-suffering carpenter of these times uses wood of a definite size, $3\frac{1}{4}$ inches thick by $1\frac{1}{2}$ inch, and fastens these pieces to his joisting every three feet. His grandfather of pious memory was content to put the refuse of his wood-yard into this work, and seldom fixed his material any oftener than once in 7 or 8 feet. The consequences of this carpenterial sin are that his work is bent and twisted. Moray Place, Charlotte Square, well-to-do crescent and terrace—their ceilings hang suspended above the dinner-table by a few tacks; we have a vision of their coming down and burying up the old ladies and the poodle dogs that people Melville Street, along with their light wines and sacred silver *épergnes*. During some alterations in Royal Terrace some workmen were ordered to remove a ceiling in the upper part of the house. The men clambered between the framework and the roof, and proceeded

to strike down lath and plaster. No sooner, however, did they perceive what they were standing on than they rushed to the ladder. The carpenter-work carrying the whole was fashioned out of waste sap-wood cuttings from the edge of a log, and consequently decayed before it was put in. Yet this was the only road out to the roof, and for nearly a century the chimney-sweep had been walking over supports he could have snapped on his knee.

Not to make the internal economy of these houses as bare as Hippias Fernald laid his digestive apparatus, we may say that their carpentry is decidedly inferior to that of our time. It is true that the material, in the main, is excellent; faultless lengths of American pine that would, in these poorer days, be wrought up into doors and finishings, are buried deep in walls under coats of plaster, and the beams of Memel seem, like the Psalmist's doors, to endure for aye. But for that neither the master nor the workmen can be praised. Since then forests have been exhausted and even the Memel pine is now scarce and of inferior quality. Nevertheless, while the wood is excellent there is a general tendency to be far more sparing with it than would at present be thought safe. This disposition comes out in a thousand ways; but it will be sufficient illustration of an unlaudable economy if we say that the older builders frequently used for joisting battens 7 inches by 2½ inches, where we should now lay down deals of much greater strength, 9 inches by 3 inches.

To examine each of the trades connected with building by itself would entail a work as endless as the "Rime of Sir Tophas" and one as profitable. It will, however, scarcely be necessary to convince even the most ardent admirer of "rusty airs" and "auld world gear" as to the superiority of our sanitary arrangements. When Edinburgh made its extraordinary excursion across the Nor' Loch our ancestors had not got far beyond the "Gardez l'eau" stage, and there is even a horrible legend of some belated plumber, lately present in the flesh, who stood up in the steamer as she sailed out of Dublin Bay, and pathetically addressed that land of "gentlemen," "Farewell to ould Ireland," he said with emotion, "farewell; I'm lavin' ye widout a plumber"—a clear injustice to the island.

In the other trades there has been both loss and gain during the course of the century. The haste with which our contracts are pushed forward in these unquiet times does not always leave the plasterer time to let his lime mellow for a month or two after being mixed. But there are compensations. We have finer and firmer cements than our fathers could even have dreamed of, and the use of the narrow split lath, which only began to appear in Edinburgh when the greater part of our imposing streets and squares had been built, is a most important improvement in the work of those that handle the float and the trowel. The modern mason has given up the use of the old Craigleith stone, hard, close-grained, flecked with basalt, presenting a firm clear edge after the frost and storms of centuries, for softer material. When honestly used, however, the mortar-mill has been a great advantage, compensating us for a little of this loss. From a mixture of engine-ashes and sandstone and lime in proper proportions a cement can be made which in a few years hardens into something worse to cut than even the stones it binds together.

These trifling notes are not without an interest for the student of history. It will be seen at a glance that those trades which are not adapted for an extensive use of machinery have scarcely improved their work, or improved it only a little. In those into which machine labour has been imported enormous strides have taken place, and the advance has been in proportion to the use of mechanical helps. Some one with a pretty taste for figures and facts has calculated that about eighty or ninety per cent. of the work done in woodworking occupations is performed by the steam-engine. So far as the building trades are concerned this is certainly an over-statement, but with the hundred ingenious appliances that mould and cut and saw, that whirl and hum and dab in a workshop of the modern kind, the use has been great. The change that has followed has been more than wonderful. The old deal door has vanished from the workman's house, and its place has been taken by one with panels and mouldings. To fit up a house with moulded architraves and neat panelled work now costs so little extra that contractors put into their cheapest tenements luxuries that fifty years ago would only have been seen in a place of superior construction. Aladdin's wonderful lamp has been rubbed in a wood-yard. The change is significant of a democratic time; machinery has begun the process of levelling up.

The wealth of the country has multiplied itself ten times since Edinburgh took its first step across the Nor' Loch. It is idle to think that the building or any other trade could have remained stationary in the midst of this multiplication and remultiplication; but, as we have shown, this gain has largely been one in the condition of our poor. The increase of wealth has been due to machinery and improvements that come in its train, and in strict equity every moiety of this advance should

have gone to those who have earned it by seeking out labour-saving machines. But wealth, like water, tends to spread itself over a wide area. It has been calculated that labour, whose hand in these days is bared to strike, earns in its own right some 7% or 10% annually, a sum on which the men who built the streets and squares of Edinburgh a hundred years ago must have lived. As the average pay of the working-classes is now 54%, the steam-engine has enriched them with some 47% to which they have no moral claim.

The improvements that have taken place in the condition of the builder are, however, not all of this material kind. Strange as it may seem to one who only hears the sharp sound of saw and plane, the most laborious of all trades was the joiner's. The men were prematurely bent and aged by the heavy labour of "flogging," flooring and running lengths of deep moulding. All this is now done, and done better, by the aid of machinery. What is taking place in the one trade is, to a smaller degree, going on in them all, and in estimating the gain and loss of a century the fact should tell heavily against the fundamental contention of Socialism, that the condition of the worker grows more irksome. It is difficult to realise the extent of the improvement, but one incident may be noticed. At a period within an easy compass of the memory, workmen in the suburbs, who of course had to bring their meals with them, had either to heat up their own breakfast during the meal hour or take it cold. When nine o'clock struck the men might be seen climbing over fences in all directions to ask the servant maids to put their pitchers of coffee on the fire for a minute or two. All that has been changed, and an employer is now bound by one of the unwritten laws of the trade to provide some one to warm the flasks before meal time. It may be thought that this concession was wrung unwillingly from the masters by the powerful trade guilds. Nothing could be further from the truth. Adam Smith's principle of "higgling in the market" must have the credit. Builders found it difficult to induce men to work on the outskirts of the city, and offered this convenience as an inducement. Others in the centre of the town had to follow suit, and the concession has passed into one of the unwritten laws of the building trade. In spite of the gains which a century has brought them, workmen are as ready as ever to pipe their eye and say that things are not what they were in their young days. It is an old feature in our nature, not unrecognisable even in the "blind old man of Chios." In the same way the pessimism of age induces those who ought to know better to say that house-building is degenerating, and younger men conscious of the flaws in their own work are ready to join in a cry so deceptive to the public.

THE THIRLMERE ARBITRATION.

THE arbitration in the case of the Hon. James Lowther v. the Manchester Corporation was resumed before Mr. C. Oakley on the 1st inst. The claim on the part of Mr. Lowther, who is trustee for the Lonsdale estates, is for compensation in respect of an easement affected by the construction of the Thirlmere aqueduct through Grasmere Common, Spital Farm, Kendal and Hutton Roof Farm, Kirkby Lonsdale, and also in respect of stone got in the construction of the aqueduct through Westmorland on lands over which Lord Lonsdale is lord of the manor.

Mr. Balfour Browne, Q.C., for the Corporation, characterised the claim, says the *Manchester Guardian*, as being to a large extent unjustifiable in law and in fact. It was an attempt on the part of Lord Lonsdale and his advisers to blackmail the Corporation of Manchester, using "blackmail" in the sense in which the word had been used by Lord Salisbury in the House of Lords. Where no blackmail was attempted, an owner tried to get the value of the article taken from him; where blackmail was attempted, he desired to screw something out of another by reason of the latter's needs or necessities. The whole case was based on a series of fallacies both of fact and of law. The question of fact—the value of the article taken—would be established conclusively by the evidence. Of course they were accustomed in these cases to the exaggeration of figures. It was the usual trade of surveyors on one side or the other. But this was not a case of that sort. The whole claim was based on half a dozen fallacies, the most ridiculous ever put before an arbitrator. The arbitrator was asked to consider the question as one between a willing buyer and a willing seller, and also the value of the material, which in this case was stone, to the Corporation of Manchester; but he protested altogether against the introduction of the phrase willing buyer and willing seller. It was introduced with the view to get the arbitrator to look at what were the needs and necessities of Manchester in respect to its water supply, and to get him to put a value on the article from that point of view. This fallacy was finally exposed and decided in the Countess Ossalinski's case. It was equally a fallacy to look at this aque-

duct from the point of view of a wayleave. Wayleaves and willing buyers and sellers had nothing to do with the matter. It was the value of the material taken from Lord Lonsdale and the amount of the damage done to him that was the measure of what the arbitrator must give. The next fallacy was that the Corporation by going there had made a market for the stone—that they had used the stone for concrete. What did that matter? It must be shown apart from that that the stone had a value. But the claimant's advisers wanted to value the stone not at its value to him but to the Corporation. They admitted distinctly that they had not considered the damage done to Lord Lonsdale as the measure of the claim, and therein they were wrong. He was not suggesting that Lord Lonsdale should not receive payment for the stone taken; he only said that Lord Lonsdale should be paid the worth of the stone to him. The question was, what damage had been done to Lord Lonsdale, not what benefit had been done to the Corporation. That would upset the whole system of valuation. One might as well say that in assessing the value of a cottage taken for a railway the owner had a right to look at the traffic receipts of the line. The claimant had not the slightest right to consider what was the value or the benefit of the Thirlmere water to Manchester in estimating the damage. That would be "ransom" indeed. Any damage done must of course be paid for, and the damage done in this case was nothing, because there were countless millions of tons of this stone in the bowels of the earth. The learned counsel dwelt at length on the judgment of the Courts in the case of the Countess Ossalinski, wherein it was laid down that arbitrators were not to value land with reference to the particular purposes for which the land was required, particularly where the matter was under Parliamentary powers. This claim, he said, was founded not on the real value of the article to the claimant, not on what the thing would fetch in the market—for there was no market at all for the stone—but on its value to the Corporation, who for their own necessities had to get a certain quantity of it.

Sir J. Harwood, chairman of the waterworks committee, said the claim was of such an iniquitous character that if it was allowed all public works would be stopped. It would constitute the strongest case for the nationalisation of the land and of minerals he had ever heard. The whole industry of the country

would be paralysed if lords of the manor were allowed to slip in charges of this kind. In his opinion the stone had no value in this case. Apart from Manchester's use of the stone, there would have been no market for the article for hundreds and perhaps thousands of years to come. If the stone had been his property he would never have dreamed of asking anything for it. He considered the Corporation had rather improved Lord Lonsdale's property than otherwise. At the same time, although there was nothing for which to pay, because nothing of value had been taken, he recognised the fact that Lord Lonsdale was lord of the manor and would, as a matter of sentiment, offer some small recognition—sufficient to acknowledge the right.

In cross-examination, Sir J. Harwood said that even had the tunnel not gone through stone the cost of the work would not have been materially different, because there was an abundance of stone in the neighbourhood to be obtained at an almost nominal cost. You really seriously believe that if there had been no stone throughout the whole eighteen miles of Lord Lonsdale's property and stone had had to be obtained elsewhere such stone could be had for nothing?—It could be got almost anywhere. Are you an advocate of betterment?—I think so. Then if everybody had his rights Lord Lonsdale would rather pay you than be paid by you?—If betterment were in operation he would have to pay. I suppose you accept the statement that the stone is worth nothing and that therefore nothing ought to be paid for it?—I do. According to your view, no damage has been sustained?—None. Then why do you propose to pay Lord Lonsdale anything?—He is in the position of a man who has got a stable but has no horse. Lord Lonsdale had stone, which, according to you, he could not sell. Ultimately somebody comes and wants that stone. Ought not that somebody to pay for what he wants?—We are willing to pay for the wayleave in the same way we have paid everybody else. As far as you know, the tunnel through the manorial property has done no damage?—That is my view. You also say that the stone is worth nothing; then why do you propose to pay him anything?—Very little.

Answering further questions, Sir J. Harwood said this claim, if allowed, would not add materially to the cost of the Thirlmere scheme. The Corporation were resisting the prin-

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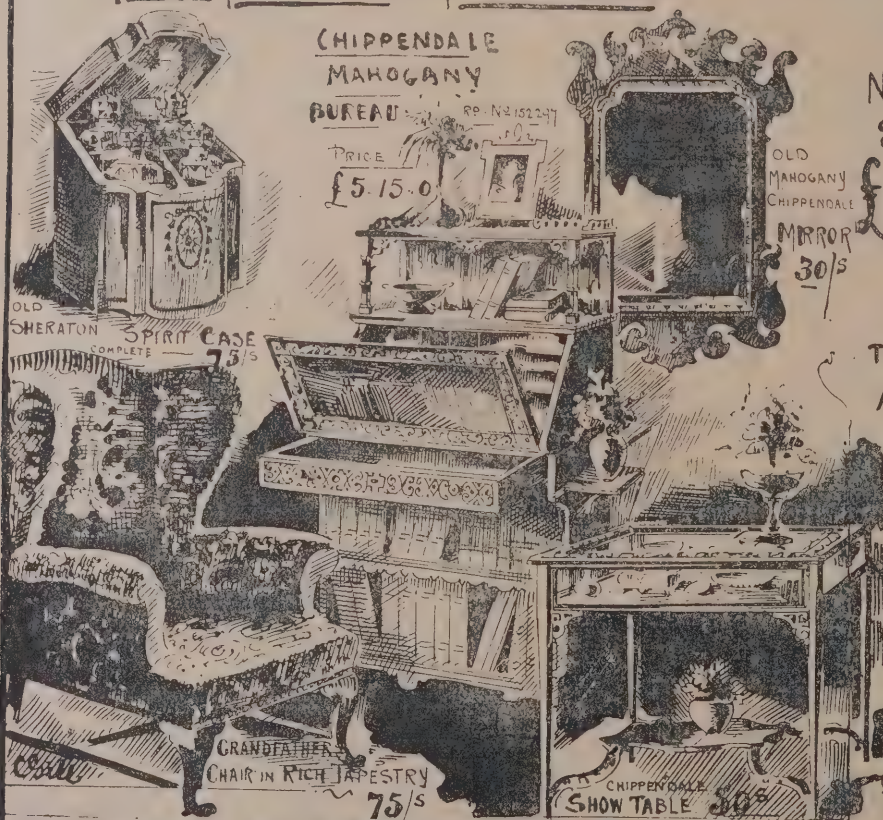
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ciple, not the amount. He did not say the stone got from the aqueduct was worthless to the contractor for concrete. It was, however, worthless to Lord Lonsdale. This was the last claim the Corporation had to deal with.

Mr. J. Bell, county surveyor, Carlisle, gave evidence to the effect that the stone got from Lord Lonsdale's property had no commercial value.

On the resumption of the arbitration for compensation for easement, evidence was given by Mr. Beattie, builder and contractor, Carlisle, Mr. T. Dirkin, contractor, Kendal, and Mr. T. Newton, builder and contractor, Ambleside, to the effect that the stone which was got in the construction of the Thirlmere aqueduct through Dunmail Raise, and which was used to make concrete, had no commercial value whatever. It simply abounded in the neighbourhood, which, as one witness said, was made of it, and people would be glad to have it carted away, so that they might grow grass instead of growing stone. These witnesses also testified that in their experience, which was extensive, they have never known a lord of the manor claim for the stone got in this way and used for concrete.

Mr. J. Hodgson, builder, Grasmere, stated that on what was known as Grasmere Common and on the line of the aqueduct there were many quarries, and the custom had been for anyone who wanted stone to go and get it. He had been in business himself for thirty-eight years, and he believed the custom was hundreds of years old. He had never paid anything to the lord of the manor either as royalty or quarry rent for this stone, and the representatives of the lord of the manor had never attempted to exercise any control over him or anybody else. Payment was always demanded for slate, however. The witness handed in a long list of buildings which he had erected from stone got from the Common, chiefly helm crag. During the construction of the Thirlmere aqueduct he frequently visited the work in this locality, and saw that the stone got was of no use whatever for building purposes.

Counsel for Lord Lonsdale (Mr. Page) asked witness whether he was aware that the practice of taking away and selling this stone was absolutely unknown to Lord Lonsdale.

The witness replied that he was not.

Mr. Page observed that they were obtaining some useful

information. It would appear that everybody had been allowed from all time to carve away at these rocks. It was a wonder there was any left.

Sir B. Baker, vice-president of the Institution of Civil Engineers, referred to the contention on behalf of Lord Lonsdale that a commercial value was given to the subsoil by the fact of the Corporation having to pass through it. If that principle were adopted in valuations for railways the result would be absolute chaos. In making a railway every yard of the stuff excavated would be used, and therefore a "commercial" value was given to the stuff, but in estimating that value they must consider whether under ordinary circumstances the stuff would have been likely to be wrought, the period over which its excavation would be extended and the evidence as to its value. If that were worked out the value would be found to be so infinitesimal as not to be worth talking about. It was a fallacy to hold that the Corporation gave a commercial value to the material.

If you were asked to estimate the value of this stone, would you have regard to the particular quantity used by the Corporation?—I should ask at what period the rock would probably have been quarried had I not gone there, and what the rock would be worth when quarried. In your view, has this stone in the hands of Lord Lonsdale any commercial value whatever?—Practically speaking none.

By Mr. Page: Is it not the fact that in thousands of instances mineral wayleaves for only short distances underground pay so much per ton for the mineral taken?—Very likely, because they follow the analogy of overground wayleaves. Assuming that to be the practice in a certain district, I suppose you would allow that that wayleave has a market value?—Yes, as you put it.

Answering further questions, the witness said he would allow a certain sum for any severance of Lord Lonsdale's property. He agreed that in case a railway company in making a cutting found stone for bridge-building, the fact would have to be taken into consideration, but he would consider also in estimating the value whether the stone would have been wrought had the railway company not gone there, and also its plenteousness or scarcity in the neighbourhood.

Mr. J. Smith, valuer, Bradford, estimated the total damage

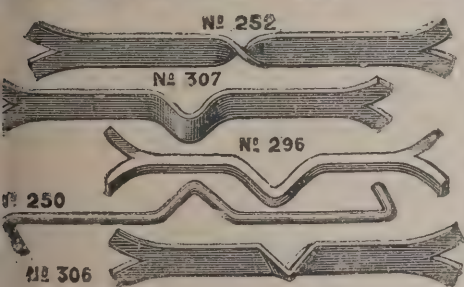
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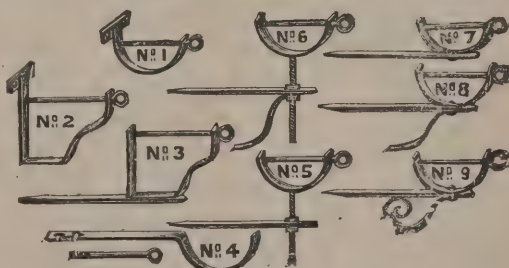
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done to Lord Lonsdale's interest on Grasmere Common, Spital Farm and Hutton Roof Farm at about 1,300*l.*, including 200*l.* as a nominal recognition of his rights as lord of the manor. He allowed nothing for stone taken out of the aqueduct.

Mr. Page: That is to say, you take away some 150,000 cubic yards of a man's property and allow nothing for it?

The witness replied that the stone was valueless.

Mr. J. Mansergh, civil engineer, agreed with previous witnesses for the Corporation that the stone excavated in making the tunnel had no marketable value, and that the fact that the Corporation used the stone for concrete was no ground for the present claim. If public bodies were to be burdened with such outrageous payments for a purely fanciful injury, a great impediment would be placed in the way of their schemes, and no engineer would be able to make trustworthy estimates of the cost of the undertakings. The introduction of the aqueduct created a theoretical rather than a tangible injury to the estate. He would allow 200*l.* as an acknowledgment of the manorial rights, and in respect of the works through Grasmere Common, Spital Farm and Hutton Roof he allowed rather less than 1,000*l.* If apart from the needs of the Corporation the owner could show that the stone had a practical value he should be compensated for it.

Mr. A. Hogarth, surveyor, Kendal, considered that 1,221*l.* would satisfy the whole of the claim.

Mr. G. Hill, the engineer of the Corporation, stated that the stone cost 30*s* a cubic yard in some places to excavate, and that therefore the presence of the stone, estimated by Lord Lonsdale's witnesses to be worth 1*s*. a yard, was a real drawback. Asked by Lord Lonsdale's counsel whether he had ever known a case in which a quarter of a million tons of material had been taken from a man without its being paid for, Mr. Hill replied that this stone had no value to Lord Lonsdale and that the claim was unprecedented.

Mr. Balfour Browne, Q.C., addressed the arbitrator at considerable length for the Corporation, arguing that until the Corporation went to Thirlmere and created a market for the stone the stone had no value, and would not have for perhaps thousands of years to come. The claim in respect of the stone was therefore an attempt to blackmail the Corporation. He pointed out that over "customary" lands the lord of the manor had no right to touch the minerals without the consent of the surface-owner, and that as to enfranchised lands, which constituted another large portion of the land in question, there was no evidence that the mineral rights were reserved to the lord.

Mr. Page, on behalf of Lord Lonsdale, replied in detail, and referring to Sir John Harwood's evidence as to the dangerous principles involved in the claim—as to the ability displayed in which evidence he paid a tribute—he characterised Sir John's fears as merely noble sentiments. It was undeniable that had not the Corporation had the advantage of the stone they must have procured the stone elsewhere, and have paid very well for it. It did not matter that the labour of the Corporation brought out the stone. He asked for no blackmail, but for the fair market value of that which Lord Lonsdale had lost and the Corporation had acquired. This was no new principle.

The arbitrator will present his award in due course.

PATENTS.

This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 20248. Frank Furness, for "Improvements in tiles for floors and other surfaces."
- 20273. Eliza Alice Abrams, for "Improvements in sash-locks."
- 20446. Samuel Hunt Rowley, for "Improvements in or relating to lavatories, sinks and other like sanitary appliances."
- 20450. Lewis William Shedden, for "Improved chimney and ventilating cowl."
- 20501. Ignacz Kaufmann, for "The sanitary protector."
- 20505. Henry William Butler, for "Improvements in the construction of fireproof dwellings."
- 20517. Frederick O'Conner Prince, for "Improvements in ventilators."
- 20535. Franz Wittman, for "Improvements in building material."
- 20554. George Newell Milward and Benjamin Nickling, for "Improvements in chimney-cowls."

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CONTRACTS OPEN.

ABERDARE.—Nov. 26.—For Building Thirty-three Houses. Mr. C. H. Elford, Architect, 34 Canon Street, Aberdare.

ABERDOVEY.—Dec. 6.—For Works of Sewerage and Water Supply. Mr. Morgan W. Davies, Engineer, 17 Adelaide Street, Swansea.

ANERLEY.—Dec. 1.—For Erection of Weather Screen at District School. Mr. H. J. Chaldecott, Clerk to Managers, North Surrey District School, Anerley.

ANERLEY.—Dec. 1.—For Making-up and Metalling about 200 Feet of Entrance Road at North Surrey District Schools. Mr. H. J. Chaldecott.

BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BARMOUTH.—For Esplanade and other Works. Mr. R. F. Anderson, Engineer, Ryde, Isle of Wight.

BECKENHAM.—Nov. 19.—For Store Yard for Sanitary Inspector. Mr. J. A. Angell, Surveyor, Local Board Offices, Beckenham.

BELFAST.—For Building Twenty-one Houses. Messrs. A. MacAlister & Son, Architects, 5 May Street, Belfast.

BELFAST.—Nov. 24.—For Extension of Covered Market and Building New Fish Market. The City Surveyor.

BLACKBURN.—For Building Co-operative Stores. Mr. F. H. Duarden, Architect, 68 Victoria Street, Blackburn.

BLACKWOOD.—For Taking-down Masons' Arms and Building New Hotel, Stables, &c. Mr. E. A. Lansdowne, Architect, Metropolitan Bank Chambers, Newport, Mon.

BRADFORD.—Nov. 17.—For Building Two Shops and Houses. Messrs. Walker & Collinson, Architects, 13 Piece Hall Yard, Bradford.

CARDIFF.—Nov. 21.—For Construction of Steps and Footway Approach between Adamsdown Square and Windsor Road. Mr. W. Harpur, Engineer, Cardiff.

CAVERSWALL.—Nov. 27.—For Enlarging Board Schools. Mr. T. P. Hulse, Architect, Longton, Staffs.

CHESTERFIELD.—Nov. 24.—For Building Pair of Semi-detached Villas. Mr. W. H. Wagstaff, Architect, 57 Saltergate, Chesterfield.

CHORLEY.—Nov. 20.—For Mechanical Appliances and Machinery for Sewage Disposal Works. Mr. W. Leigh, Borough Surveyor.

CITY OF LONDON.—Nov. 23.—For Construction of New Commissioners' Office in Basinghall Street. Mr. Henry Blake, Guildhall.

CROMER.—Nov. 23.—For Retiring Room to Court House at Police Station. Mr. T. H. B. Heslop, County Surveyor, Norwich.

DOWNPATRICK.—Nov. 24.—For Lavatories for Workhouse. Mr. J. W. Montgomery, Clerk, Poor Law Office, Downpatrick.

DRUXFORD.—Nov. 19.—For Bricklayer, Mason, Carpenter and Painter Work in Connection with Two Fire-escape Staircases at the Workhouse. Messrs. W. H. Mitchell, Son & Gutteridge, Architects, 9 Portland Street, Southampton.

EAST ASHFORD.—Dec. 1.—For Execution of Works of Drainage and Sewerage. Mr. Alfred J. Burrows, F.S.I., 41 Bank Street, Ashford.

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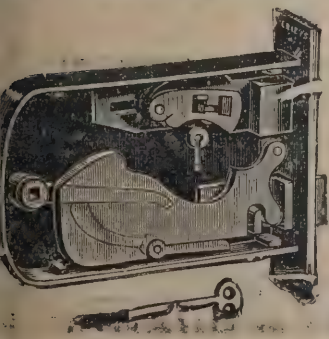
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FAREHAM.—Nov. 23.—For Tank and Tankhouse, Water Mains, Hydrants, Sluices, &c. Mr. Walter Butler, Surveyor to the Local Board, Fareham.

FARNBOROUGH.—Dec. 1.—For Building Police Station. Mr. James Robinson, County Surveyor, 13 Southgate Street, Winchester.

FILTON.—Nov. 22.—For Providing and Laying Water Mains. Mr. A. P. I. Cotterell, Engineer, 7 Baldwin Street, Bristol.

FIRTH OF CLYDE.—Dec. 6.—For Construction of Pier at Ardeer, Stevenston. Messrs. Crouch & Hogg, 175 Hope Street, Glasgow.

GLASGOW.—Nov. 22.—For Construction of Underground Conveniences. Mr. J. Lang, City Chambers, Glasgow.

GLASGOW.—Dec. 6.—For Supply of Granite and Whin Paving Stones, Crossings and Channels. Mr. Whyte, Master of Works, City Office, Glasgow.

GLASGOW.—Dec. 8.—For Works in Erection of Hospital for Infectious Diseases, Ruchill. The City Engineer, 64 Cochran Street, Glasgow.

HAMPSTEAD HEATH.—Nov. 21.—For Erection of a Public Urinal. Mr. H. de la Hooke, L.C.C. Offices, Spring Gardens, S.W.

HARROGATE.—Nov. 27.—For Building Retort House. Mr. George Sayner, Manager, Gasworks, Harrogate.

HIGH ONGAR.—Nov. 19.—School Buildings. Mr. Mawhood, Architect, 2 Market Road, Chelmsford.

KINGSTON.—Dec. 1.—For Boundary Walls and Oak Fence, &c., for Burial Board. Mr. E. Carter, Surveyor, 55 Clarence Street, Kingston-on-Thames.

KINGTON.—Dec. 7.—For Erection of Girls and Infants' Schools and Mistresses' Residences. Mr. J. E. Goodacre, Dunfield, Kington.

LEICESTER.—Nov. 26.—For Constructing Shelter at Recreation Grounds. Mr. E. G. Mawbey, Borough Surveyor.

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MANCHESTER.—For Erection of Christie Library Building at Owens College. Messrs. Alfred Waterhouse & Son, Architects, 20 New Cavendish Street, W.

MARTON.—Nov. 19.—For Building Workmen's Club. Mr. F. H. Gorst, Honorary Architect, 7 Birley Street, Blackpool.

MENSTON.—Nov. 23.—For Building Country House. Messrs. H. & E. Marten, Architects, 5 Charles Street, Bradford.

PENTRE.—Nov. 30.—For Building Infants' School. Mr. J. E. Lash, Architect, 5 Temple Row, Wrexham.

PORTREATH.—Nov. 24.—For Infants' School, &c. Mr. S. Hill, Architect, Redruth.

PWLLHELI.—Nov. 21.—For Vagrant Wards and Labour Yard and Additions to Guardians' Board-room. Messrs. Thomas Roberts & Son, Civil Engineers, Portmadoc.

QUEENSBURY.—Nov. 24.—For Building Local Board Offices, Surveyor's House, Stabling, Mortuary, Fire Brigade Station, &c. Mr. John Drake, Architect, Winterbank, Queensbury.

READING.—Nov. 19.—For Additions to Board School. Mr. S. Slingsby Stallwood, Architect, Market Place, Reading.

ROTHERHAM.—Nov. 20.—For Building Board Schools. Mr. H. L. Tacon, Architect, 11 Westgate, Rotherham.

RUABON.—Nov. 17.—For Building Policeman's House, Upper Ponkey. The County Surveyor, Denbigh.

SALFORD.—Nov. 19.—For Erection of School in Marlborough Road. Messrs. Woodhouse & Willoughby, Town Hall, Salford.

SCARBOROUGH.—Nov. 17.—For Cricket Pavilion. Messrs. Hall & Tugwell, Architects, Scarborough.

SELBY.—Nov. 19.—For Additions to School and Master's House, Cliffe. Mr. T. S. Ullathorne, Architect, Selby.

SKENE.—Nov. 21.—Alterations to House. Messrs. Jenkins & Marr, Architects, 16 Bridge Street, Aberdeen.

SPAIN.—Nov. 30.—For Construction of Dock (70,000/.) at San Stephen's, Provia. Plans, &c., at the Ministry, Madrid, and at Department of Public Works, Oviedo.

STAPLETON.—Nov. 22.—For Building Board School at the Causeway, Fishponds. Mr. W. V. Gough, Architect, 24 Bridge Street, Bristol.

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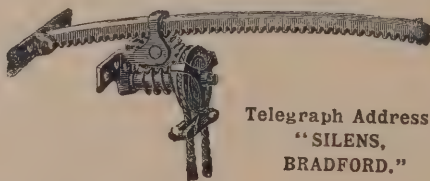
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SUNDERLAND.—Nov. 19.—For Building Board School. Mr. T. W. Bryars, 15 John Street, Sunderland.

SWINTON.—Nov. 22.—For Building Wesleyan Chapel and Schoolroom. Mr. Edward Taylor, Architect, 7 Stonegate, York.

THORNBOROUGH.—Dec. 3.—For Building Board School, &c. Messrs. George Bennett & Sons, Market Hill, Buckingham.

TREGONY.—Nov. 24.—For Restoring Boscawen Almshouses. Mr. Silvanus Trevel, Architect, Lemon Street, Truro.

WALTHAMSTOW.—Nov. 27.—For Erection of an Additional Classroom at Markhouse Road Boys' School. Mr. W. A. Longmore, F.R.I.B.A., 7 Great Alie Street, Whitechapel.

WARE.—Nov. 19.—For Additions and Alteration of Drainage, Workhouse. Messrs. Newman & Newman, Architects, 31 Tooley Street, London Bridge.

WEST MOORS.—Nov. 30.—For Building Curatage. Messrs. Adye & Adye, Architects, Town Hall Chambers, Bradford-on-Avon.

WINDERMERE.—For Parish-room. Mr. Robert Walker, Architect, Windermere.

WOLVERHAMPTON.—Nov. 30.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

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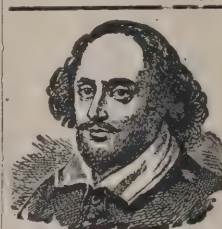
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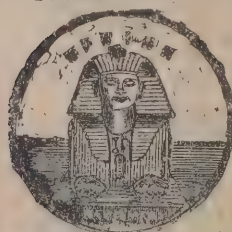
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E. Procter	2,845 0 0
H. L. Holloway	2,797 0 0

For Erection of a Public Hall and Workmen's Club at Bromells Road, Clapham. Mr. E. B. L'ANSON, Architect, 7A Laurence Pountney Hill, Cannon Street, E.C. Quantities by Mr. W. H. STRUDWICK, 14 Parliament Street, Westminster, S.W.

Charteris	£4,850 0 0
McLachlan	4,498 0 0
Triggs	4,390 0 0
Balaam Bros.	4,310 0 0
Rider & Son	4,240 0 0
Garrett & Son	4,092 0 0
Young & Lonsdale	4,081 0 0
J. Carmichael	4,030 0 0

ST. EWE.

For Infants' School at Lower Sticker, for the St. Ewe School Board.

F. Giles, St. Austell	£189 16 8
Bennett & Knight, St. Austell	179 10 0
J. COAD, Sticker (accepted)	170 10 0

PENARTH.

For Relaying Portion of 12-inch Pipe Sewer in Salop Street, for the Penarth Local Board. Mr. EDGAR I. EVANS, Surveyor.

Escott & Ford	£198 16 11
W. R. Thorne	154 0 11
T. Rees, Ely	151 17 0
F. Ashley, Cardiff	141 9 8
Gardner & Happerfield	140 4 6
Batchelor & Snowden, Cardiff	123 7 0
J. Jones	136 19 0
Barnes, Chaplin & Co, Treorky	123 4 2
E. H. Page, Cardiff	118 6 5
R. Smith	118 4 2
Turner Bros.	117 19 8
T. Taylor, Pontypridd	92 7 4
M. MEAZEY & SONS (accepted)	98 13 7

For Private Improvement Works, Archer Road, for the Penarth Local Board. Mr. EDGAR I. EVANS, Surveyor.

Gardner & Happerfield, Penarth	£1,034 11 11
T. Rees, Ely	907 1 0
F. Ashley, Cardiff	885 3 6
J. Jones, Penarth	863 1 9
T. Taylor, Pontypridd	824 5 5
R. Smith, Cardiff	822 18 10
Barnes, Chaplin & Co., Treorky	782 8 10
T. Rees, Merthyr Vale	782 0 7
E. H. Page, Cardiff	779 9 4
ESCOTT & FORD, Penarth (accepted)	767 13 0

PORT TALBOT.

For Supply and Laying 1,200 Yards of 6-inch Cast-iron Water-main at Port Talbot, with the Necessary Valves, &c., for the Margam Local Board. Mr. ROBERT LEIGH, Surveyor, Taibach, Port Talbot.

C. & F. Gaen, Port Talbot	£652 17 6
J. Davies, Aberavon	429 10 5
J. Williams, Swansea	429 6 0
Barnes, Chaplin & Co., Cardiff	407 4 9
J. Allan, Cardiff	381 16 9
Clark & Balmer, Port Talbot	367 1 4
BATCHELOR & SNOWDEN, Cardiff (accepted)	333 18 9

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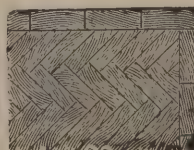
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147 STRAND, LONDON, W.C.

PARKSTONE.

For Laying Stoneware Storm-water Drain, &c., at Parkstone; Making-up Road from the Ferry Steps to near the Battery, Hamworthy, for the Poole Town Council. Mr. J. ELFORD, Borough Surveyor.

Contract No. 1.

Burt & Vick, Poole	£294	10	0
T. G. Budden, Newtown, Poole	277	0	0
S. Saunders, Bournemouth	266	0	0
Saunders & Newton, Bournemouth	252	0	0
H. C. Brixey, Newtown	232	0	0
T. C. RIGLER, Longfleet, Poole (accepted)	228	0	0
J. Guy, Newtown	217	10	0
Surveyor's estimate	230	0	0

Contract No. 2.

H. C. Brixey	230	11	9
Saunders & Co.	214	0	0
T. G. Budden	167	0	0
T. C. RIGLER (accepted)	130	0	0

PLYMOUTH.

For Street Improvement Works, for the Corporation. Mr. JAMES PATON, Borough Surveyor.

Egerton Road Lane.

Paynter & Davey	£446	11	6
E. Duke	445	1	6
Parsons & Sons	4	6	9
Wakeham Bros.	388	13	11
T. SHADDOCK (accepted)	383	12	4

Lifton Villas Lane.

Paynter & Davey	67	17	6
Parsons & Sons	67	10	0
E. Duke	64	16	0
T. Shaddock	60	13	3
WAKEHAM BROS. (accepted)	58	10	0

Greenbank Avenue, Extension Lane East.

Paynter & Davey	317	1	6
Parsons & Sons	240	16	9
E. Duke	232	1	6
Wakeham Bros.	201	14	4
T. SHADDOCK (accepted)	200	13	6

PLYMOUTH—continued.*Knighton Road Lane.*

Paynter & Davey	£220	11	6
Parsons & Sons	208	5	6
Wakeham Bros.	190	8	0
E. Duke	188	17	10
T. SHADDOCK (accepted)	188	1	2

Thistle Park Lane.

E. Duke	227	9	6
Parsons & Sons	151	6	0
Wakeham Bros.	148	14	8
T. SHADDOCK (accepted)	141	17	2
Paynter & Davey (withdrawn)	67	17	0

Bishop's Place.

Paynter & Davey	485	12	6
E. Duke	441	11	6
Wakeham Bros.	441	11	6
T. SHADDOCK (accepted)	398	2	0
Parsons & Sons (withdrawn)	251	11	6

RYDE.

For Terra-cotta Billiard-room, Woodlands Vale, near Ryde, for General the Hon. Somerset J. G. Calthorpe. Mr. STEPHEN SALTER, jun., Architect, Pondwell, near Ryde, and Maidenhead.

I. BARTON, Ryde (accepted) £690 0 0

For Building Head Gardener's Cottage, Cherrygin, near Ryde, for General the Hon. Somerset J. G. Calthorpe. Mr. STEPHEN SALTER, jun., Architect, Isle of Wight, and Maidenhead.

C. Landon	£535	0	0
E. James	516	0	0

TYLORSTOWN.

For Erection of a Church close to Tylorstown Station, near Pontypridd, to Seat 300 Persons. Mr. GEORGE E. HALLIDAY, Architect, 14 High Street, Cardiff.

Richards, Pontypridd	£3,012	10	0
Davies & Son, Treherbert	2,665	12	1
Williams, Knighton	2,600	0	0
Williams & James, Pontypridd	2,596	16	6
Hatherley & Carr, Bristol	2,587	0	0
Jenkins & Son, Porth	2,550	0	0
Williams, Narberth	2,344	0	0
HAINES, Cardiff (accepted)	2,295	0	0



BEST PORTLAND CEMENT

"ADAMANT BRAND." Manufactured by

SKELSEY'S ADAMANT CEMENT Co. LD

HEAD OFFICES: 121 HIGH STREET, HULL. WORKS: STONEFERRY, HULL, & BARTON-ON-HUMBER

Output 700 tons weekly.

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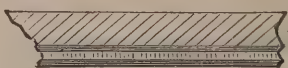
OFFICES—
22 QUEEN'S RD.,
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Parquet Floor,
Joinery and
Wood Carving
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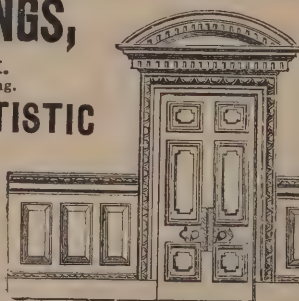
One inch and $\frac{1}{4}$ -inch thick.
Immense Stock always ready for Laying.



Turpin's Patent.
5-16 inch thick, laid in Patent Composition on Concrete, Stone, and Deal Floors. (See Section.)



ARTISTIC



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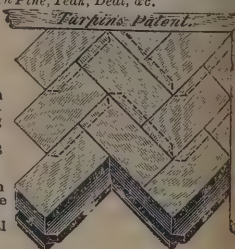
MARBLE

MOSAIC

PAVING.

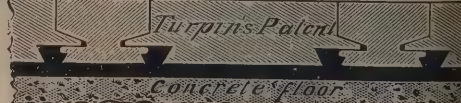
OAK BLOCK FLOORINGS

One inch thick, from 4s. 10d. per yard super.
Also in Pitch Pine, Teak, Deal, &c.



System of Preparing for Laying such Block Floor on Concrete Stone, and Deal Floors.

Section of wood block floors—



COUNTRY HOUSE
INSTALLATIONS A
SPECIALITY

SAM'L CUTLER & SONS

COMPLETE
EXPORT
PLANTS

ELECTRIC

LIGHTING

ELECTRIC
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WINDING &
TRACTION WORK.

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WESTMINSTER

LONDON.

PROVIDENCE WORKS
MILLWALL.

PUBLIC
BUILDINGS
THEATRES, ETC.

STOURBRIDGE.

For Contract No. 3, Erection of Engine-house and Stores, the Construction of Tanks, Filters, Carriers, Drains, Roads, Ejector Stations, Cast-iron Delivery Mains and other Works required in Connection with the Laying-out of Outfall Sewage Disposal Works at Tividale, near Dudley, for the Upper Stour Valley Main Sewerage Board. Messrs. E. B. MARTEN & W. FIDIAN, Joint Engineers, Church Street Chambers, Stourbridge.

G. Bell, Tottenham	£3,283	0	0
Jones & Fitzmaurice, Birmingham	2,942	0	0
G. Law, Kidderminster	2,900	0	0
G. Trentham, Handsworth	2,885	0	0
H. Holloway, Wolverhampton	2,875	18	6
H. Dorse & Son, Cradley	2,750	15	5
T. Vale, Stourport	2,748	11	0
J. Mackay, Hereford	2,630	11	1
J. Guest, Stourbridge	2,480	0	0
J. BIGGS, Birmingham (accepted)	2,361	6	4

TRADE NOTES.

THE Rowley School Board have accepted the tender of Messrs. Cockin & Sons, of Blackheath, Rowley, for the works of alteration at Cradley Heath Infants' School, at a cost of 1,218*l*.

A NEW eight-day illuminated turret-clock has just been erected at the Grand Hotel, Ashington, by Messrs. W. Potts & Sons, of Leeds and Newcastle-on-Tyne, from instructions received from Mr. Benjamin Simpson, architect, Grey Street, Newcastle. Messrs. Potts have also in hand a new Cambridge quarter-clock with four external dials for St. Cuthbert's Church, Crook, West Durham.

THE Climax direct-acting turret ventilator Company's design having been selected by the architect, Mr. George Simpson, for the ventilation of the Leith Infectious Diseases Hospital, now in course of erection, Messrs. Cousland & Mackay, ventilating engineers, of London and Glasgow, who are the manufacturers of these ventilators, are now supplying a large number for this purpose.

THE Pershore Rural Sanitary Authority have accepted the tender of Mr. H. Lane, of Wolverhampton, for works of water-supply at Wyre and Bishampton at a cost of 730*l*.

At a recent meeting of the Glasgow Police Board, the inspector of lighting submitted a report on the ten incandescent lamps which were fitted up in St. Vincent Street, between Buchanan Street and Renfield Street. The report stated that the first was put up on May 8 last, and the others in the beginning of July. Five of the lamps consumed 5 cubic feet per hour, and five 3½ cubic feet. It was found that the mantles on the 5-foot burners were not so durable as the others, and the burners were changed, so that all the lamps are now consuming 3½ cubic feet per hour, the annual cost for ten lamps being 17*l*. 3*s*. 3*d*. The cost for gas before the burners were changed was 39*l*. 13*s*. 10*d*.; difference in cost per gas, 27*l*. 10*s*. 7*d*.; the cost for the burners is 11*l*. 5*s*.; difference on the first year, 11*l*. 5*s*. 7*d*. In addition there is the cost of renewing defective mantles. During the course of this experiment four required to be replaced at a cost of 6*s*. 4*d*. So far as the light is concerned, it may be taken that the gas consumed in the incandescent lamp yields four times the quantity that the ordinary flat-flamed burner does. The committee directed the inspector to extend into Gordon Street and into George Street eastwards to High Street the experiment of lighting these streets by means of incandescent lamps. Bailie Primrose, in moving the adoption of the minutes, said the committee had every confidence that incandescent gas-lighting would play an important part in the future lighting of the city. The minutes were approved.

THE new schools for the Barrow-in-Furness School Board are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE have received from Mr. John Spencer, Globe Tube Works, Wednesbury, a very convenient aluminium scale which he has just brought out for gauging the sizes and weights of his tubes, and which is graduated for metres and for inches. It is a handy little article for carrying in the waistcoat pocket.

A NEW style of envelope has just been brought out by Beechings Limited, of 174 Strand and 45 Upper Baker Street. It has been specially designed for use with any form of type-writer, and it affords the best possible surface for type-writing the address, "shadowing" being avoided and the writing correctly aligned.

THE Swindon Local Board have decided to apply for a provisional order for electric lighting of the town.

BANK AND OFFICE INTERIORS.

SPECIALTIES:

PANELLING, COUNTERS, DESKS AND STRONG-ROOM FITTINGS. MANUFACTURED ENTIRELY AT OUR LONDON CABINET WORKS.

ARCHITECTS INVITED TO APPLY FOR OUR TENDERS.

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SUMMER
DRIED
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STONE
FOR
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QUARRIES.
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MAHOGANY, TIMBER AND VENEER MERCHANT, MOULDING MANUFACTURER.
HARD AND SOFT WOOD MOULDINGS, FLOORING IN OAK AND TEAK.
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SPECIAL LINES IN OAK FLOORING.

Moulding Mills, Timber Yard and Stockyard:—124 CURTAIN ROAD, LONDON.

TELEPHONE 804.

BUILDING AND BUILDERS.

THE Birmingham City Council have adopted the recommendation of the markets and fairs committee to have the altered plans for the new meat market and slaughterhouses carried out at an additional cost of 5,000/.

THE Mersey Docks Board at their last meeting approved plans for the erection of new lairages at Seacombe to deal with the foreign cattle trade. The estimated cost is 400,000/.

THE Chester-le-Street Board of Guardians have instructed Mr. Cowe to prepare plans for the erection of a new infirmary on the workhouse grounds and for a new board-room and offices.

PLANS by Mr. Meredith, architect, for new Board schools at Tump Road, Blackheath, Rowley, have been approved by the Rowley School Board.

ELECTRICAL.

THE electric-lighting works established at Crowlands by the Southport Corporation have been opened, the cost having been 13,000/. The installation is equal to 6,200 8 candle-power lamps, and applications have been already sent in for 4,700 lamps. An alternating current will reach the lighting area at a pressure of 2,000 volts, and there will be six transformer substations for the convenience of the public buildings, shops and houses which take the supply.

IT is proposed to introduce the electric light into Paisley. The provisional order obtained by the Council is apparently to be transferred to a Caledonian Company.

AT Milngavie, N.B., the electric light has been inaugurated. The power is obtained from a turbine wheel which is driven by water from the river Allander.

VARIETIES.

THE Barnsley Town Council propose to apply to Parliament for power to extend their water supply, a scheme of which has been prepared by Mr. Charles Hawksley, engineer. The borough surveyor, Mr. J. H. Taylor, has prepared a report on the scheme, in which he estimates the cost as follows:—Cost of works, 146,000/.; Parliamentary expenses, 10,000/.; interest on outlay during construction of works, 10,590/.; extras

3,050/.—170,000/. The site is the same as that once chosen by Wakefield, whose attempt was defeated by Sheffield opposition, and it is expected that there will be great opposition in this case also.

IT is intended to construct a pier about 700 yards in length at Ardeer, near Stevenston, on the Ayrshire coast, from designs by Messrs. Crouch & Hogg, C.E., Glasgow. It will be a private pier solely for the convenience of Nobel's Explosives Company and will be carried out into the sea a long way below low-water mark, so that their fleet of steamers may load at all states of the tide.

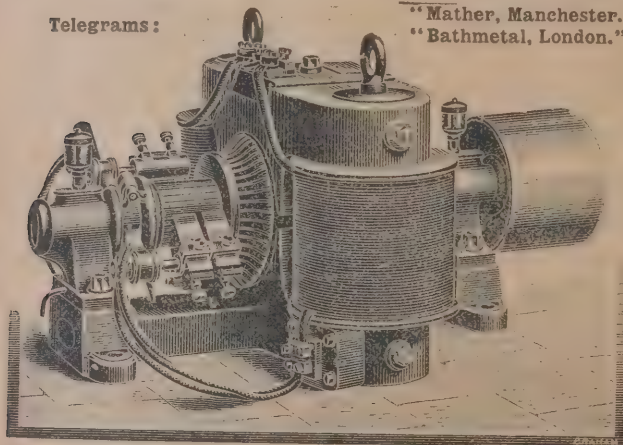
IT is proposed to retain the convicts at Dover. The Board of Trade have been losing the foreshore between Dover and St. Margaret's Bay owing to the encroachment of the sea, and the lighthouses and other buildings on the cliff are likely to become endangered. It is proposed to let the cliffs be escarped by the convicts and that the town find paid labour to reclaim about 300 feet of land under the whole three miles of cliff.

ARTISANS' DWELLINGS IN MARYLEBONE.

By the conditions of their Act for the extension to London, the Manchester, Sheffield and Lincolnshire Railway Company are under statutory obligation to provide for the 2,910 workpeople who will be displaced. It is proposed to erect six blocks of artisans' dwellings in the neighbourhood of Cunningham Place and St. John's Wood Road, each block having six floors, and the whole accommodating 3,200 persons. The Marylebone vestry, having regard to the amenities of the locality, to the comfort of the working-classes themselves, and to the fact that other similar house accommodation will be provided hard by, suggest that five floors for each block would be ample and desirable. By the new Building Act, which will come into operation on Jan. 1 next, this will be the maximum height allowed. At the last vestry meeting a hope was expressed that means might be found for preventing the railway company from anticipating this Act by a few weeks and building workmen's dwellings of an elevation which on hygienic grounds was now disapproved. The works committee were instructed to seek a conference with the Building Acts committee of the London County Council with a view if possible of preventing the erection of the blocks as planned. It was intimated that the scheme for rehousing the people displaced would ultimately have to be sanctioned by the Home Secretary.

Telegrams:

"Mather, Manchester."
"Bathmetal, London."



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"MANCHESTER" DYNAMO.

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Complete Installations for Central Lighting Stations.

Also for Public Buildings, Mills, Workshops, Mines, &c., including Steam Boilers, High-speed Engines with Automatic Expansion Gear, Dynamos and Fittings of Improved Design.

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October 1894

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SEVEN GOLD MEDALS

In all, with Highest Honours on every occasion.

MALE OPERATORS OF YOST MACHINE IN GREAT DEMAND.

INSTRUCTION on the YOST is given at the Company's Depôts, and at Exeter Hall, Strand, London.

THE YOST TYPEWRITER COMPANY, LIMITED,
40 HOLBORN VIADUCT, LONDON, E.C.**BRANCH ADDRESSES:**

MANCHESTER—3 Deansgate.
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LIVERPOOL—22a North John Street.

GLASGOW—112 St. Vincent Street.
BELFAST—9 Rosemary Street.

LEEDS—21 New Station Street.
PARIS—38 Boulevard des Italiens.



Trade Mark (Regd.)

THE "OTIS" ELEVATORS.

THE "Otis" Elevator Co. write as follows :—It may be of interest to your readers to know that the large hotel now nearing completion on the Salisbury Estate, Strand, will be supplied with eleven "Otis" hydraulic elevators, seven of which will be for passenger use. This hotel will therefore have a better elevator equipment than any other hotel building in Great Britain or Europe. Among other contracts recently taken by this company for hydraulic elevators is one for the large business premises of Messrs. Charles Jenner & Co., Princes Street, Edinburgh, where we are erecting six hydraulic elevators ; 9 St. Mildred's Court, E.C., one hydraulic elevator ; Lord Vernon's mansion, Sudbury Hall, Derby, one hydraulic passenger elevator.

We are now erecting in St. Petersburg two hydraulic passenger and one electric passenger elevator ; in Moscow, one hydraulic passenger elevator, and have just shipped two elevators, with pumping plant, &c., complete, to the Nippon Yusen Kaisha Building, Tokio, Japan. The following are some of the many cases where electric passenger elevators are now being erected :—Gordon Mansions, Middle Class Dwellings Company, Limited, London, 2 ; Madame de Monbel, 132 Avenue Wagram, Paris, 1 ; Madame de Monbel, 24 Rue Ampere, Paris, 1 ; M. Pichot, 54 Rue de Clichy, Paris, 1 ; Hôtel de Calais, Paris, 1 ; Baroness Zuylen, Paris, 1 ; M. Schultz, Spandaterstrasse 16-17, Berlin, 1 ; Mr. H. von Derwis, St. Petersburg, 1 ; Graham Brothers, Stockholm, 1.

A MEETING has been held of the Aberdeen Harbour Commissioners, at which it was resolved that in view of the diverse opinions expressed by Mr. Wake, C.E., and Mr. Cunningham, Dundee, as to the pontoon bridge and its suitability for the harbour, and looking to the great economy in the adoption of such a bridge as against a swing one, the Board remit the matter back to the works committee to get the opinion of a qualified engineer on the whole subject and report to the Board. Lord Provost Stewart advised that before the Board resolved to spend the 45,000*l.* which the minutes authorised, they should take a little longer time to consider the position, because they were planning the docks for the next generation.

TESTING AIR IN AMERICAN SCHOOLS.

ACCORDING to the *Boston Journal of Commerce* great care is taken by the Massachusetts State inspectors of public buildings when testing the means of ventilation in a school house to secure all the data for an accurate and intelligent report. The barometric pressure, temperature and relative humidity of the outside air are first taken, together with the force and direction of the wind. The location of the building as to points of the compass, the position and direction of the fresh-air ducts and position of the inlets and outlets in the rooms are also noted. Upon entering the room to be examined thermometers are placed in various positions, on the inlets and outlets, at the teacher's desk, at the breathing line and floor among the pupils and near the outer door.

Careful measurements are then made of the volume of air supplied to and removed from the room by the ventilating apparatus. These measurements are made by taking the velocity in feet per minute of the air at the inlet or outlet by a standard anemometer and then multiplying this velocity by the average working area of the opening in square feet. For example :—The inlets and outlets are usually covered by wire gratings or by ordinary register facings, which obstruct to some extent the flow of air, and it is seldom the case that the air is found to be flowing alike through all parts of the opening. Proper corrections being made for these variations and for the running of the anemometer, a very close approximation to the actual volume of air passing through may be obtained. After keeping the doors and windows of the room closed for one hour, a test is made to ascertain the amount of carbonic acid in the air, the amount of this gas present being considered as a fair index of the other and more dangerous impurities in the air of the schoolroom. This test, unless great accuracy is desired, is usually made with an instrument invented by Professor Wolpert and called, from him, a Wolpert air-tester. This instrument is very simple, consisting only of a glass test-tube, on the bottom of which is a black mark, an inner tube of glass and a rubber bulb, all of a specified size, and a stand in which to hold the tube. The test-tube is filled to a certain height—marked on the tube—with lime water, and by means of the inner tube and bulb air from the room is passed through the water until, by the formation in it of carbonate of lime, the water is rendered so opaque that the black mark or spot cannot be seen. A table, furnished by the inventor, shows by the

THE INCANDESCENT GAS LIGHT

(WELSBACH SYSTEM).

One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of 3½ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows :—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.
ARGAND " 44 " " " " "

SIEMENS' BURNERS, 23 calories per candle per hour.
WELSBACH " 10 " " " " "

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS LIGHT CO., LIM.,
14 Palmer Street, Westminster, London.

number of times the bulb has been filled how many parts of carbonic there are in 10,000 parts of air.

There are various sources of error, both in the measurement of the volume of air and determining the amount of carbonic acid, which have to be carefully guarded against by the inspector. This has been so well done in testing the air that in a large number of tests made with a Wolpert tester at the same time that samples of air were taken for chemical analysis, the average difference between the amount given by analysis and by the Wolpert test was only 67-100ths of one part in 10,000.

Tests to show the circulation of the air through the room are also made, usually by means of gunpowder smoke.

The report of the inspector, when complete, gives, in addition to the outside conditions already noted, the volume and temperature of air supplied and removed, the temperature of the room, the relative humidity of the air, the amount of carbonic acid found in it, and the results of the tests for circulation.

For determining the barometric pressure, relative humidity and temperature, and also for measuring the flow of air into and out of the room, the very best and most accurate instruments to be procured are furnished to the inspectors by the State.

These gentlemen by long practice and habits of close observation have become very expert in the use of the apparatus employed in testing air supplies to school houses and other buildings, and they are also equally expert in regard to methods and systems of heating and ventilation, their wide experience placing their knowledge and judgment in such matters far above those of men of limited experience in such matters, or mere theorists.

SEWAGE EFFLUENTS IN LANCASHIRE.

At the last meeting of the Mersey and Irwell joint committee Sir Henry Roscoe exhibited diagrams showing the results of the tests applied to sewage effluents in Lancashire. It was found that the county boroughs, with the exception of Rochdale, were in an unsatisfactory position. The population of the seven county boroughs was 1,148,699, and the sewage from 43 per cent. of this population flowed untreated into the rivers at the present time. Manchester was treating by chemical precipitation the sewage from a population of 269,865, but the effluent from the chemical treatment alone could not be con-

sidered satisfactory. Bolton, with a population of 115,000, was turning out a most unsatisfactory effluent, and Salford, with a population of 198,000, was in a similar position. Rochdale, on the other hand, with a population of 71,400, was treating its sewage efficiently. Bury, Oldham and Stockport had not yet sewage works in operation. Of the eleven non-county boroughs, representing a population of 294,277, Hyde, with a population of 30,670, was the only one in which a sewage treatment was at work, and this was a satisfactory result. With regard to fifty-six urban sanitary authorities, representing a population of 608,259, twenty-seven with a population of 261,134 had no sewage works in operation; twenty-two had sewage works, and, generally speaking, turned out satisfactory effluents from a population of 230,756, and seven had sewage works turning out unsatisfactory effluents from a population of 116,369. In other words, the sewage from 43 per cent. of the 608,259 population flowed untreated into the rivers; 38 per cent. was satisfactorily treated, and 19 per cent. unsatisfactorily treated. With reference to rural sanitary authorities, the results from twelve sewage works, with one exception, were fairly satisfactory. Whilst he had considered it his duty to point out to the committee the exact position at the present moment in regard to the sewage effluents, yet the proceedings of the committee showed that great progress was being made for the completion of sewage works, and that those authorities whose works were shown to be unsatisfactory were being compelled by the committee to take the necessary steps to insure satisfactory results.

INSTITUTION OF CIVIL ENGINEERS.

THE opening meeting of the session of this Institution was held on Tuesday evening in the hall in Great George Street, Westminster. Sir Robert Rawlinson, K.C.B., the president, in the course of his inaugural address dealing with the history and progress of civil engineering, said that of all the branches of civil engineering, no more remarkable progress had been made during the last half-century in any one department than in that which was concerned with the health and well-being of mankind. Sanitary science was in a sense as old as civilisation, but it might puzzle a lexicographer to give a satisfactory definition of it. Some learned professor might define physical science and force, but sanitary engineering he might reasonably say was not a science. Sanitary science did

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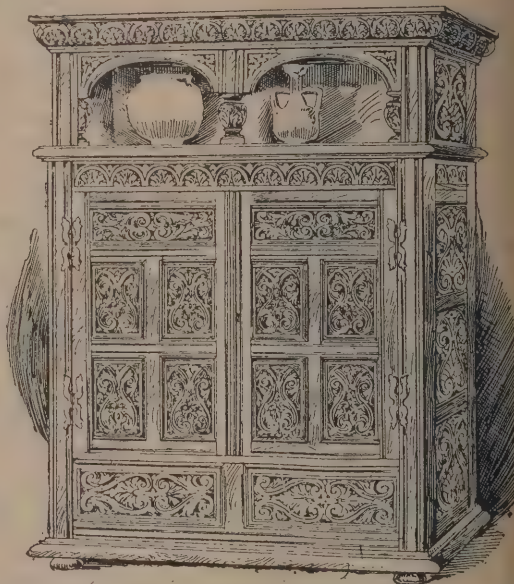
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not necessarily meddle with medicine, nor with surgery, but based its results on scavenging, town sewerage, house draining, and on insisting upon all means for domestic and personal cleanliness.

Among the principal of the improvements brought about by the progress of sanitary science, after main sewerage, house draining, water supply and scavenging, had been the establishment of public baths, washhouses and disinfecting apparatus. Some of these establishments had, however, been too grand and costly, and also placed too remote from the poor, and had consequently been failures. Washhouses and baths for the poor should be situated in the heart of poor districts; their management should be economical, their charges the lowest, and the disinfection of bedding and clothing should be done gratuitously. Any bedding or clothing requiring to be burned should be replaced without charge to the poor afflicted sufferers, this being a charitable act and the truest economy for the ratepayers. Punish a family for having disease, and they would shrink from you; treat them kindly and sympathetically and the poor would respect you. It had become usual to credit sanitary works, such as sewerage, drainage and improved supplies of water, with the observed reduction of deaths in the district, and he was not inclined to repudiate this. But he also saw other powerful influences at work on this great and most interesting problem, namely, education, increase of temperance amongst all classes, better wages to the artisan workers, shorter hours of labour, cheaper food, cheaper clothing and a widespread sympathy of class with class. There was no problem of sanitary engineering of vaster range than that presented by the great Metropolis. At present the streets of London were crowded to a dangerous excess with sewers, drains, waterpipes, gaspipes, telegraph and pneumatic tubes, electric-lighting cables and hydraulic-pressure mains. No city in this world of which there was any history was ever sewered on so great a scale as London now was, and yet the main low-level sewers were too small to relieve the area bordering the river. It had at times occurred to him that deep tunnel sewers in lines irrespective of those of the streets above might be found necessary to relieve the streets. In Paris there were such large underground tunnels for sewers, gaspipes, waterpipes, and telegraph tubes and wires.

The sewage of London, now wasted at great cost to the ratepayers, might be taken to the Maplin sands, if these were embanked for the purpose, and on its way be delivered in dressings of liquid sewage over the poor adjoining lands, which

would add tenfold to their productiveness and provide useful employment for casuals clamouring at the doors of charity and crying out for work every winter. A question of vital importance was that of the present and the future water supply to the ever-increasing millions who lived and worked in London. The supply of water to London was still derived mainly from open rivers, the Thames and the Lea. The important questions were:—Must these sources be continued? Must the interests of the water companies be bought? And then, must there then be consolidation of management? If so, under the London County Council, or by a special water trust, similar to the case of the docks at Liverpool and other large trusts? When consolidation had been accomplished, should the rivers be continued as the main sources of supply for domestic purposes, or should new sources be obtained? These were wide questions and would be very costly questions. They, however, required to be answered. What were the advantages of open river supplies of water for domestic purposes, if any? Open river water might be termed "living water," as in both the Thames and the Lea the sources might be termed pure, remembering that nature did not deal in or provide pure water for any purpose. The waters of the Thames and Lea might be termed "living," as they were in unceasing motion from their sources, and the strata in both cases were geologically favourable to the supply of "sweet" water. The Conservators of the Thames had, however, allowed the abomination of house-boats to occupy the water and the banks of the river. The powers of the Conservators had hitherto been insufficient to compel some towns and villages to abstain from polluting the river which provided London with water. But must all these abuses continue? Or was there some sort of explanation for their prolonged existence? The sources of both the Thames and the Lea were as pure or as free from objection as it would be possible to find water. The waters were hard—that was, they contained about 16 grains of bicarbonate of lime in each gallon, which might be partially precipitated by boiling. These waters did not act on lead. The works were owned and managed by companies. Consolidation and purchase seemed practicable, and then any necessary extensions could be made. To bring in rival companies and to attempt to lay additional mains in the already choked streets of London would be impossible. To bring in soft water from long distances would be costly. Additional supplies of water for London might be obtained in or near the areas through which the Thames and the New River flowed.

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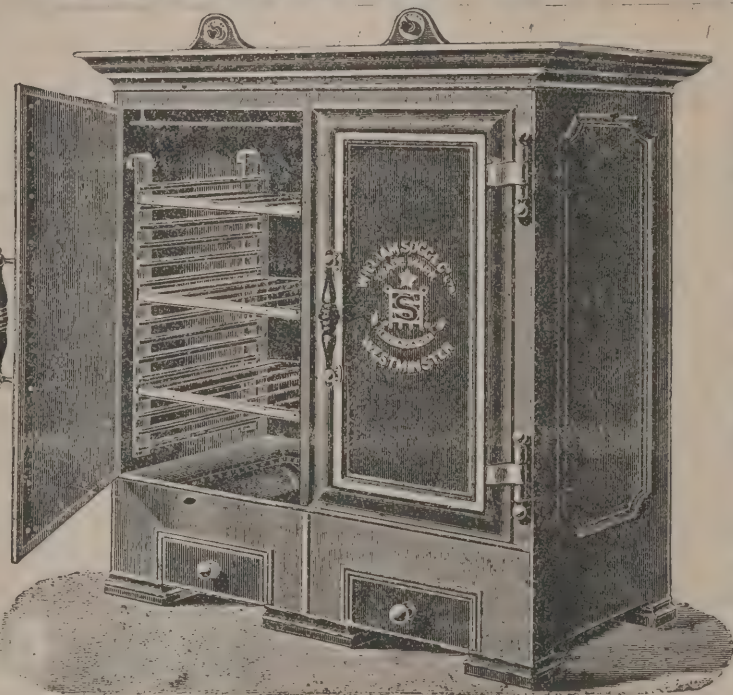
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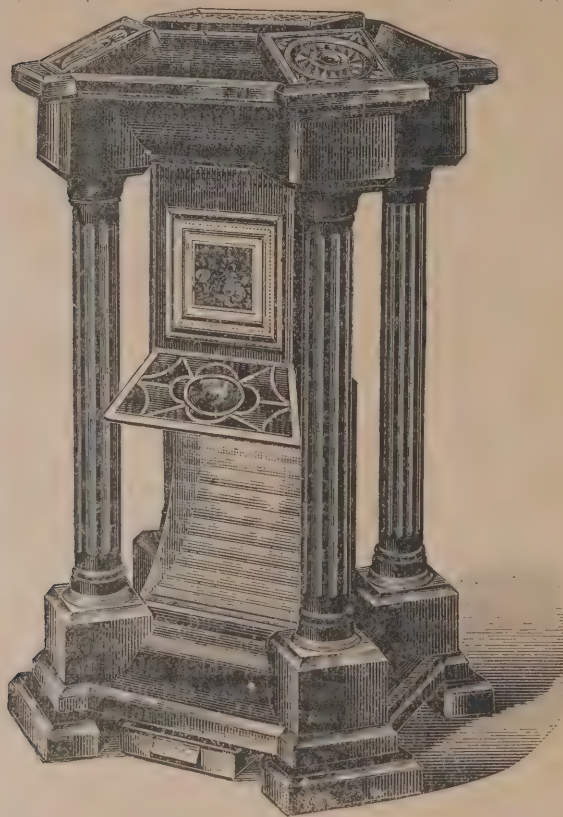
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SUNRAY CONDENSING STOVE.

WE have received from the Maughan's Patent Geyser Company the following particulars of their excellent new patent Sunray condensing stove, No. 5, for warming halls, chapels, schoolrooms, large rooms, offices, shops, staircases, public



buildings, &c. While it requires no flue, there is no smoke or smell, no dirt or trouble and it can be used either for gas or oil. It is described as a very powerful stove, designed for

warming large spaces, and it is claimed that it is undoubtedly the only gas stove which can be economically employed for this purpose, as it avoids the waste of heat which is inseparable from the use of a flue or chimney. The whole of the heat produced being utilised, it, at a cost of $\frac{3}{4}$ d. per hour for gas, will give as much heat as a radiator or furnace of the same size, and when the trouble and expense of attending to these is considered, the advantage of the patent Sunray stove is obvious. The directly radiated heat alone (from the deflecting plate and reflector) is equal to that of a bright coal fire, while the whole of the stove becomes heated and a large quantity of hot air is discharged from the top. All parts liable to rust are made of cast-iron or copper and the stove is finished throughout in the best style. The decoration can be arranged to suit any situation. It is made in two qualities—(1) Ornamentally japanned, with inlaid tiles, stained-glass, &c., as shown in engraving. (2) For situations where appearance is not a consideration, japanned in plain colours and without stained-glass and tiles.

We may sum up by saying that the special features of the Sunray, as compared with other condensing stoves, are the downward radiation of heat, warming the lower part of the room, the absence of glass or metal chimneys, the cheerful appearance when alight, and the superior finish.

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SOCIETY OF ARCHITECTS.

THE first ordinary meeting of this Society for the session was held on Tuesday evening at St. James's Hall. Mr. E. J. Hamilton, the president, was chairman. Messrs. F. C. Cuadall, F. C. Gant, W. C. Humphrey, J. H. James, V. Mitchell and A. F. Wrightson were elected as members.

The President delivered his inaugural address. He said :— In entering upon the duties of President of the Society of Architects I know not whether the sense—a very real one—of the high honour which you have conferred upon me, or the consciousness of its weighty responsibilities be the greater. This responsibility tends, of course, to increase as the position and influence of our Society grows and the scope of its operations is widened.

Permit me to say at the outset that, conscious as I am of their inadequacy, such powers as I possess shall be freely devoted to the interests of the Society. My aim will be not only to maintain, but to raise by all legitimate means the status of the Society, and also to increase the practical usefulness of its undertakings. In this endeavour I am assured that I may confidently depend upon the valuable support of the Council and officers.

In looking over the names of the men who have occupied this chair—most of whom it has been my pleasure to know—to whose untiring energies and signal abilities the Society owes much, it is, perhaps, not a little significant that four out of the six have been architects engaged more or less in practice in the provinces. Now this fact emphasises a feature of the Society's work which it is, to my mind, of great importance to keep well to the front, namely, the extension of the benefits of the Society by all practical means to architects living at a distance from London.

Far be it from my purpose to offer any discourtesy to London members, from many of whom upon the Council I have personally experienced much kindness. But I think it will be fully granted that to architects practising in London and to students residing here, there come many advantages of a social and educational kind to which men in the provinces—often much isolated from their professional *confrères*—are strangers, and to such the bond of union afforded by our Society cannot be made too real.

The report which has just been issued by your Council mentions two useful extensions of our operations, both in the direction to which I have referred.

The improved character which the Journal of the Society has during the past year assumed, both in literary excellence and style of production, is a matter for congratulation, and I would very heartily endorse the words of thanks to the editor appearing in the report. The report also encourages us to look for still further enlargement and improvement, and here again I would venture to emphasise the urgent request of the Council for the hearty co-operation of members. If a thoroughly good journal be of special advantage to provincial and colonial members—and undoubtedly it is—it is also just that feature of the work in which such members may render very substantial help by a free interchange of thought and information.

The other matter to which I allude is the visits of the hon. secretary and the secretary, by direction of the Council, to members in various provincial towns. Such friendly visits cannot fail, I think, to be of advantage, both to the members visited and to the Society. I sincerely trust, moreover, that it may be found practicable to carry out the contemplated holding of meetings in large provincial centres. To the members residing in these districts we must look to create the interest, and even enthusiasm, essential to the success of such gatherings; but, if well organised and heartily taken up, such meetings would not only be helpful to our membership, but would doubtless do much to promote an education of the public mind on the important subject of the compulsory examination and registration of architects.

The papers read during the past year have made a valuable addition to the series, combining as they have the consideration of practical subjects with more purely architectural study. Whilst heartily thanking the readers of these papers, it is a matter of regret that so few have been contributed by members.

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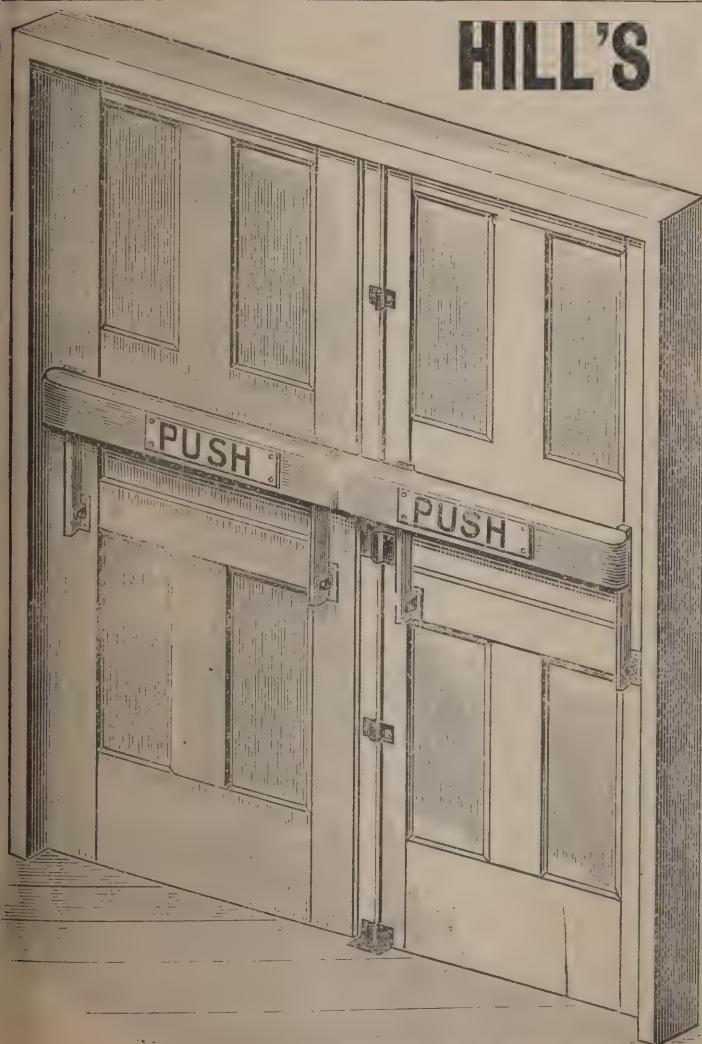
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Society, it is encouraging to be able to report a substantial increase in the membership. The total number of members and associates is now nearly five hundred.

May I express the hope that with such an enlarged constituency the numbers attending our ordinary meetings may also be materially augmented. This would be both encouraging to those gentlemen who so freely give much time and pains to the preparation of papers and also most helpful to the members themselves. The free and healthy interchange of thought upon matters relating to our art and practice has the double advantage of adding to our stock of information and confirming the opinions which we hold. It is ever true that the knowledge we impart to others becomes doubly our own.

Members must ere this be aware that the important question of examination for admission to the membership of our Society has, after careful consideration, now assumed definite shape. The scheme drafted by the Council was submitted to the annual general meeting a fortnight since. It would have been surprising if such a radical change could have been brought about without difference of opinion. Variety of opinion, however, is not generally detrimental to a cause, but frequently leads to more careful consideration of every point, and thus secures in the end a better result. In my judgment it has been so in this case. But whatever be the opinions held and freely ventilated during the time for discussion, it is the evident duty of every member, and more especially of the Council and officers, now the matter is definitely settled, to use every endeavour to carry the matter forward to a successful issue. (The President then read the decisions arrived at at the general meeting.)

In order to avoid misapprehension, it cannot be too distinctly stated that, in taking this action, the Society of Architects aims at no rivalry or competition with any other body. It is only following a course which is not unusual amongst other professional societies, and one, moreover, which is in perfect consistence with its steady promotion of the scheme for universal examination and registration of all architects.

The only object sought is one which, it seems to me, must commend itself to an unprejudiced judgment, namely, the guarding of the Society against incompetency, and securing that every one elected to membership shall have a reasonable claim to be called an architect. The provisions for a students' section have my very warm approbation, and I sincerely trust that the advantages presented will be largely embraced by pupils and others.

I referred at the outset to the steady growth in the position and influence of our Society. The extension of our membership into the colonies and other countries—the publicity afforded through the Press—the promotion of the Bill for Compulsory Registration of Architects, and lastly the incorporation of the Society, have all doubtless contributed in varying measure to this growth.

But let us never lose sight of the fact that real success and advancement both for the Society and for the profession at large depends upon ourselves. Upon what we are as men and the works we achieve as architects, more than upon any external or accidental circumstance, will depend the position we realise for ourselves, and indirectly the success and status of our Society.

With this thought as a thesis, I venture to draw your attention briefly to a few considerations affecting

The Practice and Province of the Architect.

Foremost amongst the essential elements of architectural practice I would place what I may describe as an artistic sense, the faculty of recognising and enjoying the beautiful in all things. And, more than this, an open vision to see and wisdom to understand the great underlying principles out of which all true beauty, whether in nature or art, grows.

Vital to an enjoyment of this vision of truth and beauty is a full development of our highest powers; for truth and beauty are divine whether in nature or art, and will not reveal themselves to the ignoble. But this faculty must be exercised and it will always grow by training. By long and patient study alone can these great principles be discovered, and by practice alone can they be fitly applied to our works.

The direction of the student's work will depend much upon his tastes; but a study of the best examples in Classic, Gothic and Renaissance architecture is certainly desirable. The aim of such studies should be fundamental, not with the object of slavishly copying, but of learning the principles upon which the builders wrought, and thus it will often be found that some of the principles are the same in widely differing styles.

We are often twitted in this country with having no national style, but, as the Americans say of our weather, possessing "samples only." I take it we must admit the criticism. But may not this fact be due in some measure to the oftentimes wrong direction of our studies? It is scarcely a generation back since it was a common practice to regard ancient Classic examples as objects to be copied bodily, at least as to elevation. The interior purposes of the new building might even be

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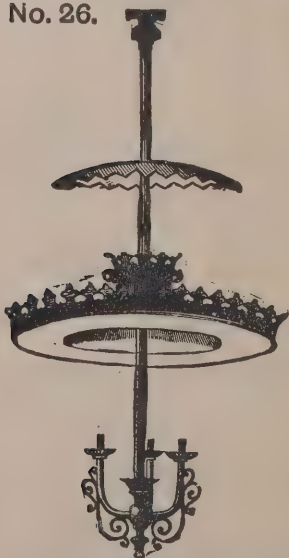
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wholly different from those of the original, but convenience of plan had to succumb to an imposing façade. The Gothic revival only in a measure mended matters for a time, for a somewhat slavish copying of detail apart from a proper understanding of principles became the fashion.

This period through which we have now happily passed has doubtless had its uses, nor can we yet afford to set aside a careful study of ancient and Mediæval art. It were, indeed, far better to copy bodily a good design than to invent a bad one. But the evil is that buildings, like plants, are often indigent to the soil and ill-adapted for transplanting to another clime. Though the maxim is not a new one, we have perhaps not yet come fully to understand how a national style can scarcely exist, at least can only be good, as it grows out of and fitly expresses national habits and characteristics.

But when we speak of the "practice" of the architect, the word itself suggests that something more than the possession and efficient training of the artistic sense goes to the making of an architect. He must also undoubtedly possess not a little practical knowledge of several sciences. Men and women have to live in the houses he designs, and to experience comfort or the reverse in using the various structures whose erection he superintends. The health of the community depends much upon his knowledge or ignorance of sanitary laws, and safety to limb and life may often hang upon the proper disposition of the materials he uses.

To the vexed question whether an architect should be an artist or a theoretical mechanic, I would reply, in a measure he must be both, and a man of business too. An artist may be a thoroughly unpractical man, no man of business, and yet a good artist; an architect cannot. On the other hand, neither has the mere mechanic or man of business, with perhaps but little art sense and no art training, any claim to call himself an architect. He may be well versed in the science of building, and able most efficiently to conduct the business of his client, but he cannot be a true architect unless he be a true artist. Lacking this, though his buildings be very ornamental, the ornamentation will probably be vicious, and though his work secure many admirers, it will inevitably be devoid of the elements of true beauty, and transgress at every point canons of good taste.

Time will only permit of a brief mention of two features of the times which present special hindrances to architectural practice. The mania for cheapness thwarts us at every point, often curtailing expenditure below reasonable limits, and tempt-

ing to the improper use of materials made to imitate the functions of more costly substances. The multiplication of specialists' manufactures by way of fittings and decorative features, though it sometimes saves us trouble, tends to sameness of treatment and loss of originality, and often unhappily to the fostering of a vitiated taste for showiness and a wholesale destruction of true art.

The qualifications for the practice of architecture which I have endeavoured thus to trace (though, I fear, very imperfectly) are wide in their range, and certainly such as to make large demands upon the powers of most men. I think, however, you will be ready to admit that they are not unreasonable. But does not every consideration of the subject point again to the absolute need for a careful education and training for every architect?

Let us now turn from the qualifications for the practice of architecture and inquire what are its limitations. What is the province of an architect? One thing must be evident from our previous survey. Unless he become a specialist, the variety of the buildings which an architect may be called upon to design will of itself present a wide scope for the exercise of his talents. He may be to-day designing a church and to-morrow a dwelling-house, school or factory. He need not, it is true, have a previous knowledge of all the technical requirements for which such buildings, for instance, as factories are needed; but he must be able readily to grasp these requirements, to invent methods for overcoming difficulties, to guide and advise clients who often scarcely know their own needs, and to throw all into forms of beauty framed out of suitable and enduring materials.

Such duties are not light, and surely a man with any amount of practice might find in their faithful exercise ample scope for time and genius. And what are the facts of the case, gentlemen? A study of local directories would lead us to suppose that many architects must, indeed, be men of Herculean powers. In fact, architecture seems to have been tacked on as a light and pleasant pastime relieving the more serious occupations of house agency and upholstery. A notice-board not far south of London announces the happy combination of "architect and coal-merchant," while I have heard on good authority of a certain publican who varies the tedium of drawing pints of ale by designing and superintending the erection of hotels and taverns.

There is, of course, an evident unsuitability in such combinations as these. They approach the ludicrous. But in these days of keen competition it becomes a matter for quite



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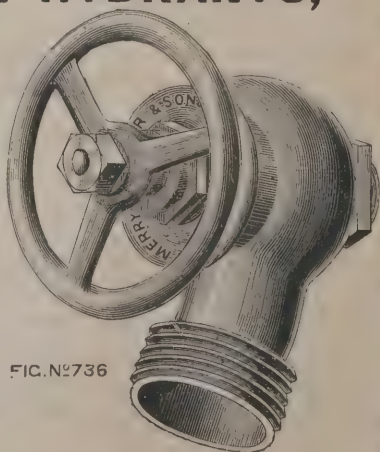
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serious discussion what occupations, if any, beyond his evident sphere, an architect may fitly engage in. It would often doubtless be to his pecuniary advantage to undertake house and estate agency. It must, however, always be to the detriment of his art. If such a combination can be justified at all, it should at least be by way of recognised partnership, the partner who has been trained as an architect having freedom to give his undivided attention to architectural work.

It has always appeared to me perfectly legitimate and sometimes advantageous for an architect to take out his own quantities. He must know best his own intentions, and if he has a proper knowledge of the science should be best able to make the quantities a true expression of those intentions. An architect in large practice will, however, not often have time for this. When the work is done by a surveyor he should be working in full concert with the architect, and whether the quantities form a part of the contract or not, it would be better if they were always recognised and paid for by the employer.

Land surveying and the laying-out and development of estates is another large branch of work in which architects frequently engage.

As regards the former, it is certainly admissible for an architect to measure and level the sites for his own works and he should at least be able to do this. In respect to the latter, it would doubtless be much to the advantage of the estates if an architect had at least some share in their planning. In this as in other matters very much must depend upon the time at his disposal. I cannot see that there is necessarily in the work itself anything inappropriate or injurious to the proper exercise of architectural art.

Surveying for dilapidations is another branch of work which, at least in the provinces, is always regarded as coming within an architect's practice. It is certainly one which his general experience specially fits him to perform judiciously.

The question whether architects should advertise opens an oft debated point. Much depends upon the manner of advertising. It cannot reasonably be denied to an architect to use some legitimate means of making himself known. But should not his works be his best advertisement? and why should he not place his name upon them in some modest spot as an artist or sculptor does? There is something very different in this from the ordinary trade advertisement. For myself, I much doubt whether advertising in the ordinary trade sense is of any use to an architect; but whether it be so or not, it is utterly repugnant to good taste.

The following is an actual specimen of this kind of advertising, which fortunately has not yet become common amongst architects. "Designs for chapels and schools. Pretty, inexpensive, free from damp and echo. Upwards of eighty have been erected during the past eight years and the demand is still increasing." And then follow paragraphs headed, "architectural beauty, echo, damp, ventilation, extras and disputes," &c., in all of which points the author claims exceptional success. The circular closes with an offer to forward photographs or lithographic views of chapels in various styles at a charge of 6d. each below 400 sittings and 9d. each above. Comment is superfluous. I am tempted, however, for a moment to translate it into another sphere and to read:—"A. B., poet. Poems of all sorts composed at the shortest notice. Heroic odes, pathetic verses, elegant elegies. Specimens sent on application."

It is not always easy to stand against the fashions of such an advertising age, in which literary men and even ecclesiastics are sometimes led into the stream. But, to my mind, all eulogistic comments upon the creation of one's own brain are out of place, and must so tend to lower one's higher sensibilities as to become reflectively injurious to our art. It behoves us therefore, as a Society, very strenuously to set our face against such practices.

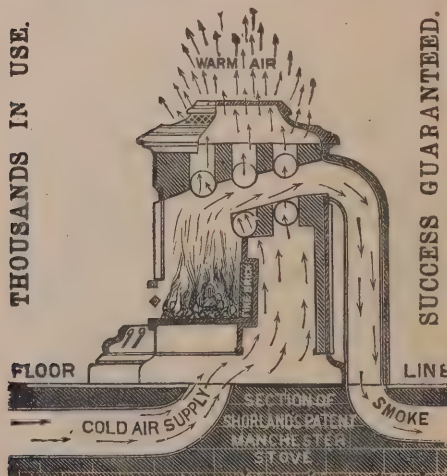
Against the acceptance by architects of commissions from manufacturers and others it is scarcely possible to utter words too strong. Architects are doubtless often put to much trouble in selection, and the unwillingness of clients to fairly remunerate for such work is strong inducement to them to seek their commission elsewhere. But the argument is specious and insufficient to uphold what can only be characterised as deception.

My aim throughout has been to demand a high standard in the exercise of our art. With class distinctions of trade and profession I have little sympathy. A calling is honourable as it is exercised honourably. Every man who does his best, whether in art or craft, is worthy of respect. But assuredly all callings do not require the same degree of ability. And without any invidious comparison, it may safely be averred that the practice of architecture ranks high amongst the professions, as one making large demands upon talent, study and close application.

It is on these grounds that I would urge the limitation of architectural practice, as much as possible, to what is certainly the main province of the architect, namely, the designing and superintending the erection of buildings.

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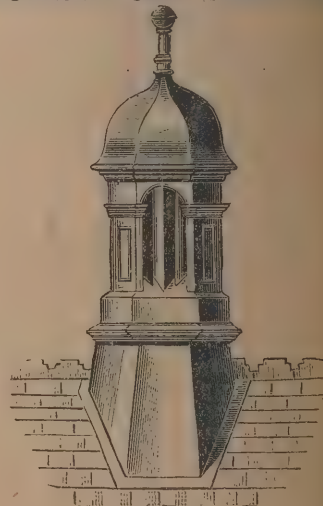
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A vote of thanks to the President was proposed by Mr. H. Lovegrove and seconded by Mr. M. Shelbourn. The annual report and balance-sheet were unanimously passed by the meeting.

CONTRACTING IN AUSTRALIA.

MR. JOHN ROBB, a well-known contractor, recently sequestered his estate. At his examination in the Melbourne Insolvency Court, says the *Australian Builder*, it was stated that when the insolvent filed his complete schedule on May 3 last his liabilities were 681,505*l.* and his assets were 448,528*l.*, leaving a deficiency of 232,977*l.* The insolvent attributed his failure to depreciation in the value of the investment stocks and real estate, losses in squatting and sugar planting, and losing an arbitration case with the Queensland Government in connection with the Cairns railway, for which he was a contractor. In 1889 a balance-sheet made of his affairs gave a surplus of 445,344*l.* The schedule showed that within two years and nine months of his insolvency he lost 522,163*l.* In those same two years and nine months a profit was made on his railway contract in Queensland of 123,914*l.* He had a claim against the Queensland Government of 262,311*l.* in respect of his contract, which was referred to arbitration, and he obtained an award of 20,807*l.* on it, but the arbitration cost him 26,000*l.* Before the arbitration he was offered 100,000*l.* by the Government.

TESTING WHITE LEAD.

THE following suggestions for testing the quality of white lead are offered by the American Association of Master Painters. Coat a board primed in ochre with a mixture of one ounce of oil and two ounces of lead. Then put on a second coat over the entire face of board, excepting a small portion in the middle. When this is done, put a third coat over all, excepting another small space, with a mixture also of one ounce of oil and four ounces of lead. Allow one week to elapse between each coat and paint the boards while in an upright position. The board will, when finished, have been painted as follows:—In the middle there will be a narrow space showing ochre priming and on the left of it another similar space of one coat of lead; on the right of the ochre priming space, as well as on the left of the one coat space, will be similar small spaces, each

being covered with two coats, and on the right and left respectively of these will be a larger space, covered with three coats. After the last coat has been on three or four days, place the boards where they will get a southern exposure and if put over a roof at least two feet above same. If the boards are dry to the touch they should be placed out of doors for a day or two between coats. The brush should be used to finish the mixing and the boards should not be sand-papered. The test being one of comparison a separate board must be painted with each of the leads about to be tested. It will not be necessary to use a separate brush for each board if there are so many of them. Benzine is chosen as being more volatile than turpentine to wash out the brushes. Keep the brushes in oil when not in use. The test is intended principally as one of durability, and as after long exposure the covering qualities of the different leads will not be easily determined, they should be noted at the outset.

THE SURVEYORS' INSTITUTION.

THE first ordinary general meeting of the Surveyors' Institution for the season was held on Monday evening. Mr. Thomas Chatfield Clarke, the president, delivered an opening address. In this he remarked that in 1872, when he first joined the council of the Institution, they had but 279 of all classes, including a humble contingent of four students, on their roll. Since that time the figure had, in spite of natural losses, mounted to nearly 2,400 of all classes, including a body of close upon 200 students. These figures indicated a great material success, and bore testimony not only to the position which the Institution occupied in relation to important interests, but also to the extent to which it had fulfilled its duty to the profession which it represented. But if they were to prosper in the future as in the past, and were to keep in touch with the times, they must be careful not to rest content with obsolete ideals. There were everywhere signs of departure from old landmarks, from principles which, however unchallengeable a few years ago, and however defensible in the abstract at the present time, were getting, not necessarily by any fault of their own, "out of correspondence with their environment." The spirit of unrest that was making such headway in every country in Europe was just now addressing itself with special vehemence and pertinacity to questions affecting property, an institution which, of course, lay at the basis of all national stability and progress. He was one of

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those who held the belief that nothing would be more calculated to paralyse our national life than the wide prevalence of the preposterous demand for the nationalisation of all property, which had lately found favour in quarters from which better things might have been hoped for. But, while condemning in the fullest manner extravagances of that kind, he felt that they would not be serving the cause of order and social stability if they allowed themselves to be drawn into an unreasoning advocacy of every franchise and privilege, unless it could be defended on grounds of abstract right and strict justice between man and man and unless it was adapted to the wants of the time. There was probably no body of men who possessed, by the necessities of their calling, more practical sagacity than the surveyors of England, and it was his sincere hope that they would be found, in the difficult times which might shortly come, co-operating with the best intelligence of the country in the endeavour to protect the institution of property, less by an insistence upon strict theoretical rights than by placing it on such an equitable basis as would command the confidence and assent of the large mass of the community.

From a professional point of view there has been no more important piece of legislation in recent years than the London Streets and Buildings Act, which received the royal assent on August 25 last. It may be worth while to place on record in this address the genesis of the new measure and to indicate the leading share which the Institution has had in moulding its provisions in the various stages of its evolution. For many years past it has been felt that the Act of 1855 has been outgrown by modern requirements, and that the existing law was insufficient for regulating many details of new construction and materials. Endeavours have been made to cure this by several auxiliary enactments, and by by-laws framed by the Metropolitan Board of Works, and subsequently by the London County Council, under the Metropolis Management and Building Acts Amendment Acts, 1878 and 1882. It was felt, therefore, that the time had come for the codification of the law relating to building, and the first step taken in the matter was the production of a draft Bill under the title of the London Building Law Consolidation Bill, issued by and apparently prepared under the auspices of the Local Government Board. Copies of this draft Bill were forwarded to the Institution and to other Societies, accompanied by a request that the Institution would furnish the Department with comments on the Bill. The Council pointed out, in reply, that what was really wanted was not consolidation, but a new Act; but on being further pressed for suggestions they appointed a strong committee, who devoted a large amount of time and labour to the work of engraving on the Consolidation Bill the additions and amendments in their opinion necessary for making it a useful working measure.

The matter apparently slept until, in December of last year, the Council received copies of a new Building Bill, prepared by the London County Council, embodying some of the suggestions made by the Council of the Institution to the Secretary of State in connection with the Consolidation Bill already referred to.

The building committee of the Institution devoted a very large amount of time to the consideration of the new Bill, and finally nominated their colleagues, Mr Rickman, Mr Garrard, Mr Steward and Mr Cubitt Nichols, to represent the Institution at a conference with the building committee of the London County Council, and to press the adoption of the amendments proposed by the Institution.

They were met in the matter in the most friendly way by the representatives of the London County Council, but failing to obtain concessions on some important points, they were authorised by the Council to draw up and lodge a petition in opposition to the Bill.

After a prolonged fight in the committee-rooms of the House of Commons, the representatives of the Institution (for this purpose Mr Steward, Mr Garrard and Mr Cubitt Nichols) succeeded, themselves or in concert with others, in modifying or getting rid of most of the more obnoxious features of the Bill, and were able to appear in support of the greater part of it before the committee of the House of Lords. The Council and particularly those members of it referred to have spared neither time nor trouble in the endeavour to secure a Building Act worthy of this great Metropolis, and although it has involved the Institution in an expenditure of nearly 900*l.*, the members must feel that the money had been well bestowed.

Mr. Clarke said he must also congratulate the Institution on the position accorded to it by the Act, in relation to the Tribunal of Appeal. The position conceded to the Institution nominee by the London Council General Powers Act, 1890, is greatly emphasised in the present Act by the establishment of the tribunal on a formal basis and by the great enlargement of the scope of its operations. The willingness of the London County Council to refer appeals on technical matters to a tribunal of experts may be justly said to be a strong testimony to their desire to act fairly as between the various interests involved.

The subject of betterment we must regard for the present as in a state of suspended animation, owing to the action of the House of Lords in excising the clause which embodied it from the County Council Bill; not on the ground, judging by their report on the general question, that the principle is itself unjust, but that it has not yet been clothed with any practical plan for putting it into equitable operation. It is only the extreme opponents of the principle who deny in the words of the Lords' report, that "persons whose property has clearly been increased in value by an improvement effected by local authorities should specially contribute to the cost of the improvement." The whole difficulty arises from the incertitude of the operation of a public work in raising the value of neighbouring lands, and it is noticeable that the Lords point out that the evidence of eminent valuers is in conflict on the question. He for one was not disposed to quarrel with some of the proposals of the Lords' committee for protecting from possible injustice the persons to be charged with a "betterment" rate. It is fair, for instance, that within a reasonable time after the completion of the work the owners of the properties affected should receive notice of the amount of the special rate which the local authorities propose to impose on them; but this does nothing to remove the difficulty of deciding whether the period is sufficiently long to adequately test the effect of the improvement, or so long (after the execution of the improvement) as to damage the market value of the property. But it is, of course, the peculiar duty and province of a surveyor to estimate and advise on such questions.

He was not sure that he could give an unqualified acquiescence to the proposal to give the person to be charged the option of going before a jury; not that he had any feeling as regards the fairness of this "Palladium of British liberty," but because a jury is summoned *ad hoc*, whereas the decisions of an arbitrator, dealing with all matters arising under the scheme, would be more likely to result in an equitable distribution of the charge among the various persons affected.

The "worsement" principle is reduced to the narrowest limits by the proposal of the Lords' committee to confine it to property, in the immediate neighbourhood, belonging to the owner charged with the betterment rate. It is not probable that many claims of this kind can arise, or could be substantiated if they did arise, and the contingency, thus limited, may fairly be disregarded in considering the question. He could not, however, agree with the proposal that, where the "owner is of opinion" that the charge exceeds the enhancement of market value due to the public improvement, he should be entitled to claim that the Local Authority should purchase the property in question at its previous market value. Surely a right to compel the Local Authority to purchase should depend upon something more tangible than the "opinion" of the owner, and he could not think that the suggestion was put forward seriously. There can be no objection to the settlement by arbitration of any question that arises as to the incidence of the betterment charge between any of the persons entitled to different interests, though it would seem that the matter could be better dealt with by the publication of example cases after the manner, though not necessarily on the lines, of those prepared by our associate, Mr. Harper, in connection with the question of the rating of ground values.

There was a good deal of evidence before the Lords' committee with reference to the alternative principle of "recoupment," some of it of a very conflicting kind. The report seems to imply a preference for this method of recovering the cost of an improvement and a belief in its sufficiency, if the local authorities can be relieved of the necessity of buying out the trade interests, these having so far proved most costly in carrying out the large schemes in the Metropolis and elsewhere. Personally he doubted the advisability, from the point of view of public policy, of allowing local authorities to become land dealers on a large scale, and the experience of some few years since in this direction should be a warning to avoid what then proved to be a great scandal.

On the whole, notwithstanding the temporary *impasse*, he thought the air had become to some extent cleared by the fiery ordeal through which the question has passed, and that a plan will yet be found of imposing in an equitable way a charge which most people agree is not inequitable in principle and essence, and which might operate with advantage by reducing the cost of metropolitan improvements, and thereby increasing the extent of many needed works.

SEWAGE PURIFICATION.

A REPORT on sewage purification has been prepared by Mr. T. Hewson, the Leeds city engineer. During the last few years the streets and sewerage committee have inspected the sewage works of eleven towns. At Acton, Middlesex, with a population of 23,000, the sewage from about 10,000 is treated by precipitation and filtration. It is treated with a liquid called

ferozone, for which the International Purification Company hold a patent, and which costs 2*l.* 5*s.* per ton delivered. There is a sale for the pressed sludge at about 4*s.* 6*d.* a load, and some of the pressed manure is ground and sold at 30*s.* a ton. The county borough of Croydon cleanses its sewage upon two irrigation farms. One of them contains 616 acres, of which 451 are utilised, and there the sewage of a drainage area of 6,300 acres and of a population of over 85,000 is treated. Mr. Walker, the borough surveyor, who has been intimately connected with the management of the two farms for twenty-three years, states that almost any kind of soil and subsoil will cleanse sewage by broad irrigation; that as a part of the land has been under irrigation for thirty-four years, and is to-day in as good a state to cleanse sewage as it was at the beginning, it may be inferred that under fair management land will always retain its power to cleanse sewage in that way; that the working expenses of a broad irrigation sewage farm will generally be covered by the receipts from the produce grown upon it; that no nuisance will be created by a sewage farm if properly managed, and that sewage can be properly cleansed by broad irrigation all the year round. At Wimbledon the methods adopted are precipitation, followed by filtration, partly through filter beds and partly through land, but owing to the difficulty of acquiring land of a suitable price and character, the lands now used for broad irrigation are being converted into specially constructed filtering areas, the filtering materials being composed of burnt clay found in the land. At the London Sewage Works, at Barking, a normal daily flow of about 100,000,000 gallons of sewage is satisfactorily treated by precipitation, the resultant sludge, to the extent of 2,500 tons per day, being sent to sea in steamers and discharged. The cost of the whole works was about two and a half millions sterling. At Ealing the precipitation process is adopted and the sludge is burned, along with house refuse, in a destructor which obtains a very high heat by having a cremator attached. Since the cremator was added no complaint has been made about the destructor. The destructor costs about 3½*l.* per ton, exclusive of capital charges. Birmingham sewage is cleansed by precipitation and irrigation, the total area of the works and farm being 1,299 acres. The contributory population is 650,000 and the daily dry-weather flow of sewage over 22,000,000 gallons. Although the net result shows that irrigation almost pays its own working expenses, there is a dead loss of over 12,000*l.* on the precipitating and tank process and the total charge on the rates for sewage purification for 1893 was 33,000*l.* Fruit, celery, cabbages, mangels, ryegrass, &c., are grown on the land very successfully and from 160 to 170 milch cows are fed upon a portion of the produce. The yearly average yield of milk is over 850 gallons per cow and the whole supply in 1892, when the committee visited the works, was sold to one customer, who paid 6*d.* a gallon in summer and 8*d.* a gallon in winter. At Sheffield from seven to eight million gallons of sewage a day are dealt with by precipitation and the works cost 8,000*l.* or 9,000*l.* a year. Difficulty is experienced in getting rid of the sludge. Blackburn, which was one of the first towns in England to attempt the purification of its sewage, employs the broad irrigation system. The land is let off to tenants, who take the sewage as they require it, but no profit accrues to the Corporation, as the rents only amount to 1 per cent. on the original outlay. Owing to the unsuitable nature of the land already used, further purification of the sewage is needed, and precipitation tanks are being, or have been, erected for the purpose of preliminary purification. On the occasion of the visit of the committee the temperature was below freezing point, but where the land had been in actual contact with the sewage for a few hours it was not frost bound. The broad irrigation principle is also adopted at Dewsbury, and the crops are principally mangels, carrots, turnips, beans, rye grass, comfrey and osiers. The whole of the land is always producing something. Thirty-three dairy cows are kept, and the produce they and the horses do not consume finds a market. Neither factory nor dyeworks sewage is admitted into the sewers. The effluent is a good one. At Manchester precipitation and irrigation works are in progress, and partially in use. At Huddersfield precipitation tanks and filter-beds are employed, the sludge being destroyed in a house-refuse destructor. In 1870 the immediate necessity of purifying the sewage became evident to the Corporation of Leeds, and it was eventually decided to construct experimental works on the precipitation system, and to adopt the process of the A.B.C. or Native Guano Company, the Corporation granting a lease of the works to the company for twenty-four years. In 1874 the permanent works were completed, the total cost being 57,524*l.* 1*s.* 2*d.* Details of the process are given in the report. It is sufficient to say here that in October, 1871, the Native Guano Company commenced to purify about one million gallons of sewage daily, and that they obtained an excellent effluent, bright and clear and free from smell or taste. But the expenses proved greater than had been anticipated; difficulty was experienced in selling the manure at a remunerative price, and in 1873 the company were released from their contract. Various experiments were afterwards tried in turn

by Mr. Sylvester Fulda, General Scott, Mr. Rupert Goodall, of Armley, the Native Guano Company, Mr. John Hanson, of Dewsbury, and again in 1876 by the Native Guano Company. The processes of Mr. Goodall, the Native Guano Company and Mr. Hanson, which are described in the report, were chiefly dependent upon lime, and in most cases difficulty was experienced in extracting the colouring matter discharged from the dye-works from the sewage. Since 1876 the Corporation have had no further experiments and the precipitant used has been lime only, the quantity being about a ton per million gallons of sewage. The effluent is most satisfactory, the discolouration from dye being only periodical, and then very slight. Though the sewage sludge largely accumulated so long as any charge was made for it, the farmers now that they get it free remove all that is made. The revenue expenditure for the year ended March 31 last on the sewage purification was 5,660*l.* 7*s.* 8*d.*, this of course being exclusive of interest on and repayment of capital.

ENGINEERING WORKS IN EGYPT.

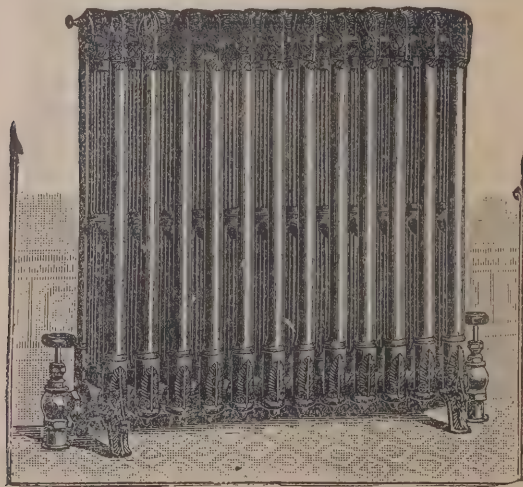
ON Saturday evening Sir Colin Scott Moncrieff delivered a lecture at the Working Men's College, Great Ormond Street, on Egypt and the Nile. After observing that the cultivated valley of the Nile, which alone is Egypt, was only about 10,000 square miles, or half as big again as Wales, or one-eighth of Great Britain, and after a short narrative of the recent history of the country, he described in detail the engineering work which had been accomplished during the period of British occupation. The old system of irrigation in Egypt, he said, which made it the granary of the world, only dealt with the Nile in flood. A line of embankments was made along each edge of the river, too high to be topped even in flood. At right angles to these, about five miles apart, other embankments were made, going right across the valley and so dividing the country into a series of oblong areas. Short canals were cut from the river into each of these areas or basins, as they are called. As the river rose these canals filled, and the whole basins were flooded 3 or 4 feet deep. The still water parted with its mud and thoroughly soaked the ground. In October the river began to fall; the water was run back into it and the basins emptied; then, as soon as a man could walk across the mud with a pair of bullocks and a wooden plough, or even the branch of a tree, the mud was turned over and sown. So soaked was the soil that the wheat or barley at once sprung up, and without a drop of rain or any further watering a fine crop was reaped in April, and then the field lay baking in the sun till next flood. Such was the ancient system, and it has come down from the time of the Pharaohs, and is the system to this day throughout the greater part of Upper Egypt.

But in this century a change was introduced. Egypt was for many years ruled by a very sagacious although unscrupulous man, Mohammed Ali Pasha. He saw that with its soil and with its climate Egypt could grow something more profitable than corn. Europe could pretty well feed itself with this commodity, but Europe could not grow cotton and sugar-cane products of great value, which Egypt could grow quite well if only they could get water all the year round, for the cotton must be sown and the cane planted in March, and from that time onwards throughout all the heat of summer they must be regularly watered. The water was there, flowing out to the sea, but how could it be raised on to the land? I have told you the Nile rises 25 feet; so a canal flowing 12 feet deep during flood has its bed 13 feet above the river level when the Nile is at its lowest. Mohammed Ali began by cutting a great system of deep canals all over the Delta, into which water would flow when the river was low, and from these canals by various rude contrivances it was pumped up and poured over the land. But this was a great labour, and worse than this, when the flood came the deep canals became choked with mud, and had all to be dug out again.

Then some one advised that a great dam should be built across the two branches of the Nile at the apex of the Delta, and the water raised just as it is by a mill dam in this country, and a great work was started, known by the French name—the barrage. It consisted of a bridge over each branch of the river, one consisting of sixty-one, the other of seventy-one arches of 16-feet span. These were to be fitted with drop-gates, to be kept down during low Nile so as to pond up the water, and to be raised out of the way during flood. The water held up was to flow down three great canals—one on the east side of the eastern branch of the river, one between the two rivers, one on the west side of the western branch of the river; and from these canals into minor canals, and at last on to the fields. The barrages were finished in 1861, but gates were only fitted into one. Signs of settlement appeared, and in 1867 a great crack split the whole bridge from top to bottom. The Egyptians did not know how to mend it. They did not believe it could be mended, and went back to the old system of digging out their deep canals.

When I got to Egypt everyone said, "Whatever you do, do not touch the barrage; it is hopelessly unreliable." But my companions and I felt, if we were to do any good, we must either put this great dam right or build a new one, for it was absolutely necessary to get control of the Nile water. So we resolved to see what the cracked dam was worth. When the gates were open there was no more pressure on the barrage than on an ordinary bridge, but when they were closed the water above was calculated to rise as much as 13 feet higher than the water below, creating a heavy pressure on the work, and as it was founded only on sand and mud the tendency of the water would be to work its way under the foundations, scouring out the soil till at last the whole work might fall in. We found on the Rosetta or western branch barrage (the only one in which gates had ever been fitted) tremendous cracks through two or three arches, but still we resolved to test the work. If it smashed there was no very great harm, while if we could anyhow make it stand the gain would be enormous. On the other hand, there was a host of jealous foreigners delighted to see an English failure. In January 1884 an excellent English engineer took up his residence at the barrage. The first thing to do was to put little patches of cement every here and there across the cracks, and these were all numbered. Then about 26,000*l.* were spent in strengthening the rough stone protection below the bridge and in replacing new timber for the old. All this time the river was slowly falling. We resolved after it fell to a certain point to begin to close the gates. Daily the river kept falling. Daily we closed another gate, and daily the English engineers went round all the little patches of cement. We feared that, as by closing the gates the water rose up stream, the pressure would be too great for the work and the cracks would open out afresh, in which case our little cement patches would crack too. So long as they showed no crack, so long we knew there was no fresh mischief at work. We had to proceed very carefully and it was anxious work, but at last we had raised the water 7 feet 2 inches and then I thought that enough for 1884. This made a tremendous difference to the cotton crop. I have said the water was intended to go into three main canals, but only one of these, the central one, had ever been properly finished. The eastern one had never been made at all. The western one was half full of desert sand. But the centre one this year contained 7 feet of water more than it had ever done before in the hot parching months of May and June. And the result was that the cotton crop, which had never before exceeded 130,000 tons, came this year to 160,000,

and as each ton was worth about 55*l.*, these additional 30,000 were worth 1,650,000*l.*, which was not a bad return for the 26,000*l.* we had spent. This was so encouraging that the following year Lord Cromer, in spite of the low state the finances were in, managed to get a million sterling, which was made over to us to spend in putting right the irrigation works of the country. Then we knew we could repair the barrage thoroughly. We got four more trained Englishmen from India and set about the work. A distinguished English engineer had offered some years previously to repair the work and he proposed to do it by sinking a great wall right across the river, to go down 60 feet below the bed, and this he estimated would have cost alone 1½ millions. We resolved not to try it, first because it was so dear and also because we feared that if we dug any such hole the barrage might slide into it bodily. The task was very difficult. We had to shut off a piece of the river, enclose it with a bank, pump out all the water to the very bottom, then examine the state of the foundations and do what was necessary to strengthen and repair it. We were not certain if we could lay bare the foundations like this. The falling flood would not let us begin before November, and the rising flood of the next year forced us to close at the end of June. In March, 1886, we made our first earthen embankment round twenty arches at the west end, which was the part most badly cracked. We pumped out the water from within, and found that by keeping steam-pumps constantly at work we could keep the bed of the river quite dry, although the water was 18 feet deep outside. The cracks looked worse than we had expected when we got right down to the floor, but it was a great thing to have got down. Soundings had told us that for more than 200 feet deep there was no rock to be found below, only sand and mud. We were required to prevent the water passing through this under the work, and yet it was impracticable to make a very deep foundation and to rest on firm rock. We resolved, therefore, to adopt an Indian plan, and to spread the foundations out very wide. We found that from up stream to down stream the width of cracked, badly-built flooring was 112 feet. We just doubled it to 224 feet. We covered the old flooring with a solid mass of concrete and stonework 4 feet thick and prolonged it up and down stream, while along the upper edge we drove a line of what is called sheet-piling 16 feet deep, *i.e.* wooden piles dovetailing into each other so as to form a continuous wooden wall, so that the water would have to percolate under this wall and through 224 feet of sand and mud before it could get out on the down-stream face. That first year, 1886, was only a trial



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year. But we finished the flooring of sixteen arches like this, placing just below the bridge heavy dressed blocks of hard stone, which we got from the Alps. At the end of November 1886 we began our preparations for next season. We could not close off the whole of either branch of the river any one season, but we determined to do a half. And as there were two branches, that meant four years' work. It took us till the middle of February to get our embankments round one-half of one of the barrages. It took three weeks longer, with twelve steam-pumps working day and night, to get the water out of the enclosed space. Then in March we set to work, and went on day and night without a break, working at night by electric light, till the end of June. I remember on July 1, 1887, we had finished one-half of the Rosetta barrage. We had daily reports of the progress of the floods, and got the last of our steam-pumps out of the bed that day. Before daylight next morning the flood was over the whole floor. The embankments, which had taken us three months to make and had cost about ten thousand pounds, were all washed away by the rising flood, and no work was possible till the middle of the following November, when we began new embankments, enclosed another half of the river and did another hard season's work. We had sometimes as many as 10,000 men at work—Arabs, of course, chiefly, Maltese, Italians, Greeks, Syrians, a few Frenchmen. There were perpetually new difficulties meeting us. Sometimes in the middle of a nice, clean, new piece of stone flooring a great spring of water would burst out and cover the whole with black mud, and rise deeper and deeper till it was stanchied. But by careful management the engineers in charge triumphed at last, and on June 16, 1890, they reported that all was finished up to water-surface line. We could take away the embankments then with safety. Since then no one has seen the dry bed of the Nile, nor, I trust, will see it for many a day to come. Altogether, about 460,000*l.* was spent on this work, and Egypt is yearly the richer by an increase in the cotton crop worth at least two and a half millions sterling.

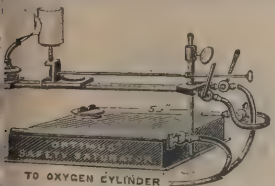
That has been the biggest and, on the whole, the most difficult work the engineers have done in Egypt, but there have been many others. The great canal at the east end of the barrage has been constructed; that at the west end has been remade. One curious bit of work was moving the Nile itself about a quarter of a mile east, so as to get it to come straight on to the barrage. This was done in about five years by building out stone groynes on the west side and so forcing the current to turn eastward. Where these groynes were built

in water, sometimes 40 feet deep, there are now fields of corn, and where there were fields there is now deep water. As irrigation without drainage always tend to injure the soil, and as drainage had been quite neglected, it had to be taken in hand? and when I left Egypt two years ago about 1,000 miles of drain had been made. The canals having been intended for irrigation only, the wants of navigation had been totally neglected. We had therefore to select certain useful navigation lines and supply them with locks and swing-bridges to allow the Nile boats to sail freely through them. Throughout the greater part of Upper Egypt the old system is still employed of irrigating only during the floods. There is always at such a season plenty of water in the river, but unless it rises to a certain height it cannot flow over the land. This has been remedied now. About 385 miles of new canal have been made; about 300 more of old canals have been widened and deepened; more than 100 new masonry works have been made—bridges, sluices, tunnels for passing one canal under another. All these have cost about 800,000*l.*; and now, however feeble the Nile flood may be in the future, it is sure to get on to the fields. You will see, then, that the state of the river at all seasons has been provided for. By means of the barrage the whole of the water when the river is at its lowest, in May or June, is poured on to the fields, and none escapes to the sea at all, while by the measures adopted in Upper Egypt, however defective the annual flood may be, there is no fear of any part of the country not obtaining water.

One reform second to none has been carried out—rather a social and moral than an engineering reform. Since the Jews made bricks for Pharaoh the habit of the country has been to execute their public works by forced labour. In 1883 there were 85,000 men employed from January to July in clearing canals and making embankments. Forced from their villages under the lash, receiving not a penny of wage nor a mouthful of food, they were kept at work half the year. This was so much the custom of the country and it was so cheap, that it was not easy to overturn the system. But we Britons were not going to let this go on. We were told the Egyptian peasant was such a lazy fellow that he would not work for wages and must be forced. We said, "Let us try." By degrees money was forthcoming, and now the Egyptian labourer works as freely as the Englishman except in one particular work, and the cost of his labour (400,000*l.* a year) goes into his pockets (or would if he had pockets), and helps him to live better and to pay his taxes. I must not, however, omit to tell you where

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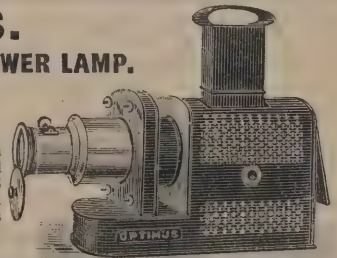
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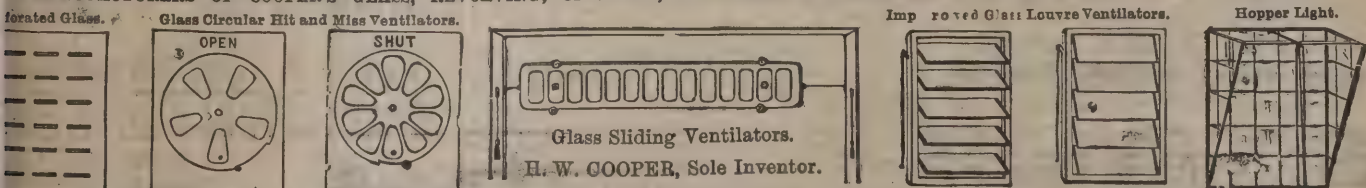


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he is still forced to work. It has always been the custom to force the peasantry to turn out during the Nile flood to mount guard on the long miles of embankment and to see that they are not breached. When we succeeded in abolishing the forced labour during the season of low Nile we left this alone, partly because it would have been very difficult to find the means of paying these labourers, but chiefly because we feared that if we made this work over to an ordinary contractor and if by any chance an embankment breached and a province was flooded, which was always a danger, there would be such a rage against the whole system of contractors and free labour that the *corvée* with all its evils might be brought back again. But it is two years since I left Egypt and I believe this Nile flood *corvée* also is now being abolished.

FOUNDATIONS IN DEEP AND UNRELIABLE SOILS.

(Concluded from last week.)

I HAVE said that from faulty foundations several Canadian structures have been wrecked to a considerable extent, but I shall only here allude to the new Joliette church, from having myself seen it now two years ago, and the blame ought to be fixed somewhere for a fault which it will probably cost all of 10,000 dols. to make good. The tower of this fine edifice when I saw it had actually sunk not less than 11 inches below the adjoining masonry of the sides, tearing itself away completely from the adjoining walls or remainder of the façade; and as lateral portions of the façade had also sunk, though to a less extent, and were bringing down the side or aisle walls of the edifice, the churchwardens had the whole front of the façade cut away from the sides to allow of any future sinking of the tower without dragging the sides with it to destruction. The other churches I have mentioned as at Nicolet, St. Casimir and St. Bazile, have been affected, I am told, exactly in the same manner, and due to a similar cause, to wit, the omission on the architect's or contractor's part to so proportion the breadth of footings as to cause every square foot thereof to bear an absolutely equal load on such a soil as at Joliette, where there are some 8 feet thick of sandy clay overlying some 20 to 30 feet of mud or of clay of such a soft and semi-liquid nature that anyone can drive an iron rod into it to a depth of 20 feet or more. And this proportioning of the area of footings is such a simple thing to calculate that it is criminal, to say the least, to neglect doing it. Again, in this case of the Joliette structure, the foundation, I am told, of the tower and remainder of the front

elevation were sunk to a greater depth than those of the aisle walls, a very foolish thing to have done, as it left less of the comparatively solid upper stratum of sand between the wooden platform under the walls and the soft clay below, thus increasing the tendency of the heavier walls to penetrate into the soft substratum. Now the architect who planned the structure, it is said, disclaims all responsibility in the premises, as not having been employed to superintend the construction of the building; and the contractor says that neither is he responsible, as he executed the plans as prepared by the architect; and so between them both it appears that the parish will have to foot the bill of reconstructing the whole façade and tower at the parishioners' expense.

I had the honour at our last meeting in Quebec of reading you a paper on the "Necessity of a School of Architecture for the Province of Quebec," or I should more aptly have said, "for Canada as a whole," since similar failures have occurred in Ontario; and now I presume it will not be denied that such a school is of paramount necessity, where an aspiring architect may be taught the importance of sounding and boring the soil he plans to build on, and in any case where not on solid rock or an unyielding base, not fail to spread his footings in a way to make them truly proportional to the respective weights they will have to bear.

Errors so expensive to make good should not occur again as at St. Bazile, where the walls sank some 2 feet and the masonry had to be almost entirely rebuilt at a cost of some 12,000 dols. At Cornwall the settlement was not less than 2 feet 10 inches and occurred all at once, I am told, on or during a single night—the front wall tearing itself away from the remainder of the church and sinking bodily and equally all through, or in a way to allow of making good the levels of the doorways without the necessity of demolishing and rebuilding the front and tower.

Foundations may be considered the engineering part of architecture and it is strange and hard to see how, while an engineer will never attempt to drive a pile or sink a caisson or start the foundations of any structure without sounding the soil he has to build on, an architect can consider himself less liable to the danger of unequal settlement. The *Canadian Architect and Builder* in an article in its November issue of last year, insists on this engineering knowledge on the part of architects, and it is to be hoped that the absolute necessity of the thing will now be seen and not forgotten in the future.

Not only the settlement is to be guarded against, but

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inequality of settlement in the different portions of a foundation. It is just as easy to erect a heavy structure on a mud foundation and insure its permanent verticality as to cause a heavy ironclad to ride at ease and upright on its bed of water. This can be done, as said, by thoroughly proportioning the area of base of each portion of the structure to the weight it has to bear, which will insure absolute equality of settlement in any homogeneous soil; but if one or two corners of a structure be on rock or any such unyielding foundation, then it becomes peremptory in the other portions to reach the rock or rest on it by the proxy of piles or pillars driven down to an equally unyielding bottom; or if not, to see by trial how much the soil can bear without sensible compression and divide the weight, or spread it out over such a number of feet as will meet the requirements of the case. If a reliable bottom is to be reached by piling through a bed of stiff or compact and so to say incompressible sand, it must not be forgotten that material aid can be had by applying the loosening, disintegrating power of water. I had to do this myself when boring in 1876 for the tests as to the nature and impermeability of the soil or river bed to be built on. The sand was so compact that a 2 or 3-inch tube could not be driven into it to more than a few feet without the aid of a jet of water forced down through an inner and smaller pipe, and which loosened and disintegrated the sand beneath the outer pipe in a way to cause it to sink to a depth of 70 feet to rock bottom, while room was made for the advancing pipe or pile or borer by the water forced down, as said, through the inner tube, coming up or returning through the space between the tubes and bringing up the loosened sand with it. Ordinary wooden piles may be driven in the same way through stiff and otherwise unyielding soil, by the use of water under pressure forced down through a pipe or hose attached to the side of the pile and reaching to its shoe or point, and easily removable and to be used again on each succeeding pile. This most effective mode of loosening the soil is much used and has been for some years past in pursuing excavations under water, and in fact in all possible situations, and the material removed, it must be remembered, can now, instead of having to be so removed by cartage, be blown away to any distance by forcing it through pipes of adequate size or even rubber or canvas conduits under air pressure, or which is the same thing, by pumping out the air in front or ahead of the material to be discharged or removed, when the mere atmospheric pressure of over 2,000 lbs. to the square foot blows the stuff along to its destination.

The most advanced practice in caisson foundation building is perhaps that now being pursued in putting in the piers for the American Surety Company's building in course of erection opposite Trinity Church, corner of Broadway and Pine Street, New York, by Bruce Price, architect of the new Frontenac Hotel, Quebec. These foundations are 70 feet deep to the bed rock, while the building of 22 storeys or 360 feet in height above road level, and therefore higher than Trinity Church itself, will have a total height of not less than 430 feet, its cost being put down at some 2,000,000 dols. Messrs. Soozsmith & Co. are the engineering firm of contractors. I say "engineering," because nowadays the responsibility for solidity and permanency of construction devolves on the contractors equally with the designing architect. These firms of builders employ the highest engineering talent, for it must not be believed as popularly thought that all the engineering difficulties are in advance wrought out and solved by the designers. On the contrary, Sir Benjamin Baker in the construction of the Forth bridge, where the twin spans are each some 1,700 feet from pier to pier, gives the greatest credit to the contractor's engineers for their many ingenious devices in carrying out the work. In the case under consideration—the American Surety Company's building—there are thirteen brick piers on as many rectangular steel-built caissons of $\frac{1}{2}$ -inch stuff, braced on the inside. The caisson is 7 feet high beneath the roof of heavy I beams, its sides carried up 2 feet all around above the roof, with a 2 feet filling of concrete on which the brick piers rest. The whole foundation was excavated bodily and taken out down to 20 feet beneath the roadway, at which depth water was reached. The caissons were then put in place—not all of them together, but in alternate series, so as not to risk deranging the foundations of adjoining structures, sunk to a lesser depth than that to be arrived at. To each caisson is applied a tube of oval horizontal section, and of such size, some 3 by 5 feet inside drain, in the clear of jointing flanges, as to allow of the men passing up and down to and from their work, and to give passage to the buckets, go and come, by which the excavated material is raised from within the caisson to the surface. The brickwork upon the caisson progresses as the caisson sinks gradually to destination with its increasing burden of advancing masonry. As the pier advances or is added to in weight, additional lengths of iron shaft, or well, or vertical tunnel-way are added and bolted on, air tight of course, and as the shaft gains height the air lock rises with it. The construction and use of the air lock, though presumably well

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known to all, from having now so often and for so many years been used, as in the construction of piers of the Brooklyn Bridge and elsewhere, is a mere cylinder, a component portion of the shaft, high enough and of sufficient size for several men to stand in at a time. It has an under and an upper door or hatchway, through which the workers in the caisson pass up and down or to and from their work. If there were no water to contend with the simple shaft way through the pier would be sufficient, the men working under ordinary atmospheric pressure, but the water has to be kept out to allow of excavating to the required depth to reach the rock. The pressure of the incoming water is counteracted, resisted by the pressure of the air from within the caisson outward. This pressure increases with the depth, and hence the necessity of the air back, wherein, while the ingoing and outgoing gang or band are in it, the pressure of the air, by opening a cock in the floor for the ingoers, one in the roof for the outgoers, is gradually increased or diminished in a way to accommodate the lungs and give no trouble to the individual—cause him no discomfort. This would seem to be slow work, but on the contrary, it is, under the trying and difficult circumstances, very rapid, when we consider that as much as 52 feet has thus been sunk in a single week, or nearly 9 feet per diem, which would entail a delay of only thirteen weeks or a little over three months if each pier had to be sunk separately to destination, whereas three to four of the piers can proceed simultaneously and the work be done in a month or a little more.

In the manipulation of the caissons great ingenuity is shown to remove no more earth than that which is vertically under the caisson, to avoid disturbing adjacent buildings. In sinking caissons in river beds no such precautions have to be observed, and the material excavated in semi-fluid state can be blown out instead of bucketed out, as was done in the case of the Brooklyn Bridge foundations, where on one side of the river, after the caisson reaching bottom at 40 feet depth of water, there remained 40 feet of sand still to be removed to reach the rock foundation, and this immense mass of some 70 by 100 by 40 feet, say 10,000 cubic yards, was actually blown out by all pressure through the twelve 4-inch iron pipes provided for the purpose, two to each of the six compartments into which each caisson was divided, the pipes running from the floor level of the caisson through the roof thereof and up through the masonry as it progressed, with an elbow at the top of each throwing the stuff into the river. A caisson for the foundations of a building has also sometimes to be moved laterally, and

this is done and has been done effectively with its load of brick-work on it, by thrusting it forward by struts and jack-screws from the off-side, while the on-side or that to which the pier is to be moved is caused to be gradually worn away by the disintegrating action of water already alluded to, the operation being performed by jets of water under pressure, some of them from above downward, while others as effectively do their work from beneath the lower edge of the caisson upward.

PATENTS.

This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 20633. Joseph Ferriman Waters, for "An improvement in window blinds."
- 20650. Lambert Küpper, for "Improvements in gypseous walls."
- 20662. Josef Schmitz and Christian Bürker, for "Improvements in the construction of ceilings."
- 20695. Franklin Alfred Wells, for "Improvements in water-closets."
- 20736. John Gilchrist Stein, for "Improvements in kilns for firing bricks, pottery and the like."
- 20938. Robert Cooke Sayer, for "Improvements in dry closets in which heat is employed to desiccate the soil."
- 20740. Henry Wyld, for "Certain improvements in door locks and latches."
- 20744. Edward William Ives, for "An improved system and apparatus for purifying sewage, or other foul or waste waters."
- 20777. Friedrich Ferdinand Wilhelm Ludwig Müller, for "Improvements in water-closets."
- 20782. Gustav Schulze, for "Improvements in roofing tiles and in apparatus for manufacturing same."

To INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. KAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of *Contracts Open, Tenders, &c.*, it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.

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CONTRACTS OPEN.

ABERDARE.—Nov. 26.—For Building Thirty-three Houses. Mr. C. H. Elford, Architect, 34 Canon Street, Aberdare.

ABERDOVEY.—Dec. 6.—For Works of Sewerage and Water Supply. Mr. Morgan W. Davies, Engineer, 17 Adelaide Street, Swansea.

ANERLEY.—Dec. 1.—For Erection of Weather Screen at District School. Mr. H. J. Chaldecott, Clerk to Managers, North Surrey District School, Anerley.

ANERLEY.—Dec. 1.—For Making-up and Metalling about 200 Feet of Entrance Road at North Surrey District Schools. Mr. H. J. Chaldecott.

BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BELFAST.—Nov. 24.—For Extension of Covered Market and Building New Fish Market. The City Surveyor.

BOSCASTLE.—Nov. 28.—For Additions to Board Schools. Mr. Otho B. Peter, Architect, Launceston.

CAVERSWALL.—Nov. 27.—For Enlarging Board Schools. Mr. T. P. Hulse, Architect, Longton, Staffs.

CHESTERFIELD.—Nov. 24.—For Building Pair of Semi-detached Villas. Mr. W. H. Wagstaff, Architect, 57 Saltergate, Chesterfield.

CITY OF LONDON.—Nov. 23.—For Construction of New Commissioners' Office in Basinghall Street. Mr. Henry Blake, Guildhall.

CROMER.—Nov. 23.—For Retiring Room to Court House at Police Station. Mr. T. H. B. Heslop, County Surveyor, Norwich.

DONCASTER.—Nov. 29.—For Building Schools. The Borough Surveyor, 3 Priory Place, Doncaster.

DOWNPATRICK.—Nov. 24.—For Lavatories for Workhouse. Mr. J. W. Montgomery, Clerk, Poor Law Office, Downpatrick.

EAST ASHFORD.—Dec. 1.—For Execution of Works of Drainage and Sewerage. Mr. Alfred J. Burrows, F.S.I., 41 Bank Street, Ashford.

EXETER.—Nov. 30.—For Reconstructing Drains, Painting and General Repairs, Larkbeare House. Mr. E. H. Harbottle, County Surveyor, Exeter.

FAREHAM.—Nov. 23.—For Tank and Tankhouse, Water Mains, Hydrants, Sluices, &c. Mr. Walter Butler, Surveyor to the Local Board, Fareham.

FARNBOROUGH.—Dec. 1.—For Building Police Station. Mr. James Robinson, County Surveyor, 13 Southgate Street, Winchester.

FIRTH OF CLYDE.—Dec. 6.—For Construction of Pier at Ardeer, Stevenston. Messrs. Crouch & Hogg, 175 Hope Street, Glasgow.

GLASGOW.—Dec. 6.—For Supply of Granite and Whin Paving Stones, Crossings and Channels. Mr. Whyte, Master of Works, City Office, Glasgow.

GLASGOW.—Dec. 8.—For Works in Erection of Hospital for Infectious Diseases, Ruchill. The City Engineer, 64 Cochran Street, Glasgow.

HARROGATE.—Nov. 27.—For Building Retort House. Mr. George Sayner, Manager, Gasworks, Harrogate.

KINGSTON.—Dec. 1.—For Boundary Walls and Oak Fence, &c., for Burial Board. Mr. E. Carter, Surveyor, 55 Clarence Street, Kingston-on-Thames.

KINGTON.—Dec. 7.—For Erection of Girls and Infants' Schools and Mistresses' Residences. Mr. J. E. Goodacre, Dunfield, Kington.

LEICESTER.—Nov. 26.—For Constructing Shelter at Recreation Grounds. Mr. E. G. Mawbey, Borough Surveyor.

LONDON.—Nov. 26.—For Supply during 1895 of Timber English and Foreign; Ironmongery, Saddler's, Coach, Engineer's, &c.; Axles and Springs, White Lead, Glass, Grease, Indiarubber and Sundries, Coach Trimmings, Canvas, Sacks and Horsecloths, Leather, Basils, Backs, Bulls, Mill Bands, &c., Brushes and Brooms, Coal and Coke, Building Materials, Gas and Water Fittings. Mr. R. T. Kingham, London General Omnibus Company, 6 Finsbury Square, E.C.

MENSTON.—Nov. 23.—For Building Country House. Messrs. H. & E. Marten, Architects, 5 Charles Street, Bradford.

PENTRE.—Nov. 30.—For Building Infants' School. Mr. J. E. Lash, Architect, 5 Temple Row, Wrexham.

PORTREATH.—Nov. 24.—For Infants' School, &c. Mr. S. Hill, Architect, Redruth.

QUEENSBURY.—Nov. 24.—For Building Local Board Offices, Surveyor's House, Stabling, Mortuary, Fire Brigade Station, &c. Mr. John Drake, Architect, Winterbank, Queensbury.

SEELY OAK.—Dec. 11.—For Building Infirmary. Mr. D. Arkell, Architects, Temple Row West, Birmingham.

SPAIN.—Nov. 30.—For Construction of Dock (70,000l.) at San Stephen's, Provia. Plans, &c., at the Ministry, Madrid, and at Department of Public Works, Oviedo.

THORNBOROUGH.—Dec. 3.—For Building Board School, &c. Messrs. George Bennett & Sons, Market Hill, Buckingham.

TREGONV.—Nov. 24.—For Restoring Boscawen Almshouses. Mr. Silvanus Treyail, Architect, Lemon Street, Truro.

ULVERSTON.—Dec. 15.—For Infant School. Messrs. J. W. Grundy & Sons, Brogden Street, Ulverston.

WALTHAMSTOW.—Nov. 27.—For Erection of an Additional Classroom at Markhouse Road Boys' School. Mr. W. A. Longmore, F.R.I.B.A., 7 Great Alie Street, Whitechapel.

WEST MOORS.—Nov. 30.—For Building Curatage. Messrs. Adye & Adye, Architects, Town Hall Chambers, Bradford-on-Avon.

WOLVERHAMPTON.—Nov. 30.—For Erection of a Post Office. Mr. H. W. Primrose, H.M. Office of Works, 12 Whitehall Place.

TENDERS.

BANGOR.

For Construction of a Pier and Landing-stage at Garth Point, for the Corporation. Mr. JOHN J. WEBSTER, Engineer, 39 Victoria Street, Westminster.

Head, Wrightson & Co., Victoria Street	£26,779	18	0
Handysides & Co., Derby	19,759	16	3
Thames Ironworks Co., Limited, Blackwall	19,758	0	0
Heenan & Froude, Manchester	17,805	0	0
Arrol Bros., Glasgow	17,623	10	9
H. Woodhouse, Garston	16,550	0	0
Godfrey & Co., Victoria Street	16,333	15	1
Cleveland Bridge Co., Darlington	16,185	0	0
Tees Side Iron and Engine Works, London	16,130	12	10
J. Butler & Co., Leeds	15,969	0	0
Pearson & Knowles Coal and Iron Co., Warrington	15,920	0	0
T. Gibson, Victoria Street	15,612	6	9
Mayoh Bros., Manchester	15,500	0	0
De Winton, Carnarvon	15,472	0	0
Murdoch & Cameron, Glasgow	14,830	0	0
G. Lawson, Glasgow	14,752	0	0
A. THORNE, Victoria Street (accepted)	14,475	0	0

BELFAST.

For Works in Connection with New National Bank, &c., Belfast. Mr. WILLIAM BATT, Architect, Garfield Chambers, Belfast.

Accepted Tenders.

J. Dowling, Belfast, internal plumbing and gas-piping	£215	10	0
Laing, Wharton & Down, London, electric wiring, switches, &c. (exclusive of fittings)	196	10	0

BIERTON.

For Rebuilding Eagle Tavern, Bierton, near Aylesbury, for Mr. J. H. Goodey. Mr. W. F. TAYLOR, Architect, Aylesbury.

J. S. Holland, Wendover	£532	0	0
Mayne & Son, Aylesbury	517	0	0
Hill & Bonham, Bierton	497	16	3
Jewell & Paradise, Aylesbury	477	10	0
H. H. Sherwin, Waddesdon	458	15	0
S. Grist, Bierton	418	0	0
H. T. Grimsdale, Aylesbury	417	10	0
W. H. Siarey, Kingston	399	0	0
WALLIS & Son, Chesham (accepted)	365	0	0

BOURNEMOUTH.

For Making-up Grosvenor Road, &c. Mr. F. W. LACEY, Borough Surveyor.

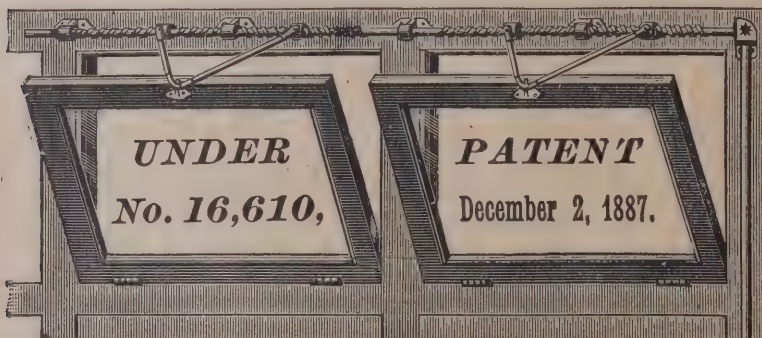
F. Hoare & Sons	£1,439	10	0
W. H. Saunders & Co.	1,404	2	11
G. TROKE (accepted)	1,321	5	4
Surveyor's estimate	1,235	0	0

South and other Roads.

S. Saunders & Co.	605	5	7
W. H. Saunders & Co.	599	19	7
G. TROKE (accepted)	572	10	7
Surveyor's estimate	632	0	0

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G. Troke	220	9	11
S. SAUNDERS & CO. (accepted)	204	7	0
Surveyor's estimate	200	0	0



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T. & J. Nixon, joinery	220	10	0
Graham & Crawford, plumbing	205	0	0
R. M. Ormerod & Sons, plastering	96	0	0
J. Deward, painting and glazing	56	12	10

CARLTON.

For Additional Cellar and Alterations to Carlton Club. Mr. JOSEPH OLDROYD, Architect, Royston, and Infirmary Street, Leeds.

Parkin & Sumers, Carlton	£86	10	0
H. Burrows & Sons, Barnsley	67	15	3
A. J. Straker, Cudworth	64	9	6
C. & E. CUTTS BROS., Royston (accepted)	50	10	0

CRADLEY HEATH.

For Alterations to Infants' School, Cradley Heath, for the Rowley School Board.

COCKIN & SONS, Blackheath (accepted)	£1,218	0	0
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KILWINNING.

For Construction of Hospital on the Lands of Ragside, at the East End of Kilwinning, about half a mile distant from the Glasgow and South-Western Railway and Caledonian Railway Stations there, for the Northern District Committee of the County Council of Ayrshire. Mr. JOHN ARMOUR, Architect, Irvine.

Accepted Tenders.

J. Young, Kilwinning, digger, mason and brickwork	£1,598	13	6
T. Miller & Co., Saltcoats, carpenter and joiner	927	17	2
R. Irvine, Kilwinning, plumber and gasfitter	544	17	3
Ford Bros., Kilmarnock, plasterer	316	11	0
T. Hall, Irvine, slater	292	5	1
T. Hall, Irvine, heating	78	18	2

KIRKCALDY.

For Mason, Joiner, Plumber, Slater and Plaster Works Required in the Erection of Villa at Milton Road, for Mr. Thomas Swan. Mr. ROBERT LITTLE, Architect, Towns-end Place, Kirkcaldy.

Accepted Tenders.

T. & G. Menzies, mason	£662	0	0
J. Wishart, joiner	498	0	0
W. Frew & Sons, plumber	115	0	0
G. Scott, plasterer	1c8	0	0
A. Ferguson, slater	42	0	0

HARROW.

For Alterations and Extensions at Greenhill Board Schools, Harrow, for the Harrow-on-the-Hill with Pinner Board School. Messrs. HOUSTON & HOUSTON, Architects, 13 Furnival's Inn, London, E.C.

Cowley & Drake, Willesden Green	£1,315	0	0
A. Webb, Harrow	1,185	0	0
Jones, Richards & Co., Belgrave Road	1,128	0	0
J. Smith & Sons, South Norwood	1,127	0	0
F. G. Minter, Westminster	1,117	0	0
H. Bachelor, Harrow	1,090	0	0
H. Haynes, Alperton	1,079	0	0
P. V. Winderbank, Balham	1,049	0	0
F. T. Chinchin, Kensal Green	1,042	0	0
Gullett Bros., Wealdstone	1,034	0	0
J. F. Collinson, Teddington	1,008	0	0
J. C. Rackham, Harrow Weald	943	10	0
C. Jackson, Vauxhall Park	826	0	0

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Cowley & Drake	1,345	0	0
A. Webb	1,210	0	0
Jones, Richards & Co.	1,153	0	0
F. G. Minter	1,153	0	0
J. Smith & Sons	1,152	0	0
H. Bachelor	1,110	0	0
H. Haynes	1,104	4	0
P. V. Winderbank	1,077	0	0
F. T. Chinchin	1,066	0	0
Gullett Bros.	1,064	0	0
J. F. Collinson	1,032	0	0
J. C. Rackham	958	10	0
C. JACKSON (accepted)	844	0	0

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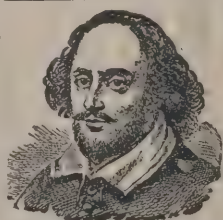
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WOOLPITS, SURREY. FOR SIR HENRY DOULTON.
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PROOFS of this Illustration, which appeared
in "The Architect" on June 6 1885
(now out of print), can be obtained on applica-
tion to the Publisher, price Sixpence each,
post free; on roller, Ninepence.

LONDON.

For Certain Alterations to the House at Bowes Manor, Bowes Park, N., for the Guardians of St. Mary, Islington. Mr. WILLIAM SMITH, Architect, 65 Chancery Lane, W.C.
C. PEEK, Hornsey (*accepted*) £929 0 0

For Kerbing, Channelling and Making-up the following Streets, for the Enfield Local Board, viz. Napier Road, Ponder's End; New Road, Ponder's End; St. James's Road, Enfield Highway; Connop Road, Enfield Wash. Mr. R. COLLINS, Road Surveyor.

Napier Road.

Wadey & Co., Stoke Newington	£639	10	0
Bloomfield, Tottenham	593	2	8
Fry Bros., Greenwich	580	0	0
Jackson, Enfield Town	568	10	0
Griffiths, Kingsland	559	0	0
Nichols, Wood Green	556	0	0
Lee & Son, High Wycombe	540	0	0
Betts, Enfield Highway	525	0	0
LANGDON & CRAWFORD, Old Ford (<i>accepted</i>)	488	0	0
Surveyor's estimate	580	0	0

New Road.

Wadey & Co.	331	0	0
Fry Bros.	305	0	0
Surveyor's estimate	300	0	0
Lee & Son	282	3	5
Bloomfield	277	13	2
Nichols	277	0	0
Sommerfeld	277	0	0
Jackson	273	10	0
Griffiths	269	0	0
Langdon & Crawford	260	0	0
BETTS (<i>accepted</i>)	260	0	0

St. James's Road.

Wadey & Co.	521	0	0
Griffiths	509	0	0
Fry Bros.	496	0	0
Bloomfield	484	4	5
Brown & Co., Enfield Highway	450	0	0
Nichols	449	0	0
Betts	406	0	0
Langdon & Crawford	398	0	0
LEE & SON (<i>accepted</i>)	349	5	0
Surveyor's estimate	486	0	6

LONDON—continued.

Connop Road.

Wadey & Co.	£613	0	0
Brown & Co.	590	0	0
Bloomfield	566	16	9
Langdon & Crawford	565	0	0
Fry Bros.	554	0	0
Lee & Son	528	12	6
Nichols	523	0	0
Betts & Co.	523	0	0
GRIFFITHS (<i>accepted</i>)	519	0	0
Surveyor's estimate	540	0	0

For Works in Additions and Alterations at No. 22 Old Queen Street, St. James's Park, Westminster, S.W., for Mr. Leo. F. Schuster. Mr. A. WILLIAM WEST, Architect, 44B Maddox Street, W. Quantities by Messrs. DUNK & BOUSFIELD, Billiter Square Buildings, E.C.

Colls & Son	£3,650	0	0
Simpson & Son	3,632	0	0
Bush & Sons	3,353	0	0
Holland & Hannen	3,271	0	0

For Sanitary Work and Alterations at 6 Albion Mews West, for Lieutenant Henry Bradshaw, R.N. Mr. CHARLES GRANVILLE BAKER, Architect, 5 Bloomsbury Square, W.C.
W. Blackburn £80 0 0

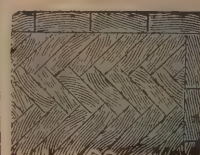
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C. Jenkins & Sons, Porth	£11,060	0	0
Hatherly & Carr, Bristol	9,883	0	0
Williams & James, Pontypridd	9,500	0	0
A. Seaton, Pontypridd	9,113	7	9
J. Allan, Cardiff	9,015	7	7
T. D. Ridley, East Moors, Cardiff	8,790	0	0
J. Byrom, Woolfold, Bury	8,283	0	0
W. IVES & Co., Gateland Works, Shipley, Leeds (<i>accepted</i>)	8,220	0	0

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Fleming & Ferguson, Paisley	2,200	0	0
Willoughby Bros., Plymouth	2,100	0	0
Edwards Bros., North Shields	1,985	0	0
Sir Raylton Dixon & Co., Middlesbrough	1,975	0	0
H. McIntyre & Co., Alloa, N.B.	1,925	0	0
East Ferry Road Engineering Co., Limited, Blackwall	1,875	10	0
Napier, Shanks & Co., Glasgow	1,760	0	0
R. Stephenson & Co., Newcastle	1,750	0	0
E. Finch & Co., Limited, Chepstow	1,650	0	0
Ritchie, Graham & Milne, Govan	1,600	0	0
Simons & Co., Renfrew	1,600	0	0
A. W. Robertson & Co., London	1,575	0	0
Morley, Carney & Co., Newport	1,550	0	0
S. L. Frances & Co., Swansea	1,500	0	0
Blyth Shipbuilding Co., Blyth	1,500	0	0
S. H. Morton & Co., Leith	1,494	0	0
Hunter & English, London	1,445	0	0
J. Constant, London	1,400	0	0
E. F. Brown & Co. (per A. Oake), London	1,400	0	0
Palmer's Shipbuilding and Iron Co., Limited, Jarrow-on-Tyne	1,373	0	0
Groom & Arthur, Leith	1,364	0	0
Forrest & Sons, Wyvenhoe (not delivered)	1,225	0	0
Rennie & Co., Greenwich	1,200	0	0
T. A. Walker, Chepstow	1,170	0	0
A. Vang, Copenhagen	1,150	0	0
CRABTREE & Co., Great Yarmouth (accepted)	955	0	0

STRETFORD.

For Sewering (about 200 Yards of 15-Inch and 12-Inch Pipes), Kerbing, Channelling and Macadamising Crossford Street and Lacy Street, Stretford. Mr. JOHN BOWDEN, Surveyor, 14 Ridgefield, Manchester.

Worthington & Pownall, Manchester	£890	0	0
W. Burns, Pendleton	852	14	0
M. Naylor & Sons, Hulme	781	7	0
A. & H. Halse, Winsford	748	9	0
F. Eyre, Sheffield	743	13	6
T. P. Millan, Manchester	721	11	7
G. BOZSON, Ashton-on-Mersey (accepted)	640	0	0

WRAYSBURY.

For Building a House at Wraybury. Messrs. SARGEANT & SON, Architects, Slough.

Grey, Egham	£717	0	0
A. Reavell, Windsor	697	0	0
Beecham & Rowlands, Englefield Green	679	0	0
Bowyer, Slough	630	0	0
Chennells, Chippenham	630	0	0
Halley, Langley	575	0	0
Pither, Windsor	570	0	0
Simmons, Slough	550	0	0
Burfoot, Eton Wick	539	0	0
J. H. R. Atkins, Slough	522	10	0
LAKE, Staines (accepted)	521	0	0

WOOLWICH.

For Rebuilding Premises, 12, 14 and 16 Hare Street, Woolwich, for Mr. G. H. Leavey. Mr. H. H. CHURCH, Architect, William Street, Woolwich. Quantities by Mr. W. WHINCOP, 15 Kyverdale Road, Stoke Newington, N.

Multon & Wallis	£2,969	0	0
T. J. Barden	2,960	0	0
H. Brown	2,897	0	0
J. Chapman	2,854	0	0
Young & Lonsdale	2,850	0	0
E. Proctor	2,845	0	0
H. S. Holloway	2,797	0	0

TRADE NOTES.

THE Unbreakable Pulley and Mill Gearing Company, Limited, have just booked an order for one of their "Gorton" patent gas engines for the planing, sawing and moulding mills of Mr. John Gray, Albion Street, Grimsby.

AN important firm of Atlantic steamship owners, who some time ago introduced the Baird-Thompson improved system of ventilation into the whole of their fleet, are so thoroughly well satisfied with the results obtained, that they are introducing it into several new ships they are at present building, and have accordingly placed the contract with Messrs. Baird, Thompson & Co., Limited, Ventilating Engineers, London and Glasgow

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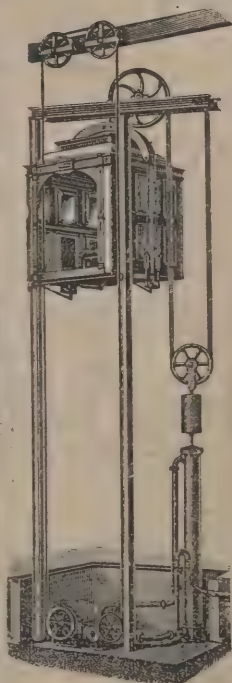
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with instructions to proceed with the work. This of itself speaks volumes for the efficiency of the Baird-Thompson system.

THE new Board Schools, Cardiff, are being warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

A NEW pulpit, the gift of Lady Sykes, has just been added to the Catholic church in Spanish Place. It is designed by Mr. E. Goldie, of Kensington Square, and executed in alabaster with detached Purbeck marble shafts below the floor line. The figures of SS. Paul and John, seated under canopies, divide the body of the pulpit into three equal parts. The interior is lined with cedar and the same material forms a covering to the top of the cornice. With the exception of the metal handrail and gates by Messrs. Hart, Son & Peard, of Wych Street, W.C., the work has been carried out by Messrs. Earp & Hobbs, sculptors, of Lambeth Road, S.E. and Manchester.

WE hear that Rudolph Schwarz, of Vienna, has produced an apparatus by which even those who have never learnt to draw can draw correctly at free hand.

VARIETIES.

WE understand that the directors of the Belfast and County Down Railway Company are inviting competitive designs from architects for the proposed new hotel at Newcastle, co. Down, and offer three prizes of 100*l*., 75*l*., and 50*l*., in accordance with the respective merits, for the best designs. It is intended to expend a sum of 25,000*l*. on the hotel buildings. Mr. Alfred Waterhouse, R.A., is to act as assessor.

THE City Commission of Sewers have decided that the portion of Upper Thames Street between London Bridge and Queen Street is to be paved with Australian wood, at an estimated cost of 2,600*l*.

THE London County Council have given Parliamentary notices of intention to introduce Bills in the forthcoming session authorising them to acquire the undertakings of the eight metropolitan water companies by agreement or arbitration.

THE Dublin Corporation will seek powers next session to make further provision with reference to hoardings for advertising or other purposes, and to prohibit the erection of such hoardings against or in front of any house or private grounds

facing any street or public thoroughfare without the consent of the Corporation.

THE Mersey Docks and Harbour Board at their last meeting unanimously adopted the scheme to provide lairage accommodation for foreign cattle at Seacombe, in place of that at Birkenhead. The scheme involves a cost of 400,000*l*., and will require Parliamentary sanction.

DAMAGE amounting to 150,000*l*. was caused at Nottingham on Saturday by an outbreak of fire in the lace market. Several warehouses were destroyed, and two thousand people thrown out of employment. A curious incident is related by Mr. John Spray, one of the victims of the fire, whose books were preserved in a Milner's safe. The safe was on the second storey when the floor gave way, and was precipitated into the street. On Saturday morning the safe was discovered in its normal condition, save that it was on the bottom storey instead of the second. It had been in the heart of a fiery furnace for ten hours, but on being opened its contents were found to be undamaged.

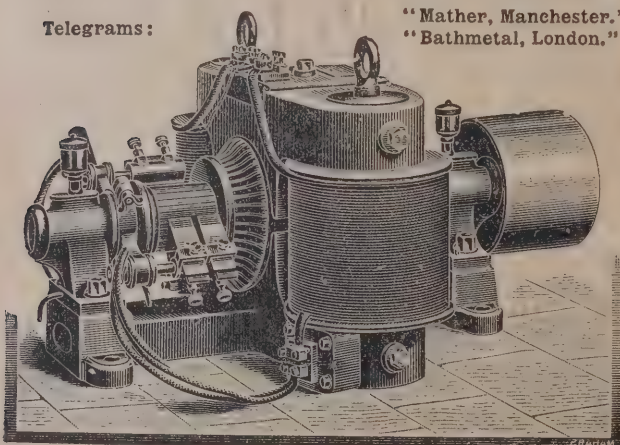
THE Board of Trade have appointed Mr. J. Wolfe Barry, C.B., C.E., Vice-Admiral Sir George Nares and Mr. George Fosbery Lyster, C.E., to be the Commissioners to hold the inquiry directed by that Act as to the improvement of the navigation of the River Thames between Thorney Creek and the Nore lightship. The Commissioners have appointed as their secretary, Mr. R. W. P. Birch, C.E.

It is proposed to erect a hospital for infectious diseases at Thornhill. The Local Board having applied for sanction to borrow 4,000*l*. for the purpose, an inquiry has just been held by the Local Government Board.

THE Leeds Mercury says:—A meeting of the members of the art gallery sub-committee of the free public library committee was held at the Municipal Buildings, Colonel Harding in the chair. What to do with a number of the pictures presented to the committee by the late Alderman George, and which it is found impossible to hang in the Art Gallery, came up for discussion, and it was resolved to recommend the full committee that they should be given back to the family. It is possible, however, that a home for them may be found in some of the branches that exist in the outskirts of the city. The committee gratefully accepted a gift of three pictures by Mr. J. H. Barr, one of their members. They are a portrait of a gentleman, a painting of Calthorpe Oak, by Rhodes, and a seascape from the brush of Leech.

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1866, and December 1873.

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147 STRAND, LONDON, W.C.

THE Barnsley Corporation are about to apply for Parliamentary powers to utilise the sources of the river Rother to construct a new waterworks near Penistone. The Rotherham Corporation will oppose the application.

THE *Glasgow Herald* says:—A gold memorial finger-ring, beautifully chased, and bearing the following inscription, "Lady Mary Boyle, died May 17, 1757," in raised letters round the outside of the hoop, has been found in a field on the farm of Marress, which is situated on the left bank of the Irvine, and within the municipal boundaries. The farm of Marress formed part of the Shewalton estate, sold a few years ago by the present Earl of Glasgow on his succession to the Earldom and the estate of Kelburn. This Lady Mary was probably a daughter of John, second Earl of Glasgow, who died at Kelburn in May 1740, and an aunt of Lord Justice-General Boyle, who was born at Irvine, and died at Shewalton on February 4, 1853, in his eightieth year. The ring would no doubt belong to some member of the Shewalton branch of the Boyle family.

THE Union Steamship Company's twin-screw Royal Mail steamer *Norman*, which left Southampton on Saturday, November 10, with the outward Cape of Good Hope and Natal mails, arrived at Madeira at 5 P.M. on Wednesday, November 14, and proceeded for Cape Town at 7 P.M. Passage three days ten hours, net steaming time. Average speed 15.6 knots per hour. Experienced very heavy weather, steaming slow for twelve hours.

At a recent meeting of the Blackburn gas committee Mr. E. Matthew Lacey was appointed consulting electrical engineer to the Corporation during the erection of the electric lighting installation.

At a meeting of the cement trade held at the London Chamber of Commerce on Tuesday, the 20th inst., it was resolved "That a committee be appointed, with power to engage experts, to investigate into the question of the admixture of Kentish rag stone, other stone or other material with Portland cement so far as carried on at home and on the Continent, and to report and advise thereon. Representatives of the following firms have been appointed upon the committee:—Barron & Co; Burnham Cement Company; Francis & Co., Limited; Gibbs & Co.; Hilton, Anderson, Brooks & Co.; J. C. Johnson & Co.; Lee, Son & Co.; London Portland Cement Company; Tunnel Cement Company; J. B. White & Bros.; and Wouldham Cement Company.

BUILDING AND BUILDERS.

At the meeting of the Edinburgh Dean of Guild Court, a warrant was granted to the Rev. H. J. Wotherspoon for a new hall at Montpelier, which is to take the place for a time of the present iron structure used by the congregation of St. Mark's Church, Morningside. It is intended to build a new church altogether on a spot closely adjoining the hall. The latter building is, however, to be constructed in the form of a church, with a chancel and the usual vestry and organ accommodation. It will be 70 feet long by 31 feet wide, and will seat about four hundred people. The style will be early English, and the building will be constructed of Hailes stone rubble, with red Dumfries stone dressings. It will have an open timber roof with hammer beams and collar beam. The architect is Mr. Henry Kerr, 36 Hanover Street.

At the Dean of Guild Court, Leith, warrants were granted to A. & B. Sutherland to build four semi-detached villas at Rosebank Road, and to the Leith School Board to erect a new swimming bath in connection with Great Junction Street School.

THE complete restoration of Morland Church, near Penrith, is to be undertaken at a cost of nearly 1,500*l.*, exclusive of porch and chancel. The edifice is one of the oldest in the North of England. The Ecclesiastical Commissioners, who are the patrons of the living, have undertaken to restore the chancel, and the porch will be repaired at the cost of Mrs. Markham, Morland House.

PLANS have been prepared by Mr. Sheppard, architect, for increased school accommodation at Droitwich, to be provided by voluntary donations.

THE directors of the Queen's Hotel, Hastings, have just carried out a scheme of decoration and refurnishing. In all, nearly 6,500*l.* has been spent upon the work, and as the hotel possesses a big frontage and occupies an extensive area, the management is now able to offer abundant accommodation to visitors. The whole work of renovation, &c., has been carried out under the superintendence of Mr. Arthur Wells.

THE old parish church of Charlton has been ordered by a faculty to be demolished for the purposes of Corporation improvements at Dover. The site has been occupied by Christian churches for nearly a thousand years, although the present edifice was only erected during the present century.

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NOTES ON NOVELTIES.

AN interesting private demonstration of the capabilities of the Burke automatic wood-turning machine was recently given at 40 and 41 Kirby Street, Hatton Garden, where the machine can now be seen by those interested in the building, cabinet-making and kindred trades. It ably vindicates the character claimed for it by its inventor, Mr. H. J. Burke, turning, as it does, newel posts, porch-columns, balusters, chair and table legs, billiard-table legs, columns and pilasters for cabinet-work, &c. These can, with equal facility, be produced round, square, octagonal, hexagonal or pentagonal, or, say, one-half round and one-half square, concave or convex, in any design or style, and leaving the machine quite finished, thus dispensing with sandpapering or any hand work whatever. A striking feature of the machine is the speed with which it operates; no less than eighty square baluster rails can, for instance, be produced in an hour, irrespective of the elaborateness of the design. Hard woods, such as oak, box or ebony, are as easily manipulated as those of the softest grain, and in fact give, if possible, a better result, as the details work up sharper, and knotty wood gives no more trouble than the cleanest. The machine is practically automatic, and having very few parts, costs very little for maintenance, therefore the work, despite its excellence, can be produced at a very low price. As an instance, in turning an ordinary newel square or octagon, 5 feet long by 6 inches square, in this machine, the cost would not exceed 3*d.*, and a similar article could not be turned by the ordinary methods for less than 1*os.* or 15*s.* Patents are already acquired, or are in course of being acquired, in all countries by the Automatic Turnery Patents Company, Limited, whose prospectus will shortly be issued.

THE SURVEYORS' INSTITUTION.

THE following members, having passed the requisite qualifying examination, have been transferred during the recess from the class of "Professional Associates" to that of "Fellows" of the Institution, viz. :—

Septimus Beven, 56 King Edward Road, Hackney, N.E.; Sidney Crawford Buckland, Windsor, Berks; David Thomas Davies, 11 Serle Street, Lincoln's Inn, W.C.; Herbert Archibald Finn, Sole Street House, near Faversham, Kent; Richard Percival Morris, 44 Inderwick Road, Stroud Green, N.; Samuel Frank Newman, 33 and 34 Savile Row, W.; Christopher Percival Oakley, 10 Waterloo Place, S.W.; James Pain, St. Mary's Street, Ely, Cambridgeshire; Edward John Partridge,

7 Crumpsall Villas, Selwyn Court, Richmond, Surrey; Henry Herbert Robinson, 8 Oxford Mansions, Oxford Circus, W.; John Dougal Roney-Dougal, Northampton; Ernest Allen Stapledon, Bridge Chambers, Bideford, North Devon; Samuel Clifford Tee, 86 Grosvenor Road, Highbury New Park, N.; Frederick Wilson Temple, 27 Sandgate Road, Folkestone, Kent.

FIRES IN THEATRES.*

BEFORE discussing the precautions necessary for prevention, let us inquire briefly into the chief causes of theatre fires and calamities. This study of the causes leading to fires and panics is of the utmost importance, because it enables us to derive therefrom the best practical lessons as to what to do, and what to avoid, to prevent the occurrence of a disaster.

Dr. Choquet, in discussing the causes of theatre fires, divides them into two principal groups, viz. (1) the intentional causes, or incendiarism, and (2) the accidental causes.

Leaving incendiarism from malice or other reason out of consideration, we can distinguish further between :—1. Exterior causes, such as lightning, exposure, dangerous trades carried on in the vicinity of a theatre, bombardment of the city, or riots. 2. Interior causes, viz. (a) on the stage, (b) in the auditorium, (c) in other parts of the house. 3. Mixed causes, such as fires originating in living apartments or in stores, or offices or restaurants under the same roof with the theatre proper. Placed in the order of their frequency, we find theatre fires to have their origin :—

1. On the stage. 2. In the actors' dressing-rooms, in the engine, and boiler-room, in the cellar and in the administrative offices. 3. In stores, offices, living apartments or restaurant kitchens in the theatre. 4. In the auditorium. 5. In outside causes, such as exposure to neighbouring buildings on fire.

In not a few cases the exact cause of a theatre fire remains for ever unknown. This is due largely to the rapidity with which the flames spread among the vast mass of combustible material and to the haste and confusion incident to the fire, particularly when this breaks out during the night time. The best information about causes of theatre fires is derived from those fires which break out during a performance, and which for obvious reasons are the most dangerous and often lead to deplorable calamities.

* From papers by Mr. W. Paul Gerhard, C.E., communicated to the *Scientific American* supplement.



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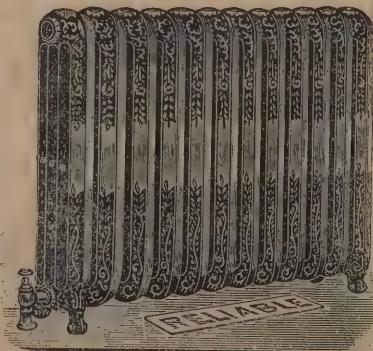
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LEMENT

The majority of fires during performances break out on the stage, and are due to open and unprotected or to deficiently protected lights in too close proximity to or amid a mass of unprotected and highly inflammable scenery, draperies, gauze, ropes and woodwork. Among the numerous other causes I mention the careless lighting of gas lights on the stage by alcohol lamps on long poles, and sometimes defects in the electric spark or flashlight apparatus, causing escapes of gas or gas explosions; carelessness in the use of lamps on the stage or in the dressing-rooms, or exposure of lamps to sudden draughts; careless handling of candle lights in dressing-rooms; alcohol lamps used by actresses for heating hair curling irons in the dressing-rooms; the dropping of sparks from the lighting torches on the stage, or on decorations or papers; temporary gas conduits needed on the stage, generally consisting of rubber tubing, becoming leaky, or not being well jointed together, or becoming otherwise damaged and defective; the use of portable open gas burners near movable scenery; the use of defective gas burners and gas fittings, exposed gas pipes damaged by the shifting or carrying about of heavy pieces of scenery or furniture; main gas pipes becoming leaky and causing escapes of gas; gas explosions in the gasmeter vault or elsewhere; swinging gas brackets setting woodwork or scenery or curtains on fire. Lights other than gas lights are often worse; the upsetting of coal, oil or kerosene lamps, and the explosion of such lamps are fruitful causes of fire.

The electric light finally, although the safest comparatively of all lights, may cause fire by reason of electric-light wires not being properly insulated or being faultily installed.

The careless use of matches, other than safety matches, throwing away of lighted matches, and rats or mice gnawing phosphorus matches in hidden recesses, are among the causes of fires.

The smoking of tobacco, cigars, cigarettes as well as pipes, and the careless throwing away of lighted cigars or cigarettes in dressing-rooms or on the stage or in the sub-basement, the careless use of the oxyhydrogen or limelight, the use of fire-works in spectacular plays calculated to attract the public, the use of red fires, torches, Roman candles, the firing of rockets, are dangerous causes of fire, because a spark often lodges amid scenery, and the flames break out during the night following the performance. Sometimes fire-works are prepared for the play in the theatre building, which is a pernicious practice. The representation of fire or conflagrations or actual explosions in the course

of the play, the firing of firearms, pistols or guns, with paper wads; the careless handling and use of benzine or turpentine in workshops and costume-rooms. The heating apparatus, particularly stoves and furnaces when overheated during extreme cold weather, defective flues, timber near woodwork; floor registers and heat flues, hot ashes, the use of straw or hay on the stage, the careless use of soldering furnaces on tin theatre roofs, gauze dresses of ballet dancers catching fire and in turn setting decorations on fire, non-removal of rubbish and trade refuse; and accumulation of large masses of combustible material, woodwork, canvas, gauze, pasteboard, hemp ropes, paper with varnish, so-called properties, &c., on the stage; the use of rooms in the theatre, in the basement, or in the loft over the auditorium, or even of the stage, as paint or carpenter's shop; the spontaneous combustion of heaps of waste material of oily rags used for cleaning lamps, or in engine or dynamo room; the action of rays of the sun concentrated by window-glass or lenses; carelessness in the necessary quick moving or shifting of inflammable scenery near the innumerable gas-lights; the drying up of woodwork on the stage by the heat due to the numerous lights.

As indirect causes of fire, I may lastly mention an undesirable site, the danger from contiguous or adjacent houses and property, the bad arrangement of the plan, the use of bad materials in construction, defective general system of construction without division into separate fire risks; the misuse of a part of the premises, as living or sleeping apartments, as kitchens for restaurants, or for dangerous trades or stores; the want of proper fire appliances and of a fire watch; the absence of fire alarm telegraphs, or delays in sending the alarm; frequent changes of watchmen, fire watch and stage hands, and the fact that even men occupying responsible positions grow careless after long time.

The danger of fire in a theatre is also, to some extent, dependent upon the character of the play, whether the plain comedy or drama, or the more elaborate opera, ballet or spectacular play; the arrangement and size of the stage, the method of lighting used (incandescent electric lights being without doubt the safest to use), and the age of the building, the first five years being, as found by experience, among the most dangerous.

Causes of Panics.

Panics may occur in any place of assembly where large crowds of people are congregated, even when there is no out-

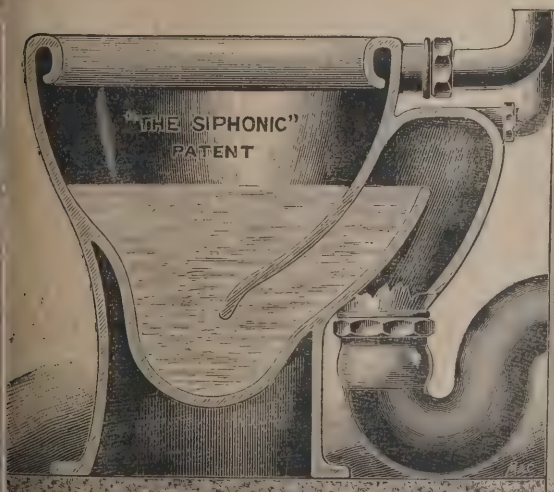
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break of fire, and sometimes very trifling causes may create terrible panics. It is in many respects much more difficult to prevent a panic in a theatre than a fire, and, what is worse, panics may become quite as dangerous in fireproof buildings as in those of a combustible nature.

The immediate causes of a panic may be a sudden outbreak of fire; a false cry of "Fire!" the false alarm being given either by some excited or frightened, foolish person in the audience, or sometimes intentionally, as, for instance, by pickpockets; a sudden commotion on the stage or in the audience; the sudden appearance of smoke on the stage from burnt fireworks or otherwise; the unannounced darkening of the house; a sudden extra pressure of gas at the footlights, causing the flames to flare up unduly; the sudden extinguishment of the electric light; a fire alarm in the neighbourhood, or even only the rattling noise of passing fire-engines; the reflection of a fire in the neighbourhood of the theatre; a thunderstorm or stroke of lightning; persons fainting in the theatre; horses on the stage becoming frightened and shying, or falling into the orchestra pit, and others.

Features in the construction and arrangement of a theatre which may indirectly lead to a panic are too few exits, various exit passages crossing each other, obstructed aisles or corridors, too narrow stairs, winding stairs, doors opening inward, doors opening in dark corridors and safety exits kept under lock and key.

The best way to prevent panics is to give to the theatre-goers a feeling of security by planning a very ample number of wide exits, so as to enable the quick and quiet emptying of the house, by arranging easy stairs, by providing at least two separate stairs for each of the tiers, by arranging a larger number of stairs for the visitors in the gallery, by installing the electric light in the theatre, particularly on the stage, and providing also auxiliary lights in the corridors, stairs and exits.

Furthermore, by making it known to the theatre-goers that safety appliances are provided in abundance, chief among these being large stage ventilators, a fireproof curtain, fire walls dividing the stage and the auditorium, the fireproof treatment of scenery and of woodwork on the stage, also the putting up and keeping in readiness for instant use in an emergency of plenty of fire-extinguishing and life-saving appliances, including an automatic sprinkler system on the stage, which must be kept in good working order. Finally, by informing the public that a strict fire watch is kept, that the theatre is frequently inspected,

and by issuing and publishing stringent regulations referring to theatre management.

Dangerous to Human Life.

To further understand correctly the subject of theatre-fire catastrophes, let us consider briefly the various ways in which human life is endangered in a theatre fire or panic.

At the outset I will state that it is an error to suppose that the flames are the chief cause of death in theatre-fire catastrophes. The lessons of all theatre calamities point to the fact that it is not the fire, but the smoke, the fire gases and the intense heat incident to the fire, and, on the other hand, the mad rush in a panic, which kill most people. Indeed, the majority of people, particularly in the upper galleries, are suffocated or trampled to death before the fire reaches them. In many of the theatre conflagrations the bodies of victims were found perfectly intact, and either in a sitting position or else fallen upon the floor dead, without the flames ever having reached them.

The lives of people in theatres, whether spectators, actors, musicians, chorus singers, ballet girls or stage hands, are, therefore, endangered:—

(1) By smoke, fire gases, heat, asphyxia, exhaustion; (2) by fire burns; (3) by jams, knocking over, falling down stairs, trampling, crush; (4) by direct shock or fright; (5) by accidents, such as the falling of the central chandelier.

These various causes may result in (a) almost instantaneous death; (b) mortal injuries; (c) injuries resulting in permanent bodily disablement; (d) temporary illness and recovery.

The long list of theatres destroyed by fires breaking out during a performance and the numerous instances of fires breaking out during these hours, but which are put out before spreading, are proof sufficient that the dangers spoken of are constantly threatening the theatre-going public.

To sum up, chief among the causes to which serious calamities are due are open lights and inflammable scenery; defects in gas lighting and gas piping; defective gas lamps; faulty construction of the building, deficient exits and absence of a fireproof curtain, or where same is provided, curtain not used or out of order, absence of fire-extinguishing appliances or lack of water under fire pressure; auxiliary lights in corridors, exits and stairs not provided, absence of smoke ventilator over the stage, accumulation of inflammable scenery and bad management in the theatre.

(To be continued.)

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INSTITUTION OF JUNIOR ENGINEERS.

THE opening meeting of the fourteenth session of the Institution of Junior Engineers was held at the Westminster Palace Hotel. The retiring president, Mr. John Wolfe Barry, C.B., the engineer of the Tower Bridge, took the chair. His successor, Mr. Alexander Siemens, M.Inst.C.E., delivered a presidential address. In the course of this he said that few works of any importance could be carried out by the civil engineer without circumstances occurring which compelled him to exercise his ingenuity in suitably modifying his methods. Another factor which operated in a similar way was the constant development of new requirements in the course of the progress of civilisation. Every novelty introduced brought in its train a fresh set of requirements, which made a demand on the resources and the versatility of the engineering mind. Those problems constituted, in fact, one of the principal attractions of the engineering profession, and, in his opinion, entitled it to be considered as the profession most in keeping with the injunction that man should make nature subservient to him. When they looked round, and saw how the civil engineer had transformed the conditions of living during the last hundred years, they could not help being impressed with the change that had been brought about, and nothing was more natural than the thought that a further development of resources and an increased command over natural forces were in store for them and only waited for the right man to reveal them to mankind. Generally they might say that in order to approach a problem with the most certain prospect of success,

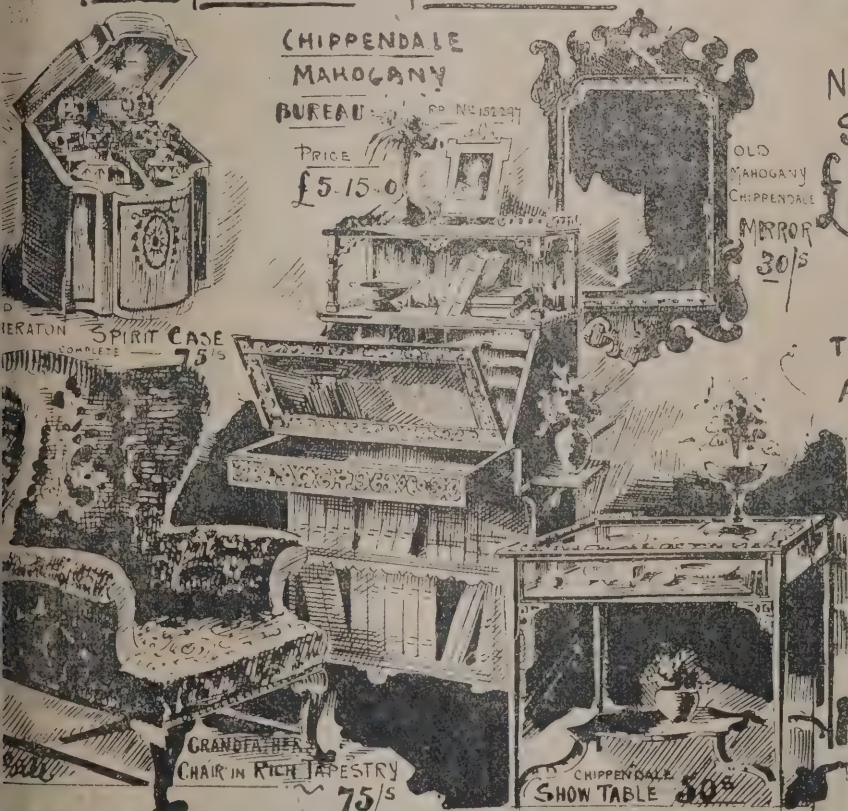
it was necessary (1) to define as accurately as possible the want that existed, or the particular object that was to be attained; (2) to be well acquainted with the scientific principles which came into play; (3) to know how the want was met, or the object attained in practical life; (4) to find out what proposals had been made by others in the same or in a similar case. A careful attention to these requirements would prevent much disappointment and waste of energy. His object that night was not to hold up to ridicule the endeavours of people who might be mistaken, who worked hard enough and earnestly enough in many instances to deserve a better fate, but to impress upon his hearers the necessity of making themselves thoroughly acquainted both with natural laws and existing practice.

SOCIETY OF ARTS.

THE opening address of the session of this society was delivered by Sir John Donnelly, who in the course of an exhaustive review of the past work of the Society dealt with the educational influence exercised by it upon technical education in this country. Interesting reminiscences were given of famous men who had been connected with the Society in its early years. Goldsmith was an unsuccessful candidate for the secretaryship, and the only speech Dr. Johnson is said to have made on his legs was delivered in the meeting-room of the Society. The lecturer described some of the figures in Barry's fine frescoes which adorn the walls of the theatre, pointing out that in the one representing "The Thames" the portraits included those of the Earl of Chatham (representing Neptune), Drake and Captain Cook. Dealing, in conclusion, with the Technical Instruction Act, he said that for the year 1893-94 a total of almost exactly 626,000*l.* was provided in England alone for technical instruction, independent of the grant from the Science and Arts Department. That showed that the operations of the Science and Art Department, the Society of Arts, the City and Guilds of London Institute, and other bodies which had previously been engaged in the movement had not been unfruitful. But unquestionably a great danger lurked around a sudden outburst of zeal of this kind. How far had

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the public generally been convinced of the efficacy of science and art and technical instruction, and the advantage of spending all this money on it rather than in relief of rates? How soon would the pendulum of public opinion, which had been so suddenly and so severely forced in one direction, swing back again? Or—a still greater danger—how soon would the critic, the cynic, and the “practical” man commence their innings by asking to have the account balanced and the profit shown? There were constantly violent fluctuations of opinion on the subject. Every now and then was heard a great outcry against the Royal Academy and its schools or South Kensington and its “system.” And if South Kensington now, why not, in a few years hence, the technical schools and courses of instruction which were being set up with so much care and thought in all parts of the country? He was sure this danger was already felt by many who were interested in technical instruction. The Science and Art Department could always point to the fact that if its science teaching was wrong, it erred in good company, for the syllabuses were prepared and the examinations were conducted by some of the most eminent men of science of the day. If its art training was wrong, it was that which had been laid down by some of the most accomplished artists of the day: it was watched and reported on by such from year to year, and the so-called “system” was, for the matter of that, no invention of South Kensington, but the plan on which artists had been taught their trade from time immemorial. But to whom could the local authorities under the Technical Instruction Act appeal? It seemed to him that, for their own satisfaction and for the future stability of technical instruction, they would desire, instead of remaining as it were isolated and self-contained, to have an influential examining and inspecting board, to which they might refer, if they found it desirable, for assistance and advice. There were at present several bodies partially covering the ground, but only partially, and there was the great disadvantage of a want of unity. This was not the moment to bring forward any detailed scheme. He desired now simply to throw out the suggestion that the Society of Arts, which was at present covering part of the field, should take the initiative in bringing all these bodies together, so that they might form some kind of joint board, or at least co-operate.

The medals awarded for papers read during the previous session were then distributed, and a vote of thanks, moved by Sir R. Webster, Q.C., M.P., and seconded by Sir H. Doulton, was unanimously accorded to Sir John Donnelly for his paper.

BIRKENHEAD BY-LAWS.

SEVERAL cases of infringing the building by-laws were heard recently at the Birkenhead Police Court. Messrs. Jones & Bancroft, 104 Oxtou Road, Birkenhead, had built two houses in Rockybank Road, Higher Tranmere, for which the borough surveyor refused to give certificates of habitation because the bath-rooms were only 8 feet 2 inches in height, instead of 8 feet 6 inches, as provided in the Birkenhead Corporation Acts of 1881 and 1884. The builders appealed against this refusal of the surveyor, and the Corporation summoned the builders of the houses for having let them without first obtaining the certificate. The fact of the bath-rooms being under 8 feet 6 inches was admitted, and the contention of Mr. Knowles for the defendants was that a bath-room was not a “living room,” but the Bench decided against him on the point. He then pleaded, and it was admitted by the Corporation representatives, that ever since the passing of the Act the Corporation had permitted the building of bath-rooms under 8 feet 6 inches, even to as low as 6 feet. Up to the present case not a single complaint or warning had been made against this practice, and in the present instance the Corporation building officials had had every opportunity of measuring the bath-rooms, but had not done anything until the houses were roofed and completed. Mr. Knowles contended that this was a great hardship and unfair to the builders, who had given the Corporation every facility for seeing the rooms for two or three months past. The Bench held that an offence had been committed, and dismissed the appeal. Mr. Jackson said he thought the conduct of the Corporation was scarcely creditable. They had for thirteen years allowed a certain practice to prevail without questioning in any way in the hundreds of houses built, and now they suddenly came down upon these people who had already built their own houses in the same fashion. The Corporation had had every opportunity of measuring the rooms, but had failed to avail themselves of it. The proper method would have been to wait until plans were submitted for new houses, and then give notice to the builders that they were going to enforce the rule which they had hitherto not observed. Mr. Knowles thanked his worship for that expression, which he said he had himself this week conveyed to the road improvement committee in a letter. In each of the two summonses defendants were fined 1s. including costs,

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USK PRIORY, MONMOUTH.

THE interesting old house known as the Priory, Usk, has just been considerably enlarged by the addition of a new wing comprising a large smoking-room with garden entrance, servants' hall and staircase on the ground floor, and additional bedrooms and bath-room on the first floor. The new buildings are domestic Gothic in the Tudor style, stone built and the roof covered with stone shingles obtained from old roofs; the dressings are in St. Aldhelm Box ground stone. The smoking-room is of fine proportions, the ceiling boarded in oak and divided into panels with heavily moulded ribs; an oak panelled dado with handsomely moulded skirting and capping is run around the room and there is a large bay window also ceiled and panelled in oak; the whole of the joinery in this room as well as the floor is in oak, and the fireplace is in character, lined with Godwin's tiles, having a beautiful red forest stone moulded margin and arch, and a large panelled moulded and carved oak mantelpiece. The curious old corridor has also been restored, the "whitewash" cleaned off the old oak beams, the ceiling and dado lined with oak, a handsome oak screen put in between the entrance hall and corridor, and the windows reglazed with lead lights of appropriate character. The whole of the works, including all the oak woodwork, have been carried out in an excellent manner by Messrs. Knox & Wells, contractors, Cardiff, to the designs and under the superintendence of the architects, Messrs. Veall & Sant, of Cardiff, who have supplied full size details for all stonework and joinery. The lead-lights and casements throughout have been supplied by Mr. S. Evans, West Smethwick, the ornamental door furniture and ironmongery by Messrs. T. Brawn & Co., Birmingham; the tiles by Godwin & Sons, Lugwardine Works, Hereford; the grates and electric bells by Messrs. J. Williams & Sons, Cardiff, and the carving both of stone and oak has been most artistically executed by Mr. W. H. Wormleighton, also of Cardiff.

admitted loss, even without charging anything for interest on capital, or making any allowance for depreciation in value of plant and machinery. The tone of the committee's report is apologetic, and properly so. The Chairman of the County Council in his annual address said, in reference to the report of the works committee:—"With regard to the quality of the work done, there are few persons to complain of it. With regard to the cost of such work, some people think that there is more to be said. But are we, as a public body, unwilling to put anything to the credit of quality? Or do we take this position—that while insisting upon quality, we at the same time insist upon cheapness? Now, it seems to me impossible to gain both ends." Of course it is impossible. Every man of business knew that, when members of the County Council were loudly boasting that they were going to oust the contractor, and save his profit of 30 to 50 per cent. But it was in order to effect that saving, and at the same time to pay a high rate of wages, that the works department of the London County Council was established. But, meanwhile, let the public and the ratepayers fully understand this: that while there is absolutely nothing to show that the work has been better done, it is equally certain that it has cost more than if it had been let by contract. The committee report that twenty-eight works completed, or practically completed, during the year ended March 31, 1894, cost 63,046*l*. Twenty-seven of these works cost 54,995*l*, and the "corrected total of estimate" of their cost was 53,370*l*. What was the original estimate is not stated, but it was probably a good deal less. If the work had been let by contract it would most likely have been carried out, taking one job with another, at about 7½ per cent. less than the estimate. The work which the committee did let by contract gave this result, so that it may safely be assumed that these twenty-seven works cost fully 15 per cent. more than the same works, equally well done, would have cost if let by contract. If proper charges were made for interest on the capital employed, and proper allowances for depreciation of plant and machinery, the difference would, of course, be greater. The one work which does show, apparently, a very large saving on the estimate is the Hackney to Holloway storm-relief sewer, which cost 8,050*l*, as against an estimated cost of 12,673*l*. The committee's report does not explain how the great difference in this case is to be accounted for. The New Cross fire station, on the other hand, cost 18,785*l*, whereas the estimate was 15,802*l*.

The estimated cost of the whole twenty-eight works was

THE COUNTY COUNCIL WORKS COMMITTEE.

A CORRESPONDENT of the *Standard* writes:—"The report just issued of the works committee of the London County Council is not satisfactory. Instead of the promised saving of from 30 to 50 per cent., which was constantly referred to as the "contractor's profit," there has been no saving at all, but an



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66,143 $\frac{1}{2}$., and the cost entered against them of 63,046 $\frac{1}{2}$., is something less than 5 per cent. under the estimate. If it had been let by contract the amount expended would, as I have said, probably have been 7 $\frac{1}{2}$ per cent. less than the estimate. But in order to carry out these works and those now in hand, nearly 100,000 $\frac{1}{2}$ of the ratepayers' capital has already been put into the business, and it appears to be intended largely to add to this amount. The site of a wharf has been bought for 39,000 $\frac{1}{2}$., and new workshops, stables and offices are to be completed in nine or twelve months' time, at a cost of which the estimate is not given, but it may be assumed that it will not be less than 20,000 $\frac{1}{2}$., as the foundations alone of the new workshops at the central works are to cost 2,000 $\frac{1}{2}$.. A sum of 20,425 $\frac{1}{2}$ has been expended on plant and machinery, and the stock of materials on hand is taken at 37,166 $\frac{1}{2}$., of which no less than 30,529 $\frac{1}{2}$ is put down as the value of the timber in store. The total sum spent by the works committee up to March 31, 1894, amounted to 206,393 $\frac{1}{2}$.. The average number of workmen employed during the last six months was 1,600 and the amount paid in wages to workmen during the year was 79,704 $\frac{1}{2}$.. With regard to the workmen, the Chairman of the County Council, in his annual address, made significant remarks. "The one danger," he said, "and probably the only danger, which the works committee has to fear—apart from captious criticism, which it can safely refute—is that the workman may not be disposed to do as good work for the Council as for a contractor. . . . It is not improbable that out of 1,700 workmen there may be some who imagine themselves very clever in gaining a temporary advantage by the course I have suggested . . . and I am not quite sure that we have a right to expect from men with 2 $\frac{1}{2}$ or 3 $\frac{1}{2}$ a week a standard that we fail to find in a class with many more advantages." From these remarks it may be gathered that the teaching of the Progressive majority of the County Council has had its effect. It is not cause for surprise if the notion has become widespread among working men that, to get employment at high wages under the County Council, the first requisite is to stand in with the party in power, by promising to "vote Progressive," and that, if only this is done, a man may best advance the great principle of shortening hours of labour by putting in as little work as possible. The less work he does, of course the more men will be wanted.

It would be interesting to examine the accounts of the County Council works committee and to compare the statements of what is called "actual cost" with the original and corrected

estimates. Obviously, for any purpose of fair comparison with work let by contract, interest on the large amount of capital employed and allowances for depreciation of plant and machinery, ought to be charged. Moreover, there appears to be some doubt whether working expenses have been properly debited. The committee's report is "that the debit for establishment charges will now be 7 $\frac{1}{2}$ per cent., as fixed by the Council, but it may have to be modified from time to time, to balance the actual outgoings." The establishment charges last year were at the rate of 9 $\frac{1}{2}$ per cent. The committee admits that "the price at which work can be done by the County Council must always remain a great controlling factor in determining as to whether a work should be let out to contractors; but the committee feel that the quality of the work must be at least of equal importance to the price." Of course it must; but I repeat that there is nothing to show that the quality of the work done by the committee has been better than if it had been done by contractors, and it has certainly cost more.

REGISTRATION OF PLUMBERS.

DR. VACHER presided at a meeting of the Liverpool District Council, at which it was arranged that a number of certificates of registration should be issued at the next meeting. After discussion it was resolved that the Secretary apply to the water and health committee of the Liverpool Corporation to receive a deputation on the subject of printing the lists of authorised plumbers issued by the Corporation, so that the public may recognise the plumbers who are registered by the Worshipful Company of Plumbers, London. It was reported that arrangements had been made to hold an examination for registration on December 1 next at the University College, Liverpool.

A meeting of the Bristol Local District Council was held at the Merchant Venturers' College under the presidency of Professor Wertheimer, B.Sc., B.A. There was a fair attendance of members from Bristol and Bath. The Secretary reported the receipt of twenty-eight handsomely-bound textbooks on plumbers' work and kindred science subjects from the Worshipful Company of Plumbers, to form the nucleus of a library in connection with the local plumbing classes. It was agreed to arrange a Conference of Councils to be held in this city early in February of next year and to include, if possible, representatives from the Birmingham, Cardiff, Portsmouth,

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Plymouth and Swansea Councils, at which the registration system in its relation to the public health will be discussed. The Council received with regret the resignation of Mr. Walter H. Perry as honorary secretary, a position which he has held since the formation of the Council, consequent upon his leaving Bristol to take an official appointment in the health department of the London County Council.

The annual public meeting of Leinster and Connaught District Council was held at Dublin, under the presidency of Mr. D. P. Curtis. The following elections to the District Council for the current year took place:—*Master Plumbers*.—Messrs. W. Baird, L. Brannigan, D. P. Curtis, P. Cooney, P. Dowd, J. Kennedy, W. A. Kelly, T. M. Little, W. B. Morgan, H. M'Nally, J. M'Manus, P. M'Donald, T. M'Lachlan, J. Ring, P. Rydall and T. Watt. *Operative Plumbers*.—Messrs. J. Ballantyne, T. Bedford, T. Baird, A. Bowie, J. Crawford, E. Dunne, R. Doyle, H. Fegan, R. Henderson, J. J. Leech, C. M'Kenzie, A. M'Keown, J. Manzie, A. O'Brien, T. Richardson and W. C. Walsh, the public representatives being elected triennially. The hon. treasurer read the statement of accounts for 1894, which showed a balance in hand to the credit of the District Council. A vote of thanks was tendered to Mr. W. Kaye Parry, M.A., for his valuable services as hon. secretary to the District Council during the past year. The new Council will meet early in December for dealing with applications for registration and making arrangements for examinations.

LIST OF REGISTERED PLUMBERS.

Provincial Masters.

CAMPBELL, T., 13 Cluny Terrace, Buckie, N.B.
COLLINS, E. A., 4 St. John's Place, Monument Road, Birmingham.
CUTHBERT, G., 40 Union Street, Brechin, N.B.
EARNSHAW, W., 15 Stott Street, Nelson, Lancs.
ENTWISTLE, R., 209 Duckworth Street, Darwen, Lancs.
FOULDS, G. H., 21 Stretch Gate Lane, New Pellon, Halifax.
GRUNDY, J., 34 Grove Street, Leamington.
HARGREAVES, S., 184 Howard Street, Burnley.
HOWGATE, W. H., 38 King Street, Wellington, Shropshire.
HUXLEY, T. W., 19 Evesham Road, Stratford-on-Avon.
JACKSON, J., 65 Moor Street, Birmingham.
MCKERRACHER, J., 71 North Street, Bo'ness, N.B.
ROUND, J., Unity Place, Oldbury, near Birmingham.
SEMPLE, J., 25 West Nicolson Street, Edinburgh.
WALKER, J., Markinch, Fife.

And

ROWLANDS, A., 59 Plein Street, Cape Town, South Africa.

Provincial Journeymen.

ALISON, R. W., Inchture, Perthshire.
BLACKLER, J. H., 66 Hoxton Road, Ellacombe, Torquay.
BROWN, J., 21 North Silver Street, Aberdeen.
BROWN, J. H., 79 Clarendon Road, West End, Morecambe.
CHARLES, W. R., 26 Cromwell Road, Plymouth.
CLOAD, C. H., 1 Devonshire Terrace, Highbury Road, Torquay.
COOK, W. J., 18 Turner Street, Birmingham.
CRAVEN, J., 23 Springcliffe, Bradford.
CROSSLY, G. W., 1 Hope Street, Halifax.
CUMPSTY, T., 3 Ashton Road, Lancaster.
CUTHBERT, W., Vains Park, Brechin, N.B.
DILLING, E. R., 62 Well Street, Plymouth.
FEATHERSTONE, E., 14 Hoe Street, Plymouth.
FISH, F. L., 3 Earnsdale Street, Darwen, Lancs.
GOODWIN, T., Causeway Green Road, Langley Green, Oldbury, Birmingham.
GREGORY, H., 78 Hyde Road, Monument Road, Birmingham.
LEE, W. T., 7 Skardon Place, Plymouth.
MINHINNICK, R., 6 John's Street, Plymouth.
NICKS, C. W. A., 3 Belgrave Villas, The Avenue, Torquay.
NIGHTINGALE, H., 22 Highbury Road, Ellacombe, Torquay.
PARKER, E. B., 155 Tong Street, Dudley Hill, Bradford.
POOLLER, J., 27 Friston Street, Ladywood, Birmingham.
RADCLIFFE, W., 12 Westfield Terrace, Pellon Lane, Halifax.
RAPE, W., 7 George's Square, Devonport.
RICHMOND, J., 118 Willis Street, Ashstead, Birmingham.
RINGROSE, C. J., 43 St. Mary's Road, Sheffield.
ROSE, R., Doveridge, Derby.
SMITH, J. H., 12 Bridge Street, Leighton Buzzard.
SUTTON, F., 255 New Spring Street, Birmingham.
TAYLOR, D., 30 Commercial Street, Perth.
WALLSGROVE, R., 2 Landsdowne Street, Leamington.
WALMSLEY, W., 27 Miall Street, Bradford.
WATSON, J., 120A High Street, Dunfermline.
WILTON, A., Stratford Road, Shipston-on-Stour.
WISEMAN, H. L., 2 Burley Place, Henley Street, Sparkbrook, Birmingham.

And

KELLAWAY, E., Parliament House, Cape Town, South Africa.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-seventh annual dinner in aid of the funds of this Institution was held on Thursday, November 15, at Carpenters' Hall, London Wall. Mr. Basil P. Ellis, the president of the Institution, occupied the chair, and was supported by Sir J. Whittaker Ellis, Bart.; Mr. John Aird, M.P.; Mr. Thomas Blashill, F.R.I.B.A.; Mr. N. Smith (master of the Carpenters' Company), Mr. A. Lucas, Mr. F. J. Dove, Mr. J. Randall, Sir W. Pearson, Bart.; Mr. B. E. Nightingale, Mr. H. H. Bartlett, Mr. Howard Colls, Mr. C. Russell, Mr. J. T. Bolding, Mr. J. W. Duffield, Mr. T. Stirling, Mr. W. Shepherd and Mr. T. Hall.

The Chairman gave the toast of "Her Majesty the Queen, the Prince and Princess of Wales, and the rest of the Royal Family."

Sir J. Whittaker Ellis, Bart., gave "The Army, Navy and Auxiliary Forces," Major Brutton responding for the Army and Navy, and Mr. J. T. Bolding (late Middlesex Yeomanry) for the Auxiliary Forces.

Sir W. Pearson, Bart., proposed "The Houses of Parliament," which was replied to by Mr. John Aird, M.P.

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," said it had now been established for nearly half a century, and there was no doubt that during that long period much good had been done by the charity. At the present time the Institution paid pensions to forty-eight persons, all of whom, in consequence of old age or infirmity, were unable to earn their own living. The committee made very careful inquiries before placing anyone on the list for election, and went personally into all these matters. To enable the committee to pay the pensions, an income of certainly not less than 2,000*l.* a year was required. The investments yielded about 650*l.* a year, which was a great help, but still it would be seen from these figures that a considerable part of the income was derived from annual subscriptions and donations. It was generally admitted at the present time that the building trade was depressed, and for that reason, he was sorry to say, some portions of the income of the charity had fallen off, but he hoped with the hearty assistance they had received from all quarters, and which he gratefully desired to acknowledge in the name of the committee, they would manage, notwithstanding their difficulties, to maintain the Institution on a thoroughly satisfactory financial basis. The charity was very carefully managed, they did not run into debt and ask their friends to help them out of the difficulty, but they endeavoured to keep within their income. The trade of a master builder was subject to even greater risks than most trades were. A great item to be considered in making a contract was the question of how much the labour was to cost. It was not generally difficult to state pretty nearly what the material would cost, but the labour was a very open question. He believed those who were his elders would admit that it was more difficult than it was twenty years ago to make an estimate as to what the labour would cost in any particular contract. There was all the more reason then why the Institution should be well supported. Builders might be well up to their work, but through circumstances over which they had no control, it happened from time to time that they lost a great deal of money. As in other trades, the elder men were gradually going out of business and younger men coming in, and he hoped they would do all they could to get the younger men to subscribe to the Institution.

Mr. F. J. Dove, who replied, said he had been asked to do so in the regretted absence of Mr. Plucknett, one of the staunchest friends of the charity. Builders nowadays were so keenly alive to cutting one another's throats that it was a wonder they were not all applicants for the benefits of the Institution.

The President also gave the toast of "The Worshipful Company of Carpenters," to whom they were indebted for the use of the hall in which they were met, and for their handsome donations to the funds.

The Master of the Carpenters' Company replied, and said that the Company took a great deal of interest in this Institution. The company had been deprived of a great many of its old functions, but they were doing their best to promote technical education.

Mr. Howard Colls proposed "The President." Speaking as an ordinary builder, he felt proud they had in the chair that evening a man who really belonged to the higher grade of the trade. The toast was very cordially received, and the Chairman replied.

Mr. H. H. Bartlett gave "The Architects and Surveyors." From remote antiquity arch tecture had been one continued progress onwards and upwards and they could point to works of the present time as being fit to compare with those of the past. The architect's profession was not altogether an easy one. Builders came very much into contact with them, and from his own experience he had nothing to complain of as regards architects generally. The duties of architects and surveyors should be kept separate. The builders were perfectly satisfied with the way in which the London surveyors

conducted their work, holding the balance as they did between the architect and the builder.

Mr. Thomas Blashill, F.R.I.B.A., in replying for "The Architects," said that one very important point in connection with the technical education of the young architect, as laid down by their Institute, was the way in which he should conduct himself towards the builder and his clients. He agreed that the duties of the surveyor were not such as should be undertaken by the architect.

Mr. H. Northcroft said he felt that the quantity surveyors of London were getting into a better position year by year. He believed they were becoming recognised in a greater degree than before, and as the profession grew in importance, London quantities would be used all through the kingdom, the London practice being undoubtedly the best.

Mr. Arthur Lucas proposed "The Vice-Presidents, Committee and Stewards." He bore testimony to the good work done by those gentlemen, and to the exertions of Major Bruton, their energetic secretary. Mr. G. J. Lough replied to the toast.

In the course of the evening subscriptions and donations to the amount of 966*l.* were announced, of which 804*l.* appeared in the President's list. The President further announced that the members of his firm present had agreed to increase their subscriptions so as to make the total amount up to 1,000*l.*

AMATEUR CONTRACTING.

THE following letter from Mr. John Leaning, F.S.I., has appeared in the *Times* :—

The question of religious tests has exercised the minds of the electorate to the exclusion of other important considerations. It is known to many that the London Building Trades Federation has sent a copy of questions to each candidate for election to the School Board for London. One of them is as follows :—"Are you in favour of the Board, where possible, doing their own work direct, and without the intervention of a contractor?"

The following extract from an electoral address may be taken as a type of the avowed opinions of some of the candidates :—

"Labour policy.—I am a trade-unionist, a supporter of trade-union principles, and an opponent of sweating in any department of the Board's work. In the interests of efficiency

and economy I support the direct employment when possible of labour by the Board, and when not possible the employment of those contractors only who pay the trade-union rates of wages and conform to the recognised trade-union hours of labour."

The above fairly expresses the views of those persons who would draw the School Board into a similar course to that adopted by the London County Council.

The use of the word "sweating" in connection with building operations is profoundly absurd. To compare their condition with that of those unfortunates who make shirts for a penny, or who are herded together in close rooms for very long hours, working at starvation wages, is even amusing. A complete absence of hurry at his work is the conspicuous quality of the builder's workman.

The confidence engendered in the workman's mind by the triumphs of the trade unions has made him lazier than ever before. Systematic loitering is common. The labourer with a hod filled with bricks shoots them out again as he hears the first stroke of the dinner hour, and the carpenter driving a nail leaves it half driven. As a consequence work costs much more than it did but a few years ago. Brickwork which cost about 3*l.* per rod for labour often costs 5*l.* and sometimes 8*l.*; other prices are rising in proportion. Moreover, strikes or threats of strikes occur on very small or no provocation.

If the trade unions insisted on a "standard" man as well as a "standard" rate of wages one might be comforted, but the only qualification for membership is the payment of a subscription.

The employment of men by the Board without the intervention of a contractor would aggravate these evils. Moreover, it is well known that no public body which directly employs labour obtains as much work from mechanics as does a private employer. Add to this the fact that directors of labour know that the difference between 5 per cent. profit and 5 per cent. loss on a building contract is dependent almost entirely on the quality of management and supervision, and the value of these forecasts of efficiency and economy may be easily estimated.

All experience contributes to prove that no public body can do work as cheaply as an outside contractor and all the weight of expert opinion is on that side of the question.

The vagaries of the London County Council within the last few years afford a striking warning against this amateur meddling with a trade of which the majority of the members know very little indeed.



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Governed by a clique—glib, astute and energetic, practically nominees of the trade unions—they have succumbed to the seductive dream of the elimination of the middle man. A consideration of the building operations of the London County Council is instructive.

They began by adopting the trade-union hours and rate of wages. Their insistence upon these with their contractors, coupled with an unreasonably stringent set of conditions of building contract, raised the cost of all their works almost immediately.

Their next step was to establish a works department—still on the pretext of economy. This department has existed two years or thereabout, and they have lately issued an official statement of profit and loss on their building operations.

The item in which they specially exult is the construction of a storm relief sewer between Hackney and Holloway. They profess that it cost 8,051*l.* and that a contractor would have charged 12,673*l.* for it. This implies that the contractor would have made 4,622*l.* profit on the work, equal to more than 50 per cent.

So elated are they with this alleged result, that they have discussed the reasonableness of offering to do sewer work for other public bodies.

Other items of their statement show loss; one of the most striking is the New Cross fire station, which was estimated at 15,802*l.* and cost 18,786*l.*, a loss of 2,984*l.*

But I take leave to doubt a statement produced under the known conditions of this one. It is prepared by the Council's servants in its own offices, and those servants are naturally concerned to present the transactions of the Council in their best aspect. The statement is no doubt an exemplary instance of special pleading.

In considering the alleged saving on the sewer, anyone familiar with builders' work will admit the following propositions:—

That the average building contract rarely involves a profit of more than 10 per cent.

That building contracts are often done at 5 per cent, and not seldom, from the want of judgment of the estimator or unforeseen events, end in positive loss.

Taking these principles in conjunction with the fact that no public body gets as much work from the men as a private employer, and that the establishment charges of a public body are inevitably higher, one is led to the conclusion that the statement before mentioned would not bear the examination of

independent building experts, and that the much-talked-of efficiency and economy are a mere phrase to catch the labour vote.

Another question which the ratepayer may naturally ask is whether these experiments in amateur building are a legitimate part of the work which they elected their representatives to do. Surely their functions are limited to the administration of existing laws and regulations, and they very far exceed them when they interfere with long-established and therefore probably venerable economic principles; and it will surely be admitted that the exceptional favour shown to the building trades at the instance of the trades unions is, and must be, at the expense of all other classes.

One may also ask whether it is or not the duty of all public bodies to treat impartially all sections of the population.

In 1870 the more sanguine advocates of the Education Act prophesied that the School Board rate would not exceed 2½*d.* in the pound; it is now nearly a shilling. What it will reach if this building heresy is persevered in, your readers may judge. Its baneful effect upon the building trade is already apparent. The trade unions have done some good work and are well able to take care of themselves, and the truckling of public bodies to their special interests is unjustifiable and inexpedient.

THE NILE RESERVOIRS.

THE correspondent of the *Times* in Cairo, writing on the 18th inst., says:—Mr. W. E. Garstin, C.M.G., Under-Secretary to the Ministry of Public Works, has issued the note which he presented to the Council of Ministers on the 8th inst. upon the proposed modifications in the Assouan dam project, which was approved in principle by the Government last June. That project consisted in the construction of a dam having its crest at the reduced level of 114 metres, which would provide storage for water sufficient for the irrigation of Middle and Lower Egypt during the months when the Nile is low. Many European archaeological societies begged the Government to find some alternative scheme, and protested strongly against this project, involving as it did the submersion of the celebrated Philæ temples, together with a considerable number of important Nubian monuments, for a period of six months each year.

The Ministry, recognising the respect due to the reasons advanced, has endeavoured to reconcile the material interests

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PROOF IMPRESSIONS of the BEAUTIFUL ART PLATES which appeared in the New Year's Double Number of "THE ARCHITECT," and in the Number for January 10, 1890, THE TOILERS OF THE DEEP. Two Tinted Ink Photographs (size 18½ in. by 13½ in.), may now be obtained, price 1*s.* each. Free by post, carefully packed in patent roller, 2*s.* 3*d.*—GILBERT WOOD & CO., 175 STRAND, LONDON, W.C.

of the country with those of science by submitting a modified scheme, which has received the approval of Government, and the question of providing the necessary funds will enter into the coming Budget. This modified scheme consists in the construction of a dam at Assouan having its crest at the reduced level of 106 mètres, or 8 mètres (26 feet) lower than that originally proposed, which will retain water sufficient for either Middle or Lower Egypt, but not for both.

The adoption of this scheme involves a much slower reclamation of the country, but entails the submersion of only a portion of the Philæ island, containing the smaller monuments, which could be protected by special works to be planned in accordance with the wishes of the learned societies, and it leaves the other numerous Nubian monuments untouched, as shown by Mr. Somers Clarke's note on their levels. In order to minimise still further any possible loss to science from the construction of such a vast reservoir, topographical surveys will be made this winter in order to fix the true bearings of the Nubian monuments, and preliminary plans will be executed of all sites, after which the learned societies will be invited to complete the work.

A minute study of the river from Wady Halfa northwards has convinced the irrigation engineers that Assouan presents the only site where the nature of the river bed and the rock formation render it safe to construct a work of such magnitude, and this opinion has been strongly confirmed by Sir Benjamin Baker and Signor Torricelli, two out of the three experts forming the technical commission brought from Europe to advise the Government. At Khaibar, near the third cataract, 150 miles south of Wady Halfa, a favourable site for a dam and reservoir is believed to exist, but no work is possible in that region until the Mahdists are expelled from Dongola, and even if such a dam were made a second would be required further north, nearer the point of delivery of the irrigation water, as otherwise the great waste from infiltration and evaporation would endanger the success of the scheme.

If funds are obtainable, no valid reason seems to exist to delay the commencement of the work, although the final estimates for the modified dam cannot be submitted before next spring. Now that Egypt has made such an immense concession of her material interests in deference to the wishes of European scientists, the latter incur an obligation to contribute substantial aid to the Government in its endeavour to preserve for their benefit relics which possess no interest and but little value for the people of the country.

The urgent necessity which exists for the reservoir is shown by the fact that the Irrigation Department cannot now supply sufficient water for the needs of cultivators. The Nile flood just past presented an exceptional cause for anxiety, for although previous floods have surpassed it in maximum height, it maintained during the critical month of October a level never reached before. During forty-one days it remained above 24 cubits at Cairo without an accident occurring, and the preventive measures involved only a trifling cost. This shows the good results accruing from the work of strengthening the banks which has been carried out during the past few years.

THE IRON TRADE.

At the opening meeting of the session of the West of Scotland Iron and Steel Institute in the Glasgow Technical College, Mr. James Riley, of the Steel Company of Scotland, delivered his inaugural address as president, to which post he had been elected for the third time. Speaking of the advantage of such associations meeting together, he said it was most essential in view of the competition from abroad that they should acquire the fullest knowledge possible of all that tended to the successful and economical prosecution of the varied operations and processes connected with their special branch of industry. The efforts of neighbouring nations in competition had been far too long treated with complaisance and light-hearted disdain, but the day for that had gone past and we were in the midst of a vital struggle, and our supremacy, if not already lost, was tottering. What still remained to us on the score of natural resources and advantages did not counterbalance the advantages our rivals possessed in the greater docility and steadiness of their workmen, as shown in the longer hours the latter worked or the amount of work they performed in a given time and the much smaller wages they received. He was not an alarmist and had not lost faith in his country or his fellow-countrymen; but he did feel, in the present depressed condition of our great industries, and with impressions due to a recent visit to many continental works fresh upon his mind, that it was incumbent upon us to be up and doing to fully qualify ourselves on all points for the contest in which we were engaged. Proceeding, Mr. Riley showed that the foundation of our eminence as a manufacturing country was our abundant and cheap supply of fuel. The waste in bygone years in that

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material had been lamentable, but the vital importance of the cheap supply of fuel was now becoming recognised, and, on the one hand, in the mining industry everything was being done to treat the product of the mines so that the whole of it might be consumed, and, on the other, everything was being done by improved appliances, mechanical and otherwise, to insure the most exhaustive and economical use of fuel. As to the industry with which the Institute was most particularly concerned they heard a great deal of its decadence in Britain, and the relatively greater advance of Germany and Belgium in productive capacity and as exporters of iron and steel. While perhaps they had not done all they might to meet the keenness of the continental opposition, it had been overlooked or ignored that some of this relatively more rapid extension of trade was absolutely unavoidable on our part. By the successful working out of the basic process of steel manufacture, immense advantages were conferred on continental countries to our corresponding detriment.

When that process was discovered in 1881, he stated the probability that continental countries would become formidable rivals to this country in their own and foreign markets, as it would enable them to be independent of supplies of hematite pig-iron from this country. That anticipation had been realised. It might be—he did not aver that such was the case—that in this country they were subject to more rigorous treatment in inspection and testing; but, whatever was the explanation, the fact remained that the basic steel used—and apparently with most satisfactory results—on the Continent and elsewhere largely exceeded that which was produced in this country. A curious phase of matters was that we were importing hundreds of thousands of tons of ore annually for the purpose of making pig-iron from which to produce satisfactory steel, while our own native resources were left comparatively unused. In Cleveland, with millions of tons of ore close at hand, something like half the total of pig-iron was made from imported ores. In regard to the various processes of steel manufacture, he had always maintained the superiority of the open-hearth process for producing regular and uniform results, and if the basic process was to be carried out in such a manner as to win the confidence in its products which was enjoyed by the acid process, it must be on the open-hearth furnace. In the remainder of his address Mr. Riley dealt with the various processes of manufacture, and described some of the most recent improvements in the methods of manufacture in the direction of improving and cheapening the products.

DELAYS IN EXECUTING ORDERS:

AN action was brought at the Widnes County Court before his Honour Judge Shand, by Edwin Wood, builder and contractor, Widnes, to recover 4*l.* damages from the Warrington Slate Company for breach of contract in the delivery of slates. Plaintiff's case was that he ordered from one of the defendants' travellers 2½ "mill" of Velinheli new quarry slates to be delivered on the 12th, 13th and 15th of the same month. No slates coming to hand on the 12th, the plaintiff communicated with the defendants and received a reply to the effect that there had evidently been some misunderstanding on the part of their traveller, and that they would be unable to supply the slates until the arrival of their vessel from Port Dinorwic. The plaintiff had in consequence been compelled to purchase other slates at an increased cost of 4*l.*, hence the present action. The claim was resisted by the defendants, who gave a different version of the terms of the contract. His Honour gave judgment for the plaintiff for 3*l.* os. 6*d.* with costs.

LONDON BOARD SCHOOLS.

IN the annual report of the London School Board it is announced that during the year ended March 25 last the Board were engaged in purchasing interests in 50 sites. This task is carried out by the works committee. In the case of 13 of these sites the land was acquired for erecting new schools or enlarging existing schools, and in the case of the remaining 37 for completing sites previously purchased, for enlarging the playgrounds of existing schools, or for carrying out general improvements to schools. The total expenditure on the sites was 350,363*l.*, with 35,816*l.* costs. The total number of sites for schools which had been or were being purchased at Lady Day last was 435. In the case of 295 of these sites, where the building accounts have been closed, the cost of the land has been accurately ascertained and is set down at 2,321,226*l.*; and as the schools erected upon them provide a total accommodation for 341,756 children, the cost of the sites per head is 6*l.* 15*s.* 1*d.* Fourteen new schools were opened during the year at a total cost (including sites, building and furniture) of 377,278*l.* 17*s.* 8*d.*, or 28*l.* 7*s.* 1*d.* per head, the accommodation being for 13,305. The schools were paid for out of a loan of 400,677*l.*, authorised by the Education Department. Enlargements of twenty-five schools, affording accommodation

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GOLD MEDAL, Inventions Exhibition, 1885.

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for 8,246, were also completed and opened in the twelve months, the tenders for which amounted to 153,907*l*. Tenders were accepted for four new schools, twenty-one enlargements, four new junior mixed schools, and two pupil teachers' schools, and of course there was a large amount of building work in progress. Besides all this, provision is being made for new cookery centres, laundry centres, manual training centres, centres for the instruction of the deaf, a school for special instruction, and centres for the blind. The drainage of all the 430 schools of the Board has been reported upon, and the Board have appointed a sanitary surveyor for the purpose of preparing plans and superintending the drainage and sanitary work required. Much of the work has already been carried out. An event of the year has been the completion of the head offices of the Board on the Victoria Embankment, which include a handsome Board-room and a well-appointed library. Another very desirable step has been taken in the opening of additional school playgrounds on Saturdays and Sundays. Some 207 of these playgrounds are now open on Saturdays and forty-six on Sundays.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THIS Society visited the works of Messrs. Bullivant & Co., in the Isle of Dogs, where the processes of making steel wire cables and ropes, torpedo-catching nets and wire netting is carried on. The members of the Society were taken over the works by one of the partners; they were shown every detail of the manufacture, from the testing of the wires before they are made up into ropes to the testing of a finished heavy cable. The various machines in the cable shop were carefully explained, as was also the process of galvanising the wires. The process of making the torpedo-catching nets was examined, and the excellence of these was a matter of comment by those present, every care in their construction and much forethought in their design being and having been devoted to them. The wire-net making machines were next examined, and they showed much ingenuity in their scheming out; many thousands of miles had been made by them and sent to all parts of the world. The visitors were shown over the various engine-houses and the boiler-house, the contents of which were all of a first-class character. The wire stores were inspected, many hundreds of tons being always kept in hand ready to meet sudden demands. The testing-house in which tests are made by special machines

(designed by a member of the firm) of the finished cables was inspected, and a portion of a 4-inch cable tested to destruction. The machines for testing the wires before they are made into ropes were also in this house, the testing being both for tensile stress and torsion and the method explained.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 21163. Arthur Raymond Tonks, for "Improvements in pins and keys on which they turn in locks."
- 21212. William Zachariah Mocket, for "An improved window-sash holder."
- 21214. Loftus Balfour Moreton and John Stoker, for "Improvements in locks."
- 21217. Jesse Carter, for "Improvements in and relating to stoves or fireplaces and fuel for same."
- 21275. Thomas Henry Vercoe, for "Improvements in and relating to sewers."
- 21280. George Joseph Bowcock, for "An improved combined door latch and lock."
- 21305. Oswald Barker, for "New apparatus for disinfecting water-closets."
- 21308. Thomas Marshall, for "Improvements in window-sashes."
- 21380. Frederick Charles Bryan Robinson, for "An improved means for fastening windows to prevent vibration and noise."
- 21525. Thomas Hanson Lewis, for "An improved paving and flooring block."

TO INVENTORS.—Patents for Inventions, Trade-marks and Designs secured; every assistance given to inventors. Specialists in Building matters. Information free.—Messrs. RAYNER & Co., Patent Agents, 37 Chancery Lane, London, W.C.

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Yours faithfully, JOHN MARSHALL DAY, Registrar and Resident Medical Officer.

THE

Architect and Contract Reporter.

SPECIAL NOTICE TO THE TRADE AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

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CONTRACTS OPEN.

ABERDOVEY.—Dec. 6.—For Works of Sewerage and Water Supply. Mr. Morgan W. Davies, Engineer, 17 Adelaide Street, Swansea.

ANERLEY.—Dec. 1.—For Erection of Weather Screen at District School. Mr. H. J. Chaldecott, Clerk to Managers, North Surrey District School, Anerley.

ANERLEY.—Dec. 1.—For Making-up and Metalling about 200 Feet of Entrance Road at North Surrey District Schools. Mr. H. J. Chaldecott.

BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BARRY DOCK.—Dec. 10.—For Additions to Infant School. Mr. George Thomas, Architect, Queen's Chambers, Cardiff.

BELFAST.—Dec. 4.—For Building Shops, &c. Messrs. E. & J. Byrne, Architects, Belfast.

BELFAST.—Dec. 6.—For New Hospital Buildings. Mr. Henry Seaver, Architect, 128 Royal Avenue, Belfast.

BELVEDERE.—Dec. 10.—For Erection of Sunday Schools and Congregational Church. Mr. Charles Pertwee, A.R.I.B.A., Bank Chambers, Chelmsford.

BETHNAL GREEN.—Dec. 6.—For Supply and Delivery of 100 Lamp Columns. Mr. F. W. Barratt, Vestry Hall, Church Row, Bethnal Green.

BOURNEMOUTH.—Dec. 10.—For Proposed New Destructor Works at Freemantle. Mr. J. Druitt, jun., Municipal Offices, Bournemouth.

BOURNEMOUTH.—For House and Farm Buildings, Bure, and Villas, Highcliffe, Christchurch. Messrs. Lawson & Donkin, Architects, Yelverton Chambers, Bournemouth.

BRENTFORD.—Dec. 4.—For Construction of Brick Culvert. Mr. Nowell Parr, C.E., Clifden House, Boston Road, Brentford.

CARLISLE.—Twelve Houses for Steam Laundry Company. Messrs. Johnstone Bros., Architects, 39 Lowther Street, Carlisle.

CHEPSTOW.—Dec. 8.—Vagrant Wards. Mr. B. Laurence, Architect, Austin Friars Chambers, Newport, Mon.

CROMER.—Dec. 11.—For Construction of a New and Alteration of Existing Approaches to, and the Construction of Concrete Steps at, the Esplanade. Mr. J. C. Miller, M.I.C.E., 264 Gresham House, Old Broad Street, E.C.

EAST ASHFORD.—Dec. 1.—For Execution of Works of Drainage and Sewerage. Mr. Alfred J. Burrows, F.S.I., 41 Bank Street, Ashford.

EXETER.—Nov. 30.—For Reconstructing Drains, Painting and General Repairs, Larkbeare House. Mr. E. H. Harbottle, County Surveyor, Exeter.

FARNBOROUGH.—Dec. 1.—For Building Police Station. Mr. James Robinson, County Surveyor, 13 Southgate Street, Winchester.

FIRTH OF CLYDE.—Dec. 6.—For Construction of Pier at Ardeer, Stevenston. Messrs. Crouch & Hogg, 175 Hope Street, Glasgow.

GILWERN.—Dec. 12.—Extension of Board School. Mr. E. A. Johnson, Architect, Abergavenny.

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FOLKESTONE.—Dec. 5.—For Alterations to Windows and Doorways at Board Schools. Mr. Joseph Gardner, Architect, 2 Cheriton Place, Folkestone.

FOREST HILL.—Dec. 4.—For Kerbing, Tar Paving, Channelling and Metalling at Queen's Road. Surveyor, Board of Works Offices, Catford.

GLASGOW.—Dec. 6.—For Supply of Granite and Whin Paving Stones, Crossings and Channels. Mr. Whyte, Master of Works, City Office, Glasgow.

GLASGOW.—Dec. 8.—For Works in Erection of Hospital for Infectious Diseases, Ruchill. The City Engineer, 64 Cochran Street, Glasgow.

GREAT NORTHERN RAILWAY.—Dec. 8.—For Supply of New and Purchase of Old Stores for Twelve Months. Mr. Martin, Stores Superintendent, Doncaster.

HALIFAX.—Dec. 5.—Additions to Ashfield. Messrs. Petty & Ives, Architects, Waterhouse Street, Halifax.

HORNSEY.—Dec. 6.—For Providing Removable Platform over Swimming-bath. Mr. A. Hessel Tiltman, Architect, 6 John Street, Bedford Row.

ILFRACOMBE.—Dec. 5.—Additions to Manor Hotel. Mr. W. C. Oliver, Architect, Bridge End, Barnstaple.

ISLINGTON.—Dec. 3.—For Supply and Erection of Wrought-iron Railings and Strained Wire Fencing. Mr. J. Patten Barber, Vestry Hall, Upper Street, N.

ISLINGTON.—Dec. 6.—For Construction and Erection of a Removable Floor and Platform over First-class Swimming Bath. Mr. A. Hessel Tiltman, F.R.I.B.A., 6 John Street, Bedford Row.

KESWICK.—Dec. 4.—For Additions to Millfield House. Mr. J. S. Moffat, Architect, 53 Church Street, Whitehaven.

KINGSTON.—Dec. 1.—For Boundary Walls and Oak Fence, &c., for Burial Board. Mr. E. Carter, Surveyor, 55 Clarence Street, Kingston-on-Thames.

KINGTON.—Dec. 7.—For Erection of Girls and Infants' Schools and Mistresses' Residences. Mr. J. E. Goodacre, Dunfield, Kington.

LIDFORD, NEAR BIRMINGHAM.—Dec. 10.—For Building a Chimney Stack at Sewage Works. Mr. Robert Godfrey, A.M.I.C.E., 23 Valentine's Road, King's Heath.

MALVERN WELLS.—Dec. 4.—For Erection of Passenger Station and Inspector's House, for the Great Western Railway. Mr. G. K. Mills, Paddington Station.

MORLEY.—Dec. 10.—For Club Premises and Shops. Mr. J. W. Burrows, Architect, Queen Street, Morley.

PADDINGTON.—Dec. 3.—For Supply of Broken Granite. Surveyor, Vestry Hall, Harrow Road.

PADDINGTON.—Dec. 3.—For Supply of Granite Kerb, York Paving and Granite Cubes. Surveyor, Vestry Hall, Harrow Road.

PENRHILWCEIBER.—Dec. 5.—For Building Board School. Mr. A. O. Evans, Architect, Post Office Chambers, Pontypridd.

PENTRE.—Nov. 30.—For Building Infants' School. Mr. J. E. Lash, Architect, 5 Temple Row, Wrexham.

PLUMSTEAD.—Dec. 13.—For Addition to Vagrants' Ward at Workhouse. Mr. J. O. Cook, 1 Eleanor Road, Woolwich.

SELLY OAK.—Dec. 11.—For Building Infirmary. Mr. D. Arkell, Architects, Temple Row West, Birmingham.

SKIBBEREEN.—Dec. 15.—For Construction of a Reservoir, Filter Beds, River Diversion Pipes, Fountains, Hydrants, Valves, Pipe-laying and Erection of Caretaker's House. Mr. Richard W. Walsh, C.E., 10 South Frederick Street, Dublin.

SOUTH LONDON.—For Erection of Fourteen Seven-roomed Cottages. Mr. E. C. Tompkins, Crofton Park, Brockley.

SPAIN.—Nov. 30.—For Construction of Dock (70,000Z) at San Stephen's, Provia. Plans, &c., at the Ministry, Madrid, and at Department of Public Works, Oviedo.

SYDENHAM.—Dec. 4.—For Kerbing, Tar Paving and Channelling at West Hill. Surveyor, Board of Works Offices, Catford.

THORNBOROUGH.—Dec. 3.—For Building Board School, &c. Messrs. George Bennett & Sons, Market Hill, Buckingham.

TOTTENHAM.—Dec. 4.—For Making-up Ashmount and Cartingford Roads. Mr. P. E. Murphy, 712 High Road, Tottenham.

ULVERSTON.—Dec. 15.—For Infant School. Messrs. J. W. Grundy & Sons, Brogdren Street, Ulverston.

WEST HAM.—Dec. 4.—For Gas Engineering and Fittings for Three Schools in Course of Erection. Messrs. Newman & Jacques, 2 Fen Court, E.C.

WEST MOORS.—Nov. 30.—For Building Curatage. Messrs. Adye & Adye, Architects, Town Hall Chambers, Bradford-on-Avon.

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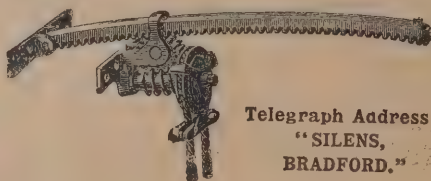
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WOOLWICH.—Dec. 13.—Additions to Vagrant Wards. Mr. J. O. Cook, Architect, 1 Eleanor Road, Woolwich.

WREXHAM.—For Building Mission Hall. Mr. T. C. Williams, Architect, 3 Cable Street, Liverpool.

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HEWINS & GOODHAND, Grimsby (accepted)	4,981 8 0
J. H. Vickers, Nottingham	4,839 7 0

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J. D. Hobbs	1,600 0 0
Thomas & Son	1,500 0 0
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R. G. BURT, Launceston (accepted)	1,360 0 0

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For Reconstruction in Iron of Landing Stage at the Head of Glin Pier, for the Grand Jury of County Limerick. Mr. JOHN HORAN, County Surveyor, 50 George Street, Limerick.

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Murdock & Cameron, Glasgow	2,470 0 0
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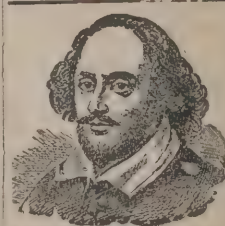
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G. H. & A. BYWATERS & SON (accepted)	268	10	0

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Maguire & Son	352	10	0
Russell & Co.	274	10	0
J. & F. May	267	0	0
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J. F. Clarke & Sons	238	0	0
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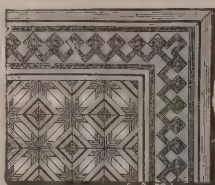
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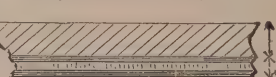
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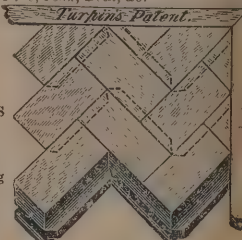


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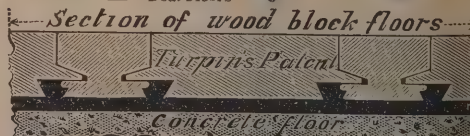
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Russell & Co.	142	10	0
J. Gray	140	0	0
J. & F. May	136	0	0
J. Wontner Smith, Gray & Co.	129	15	0
Z. D. Berry & Sons	124	0	0
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H. Leney	2,312	2	9	26	11	6
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J. Marsland	2,209	0	0	45	0	0
J. Smith & Sons	2,173	0	0	45	0	0
Holliday & Greenwood	2,162	0	0	42	0	0
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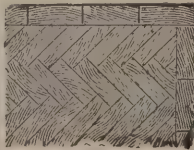
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VARIETIES.

THE *Staffordshire Advertiser* says:—Newcastle-under-Lyne was probably the first town in the county to adopt gas lighting, the original Act of Parliament having been obtained in 1819, or about six years after the new system was adopted in the Metropolis. Want of experience in those early days led to the erection of the works on a level with the greater part of the town, but the concern, primitive as it must have been, was carried on until 1855, when the growth of the town made it necessary for the company to erect new and improved works in a lower situation. These works in their turn supplied the town for nearly forty years, and have just been replaced by the Corporation, who acquired the undertaking in 1880 for 75,000l., with new gas-making apparatus and buildings of the most modern type, capable of dealing with the growing requirements of the district for some years to come.

At the meeting of the Carlisle Architectural Association Mr. F. J. Nickols, of the city surveyor's office, gave an address on the "Housing of the Working Classes," expressing himself in favour of back-to-back houses.

MR. GEORGE PAYNE, F.S.A., delivered a lecture to the members of the Maidstone Philosophical Society on "Roman Pottery and Roman Tiles." He expressed the belief that the pottery makers of the present day based their ideas and did their work upon the principles of the Roman potters, taking their designs in the first instance from the shape and make of the Classic specimens of the potters' art that he exhibited.

At the meeting of the Southgate Local Board it was announced that Mr. V. E. Walker, J.P., of Arncliffe Grove, Southgate, had promised 1,000l. towards the completion of the new Southgate Recreation Ground, provided the Friern Barnet, East Barnet and Southgate Local Boards contribute another 1,000l. between them.

At the meeting of the Govan Dean of Guild Court, Messrs. A. Stewart & Co., Glasgow, were granted lining to erect five tenements of four-apartment dwelling-houses in Paisley Road West.

It is stated that the damage done in Cyprus by the recent floods is estimated at 100,000l.

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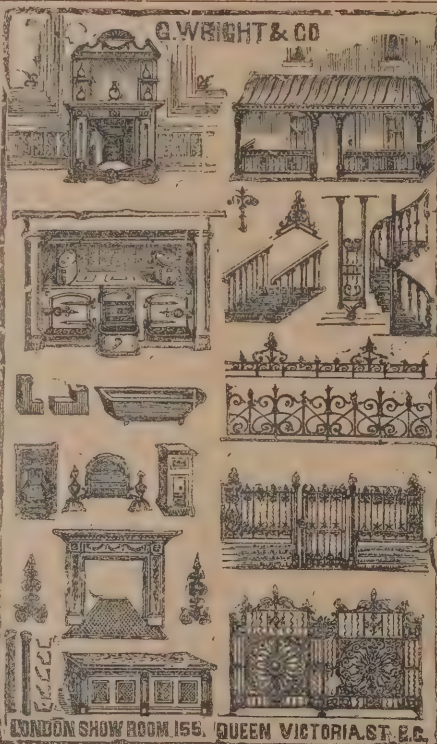
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THE *Leeds Mercury* says that the Governors of the Northallerton Grammar School have received a generous offer of land, at a price much below its real value, from the Ecclesiastical Commissioners, who are the largest landowners in Northallerton and district, and also lords of the manor of Northallerton, for a site on which to build a new Grammar School and playground.

At the Port Glasgow Dean of Guild Court, Mr. Patrick Jamieson, builder, applied for leave to erect two double villas on the ground behind Springhill, Barr's Brae. The plans were approved and permission granted.

At the meeting of the Leeds and Yorkshire Architectural Society, at the Leeds Mechanics' Institute, a paper by Sir George Chubb, on the "History and Development of Locks and Safes," was read by Mr. H. W. Chubb.

THE Manchester Corporation appealed to the Queen's Bench Division against the assessment of the public libraries of the city under schedule A of the Income Tax Act, contending that the libraries came within the exemption contained in the Act in favour of "any building the property of any literary or scientific institution." Justices Wright and Collins decided against the Corporation, whose counsel thereupon said they would have to go to the Court of Appeal.

THE *Birmingham Post* states that the gas committee have resolved to recommend the Birmingham City Council to reduce the price of gas for private purposes by 3d per 1,000, and to make a proportionate reduction on public lighting, as from the next quarterly reading of the meters.

At the meeting of the northern district of the Incorporated Association of Municipal and County Engineers, held in Middlesbrough, Mr. T. W. Stainthorpe, surveyor to the Eston Local Board, read a paper on the River Tees Floating Hospital, which had been built at a cost of 10,000l. The structure was described as the finest floating hospital in the kingdom.

THE cleaning and lighting committee of the Edinburgh Town Council have unanimously approved of Councillor Cameron's motion for the construction of an underground lavatory for men and women in the Grassmarket, and recommended the Town Council accordingly. This is the first one of the kind in the city.

At a special meeting of the Ayr Town Council, a committee was appointed to acquire a site for the electric light works.

THE final disposal of "Constantinople in London" has been effected, Messrs. E. & H. Lumley having sold by auction on the ground at Olympia the electric-light fittings, machinery and miscellaneous effects. Among the machines sold a Crossley Brothers' "Otto" gas engine, 1½ horse-power, 12-inch stroke, brought 26l. The four-turn elliptic turnstiles, which registered 1 to 10,000, by C. Isler & Co, sold at from 3l. 17s. 6d. to 4l. each. The scenery, painted by Messrs. Amable & Gardy, sold as follows:—Scene 1, representing an old English mansion, with village in the distance, brought 15l.; one Spanish scene, 26l.; Vienna, 31l.; the act drop, representing a landing-stage on the Bosphorus, with palaces, 20l.; the panorama of Constantinople and the Golden Horn, 25l.; Roumelia, 45l.; the Slave Market, 10l., and the scene representing the seraglio, palace and coastguard, measuring 3,000 square yards, realised 63l.

THE late Mr. James Kent, contractors, of Coatbridge, who died in last December, directed his trustees, after providing for certain legacies to friends, to divide the residue of his estate in their discretion among religious and charitable institutions in Coatbridge or Glasgow. The sum of 1,727l. has accordingly been distributed without distinction of creed.

BUILDING AND BUILDERS.

PLANS by Messrs. Patman & Fotheringham have been adopted for new farm buildings at East End, Finchley.

At the meeting of the Finchley Local Board, Church End, the tender of Mr. Hawkins, Harringay Park, was accepted for a new mortuary.

THE Carlisle School Board have decided to build a new girls' school on a site in Brook Street.

At a meeting of the governors of the Glasgow and West of Scotland Technical College a minute of the new buildings committee was approved. The minute states that the complete new building scheme involves the expenditure of 100,000l. at least, and that there is urgency in raising 25,000l. as soon as possible, in order to take advantage of the offer of the Bellahouston Trustees to contribute the same amount.

AN addition to the main building of Olympia, 50 feet long by 30 feet wide, is about to be made. It is intended for the exhibition of a moving panorama. It is also proposed to erect a crystal fountain at the south-west angle of the main building.

Telegrams:

"Mather, Manchester."
"Bathmetal, London."

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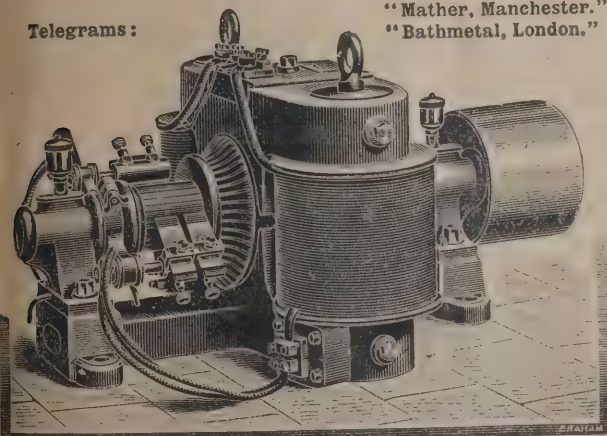
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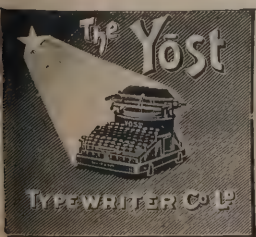
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At Manchester a meeting of Churchmen was held at the Town Hall with the object of promoting the cause of Church secondary schools in general, and in particular of raising a sum of 3,000% towards the building of St. Cuthbert's College, Worksop.

TRADE NOTES:

FOR the ventilation of the Lanark County Hospitals now being erected at Shotts, Stonehouse, Longriggend, and Motherwell, Mr. Alexander Cullen, architect, a large number of the Climax patent direct-acting invisible chimney terminal ventilators and ridge ventilators are being used, and have been supplied by Messrs. Cousland & Mackay, ventilating engineers, of Glasgow and London, the sole manufacturers of these ventilators.

THE Local Government Board have sanctioned the application of the Finchley Local Board to borrow 2,444% for private street improvements.

THE new schools, Nantymoel, are being warmed and ventilated by means of Shorland's patent Manchester grates, stoves and patent exhaust roof ventilators, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

IN Edinburgh Provost McDonald had a meeting with Sir William Arrol in reference to the question of inserting in the contract for the erection of the new North Bridge the clause usual in municipal contracts binding the contractor to the payment of fair or standard wages. Sir William Arrol, it is understood, stated that it would give him great pleasure to insert and sign such a clause.

THE Rhyl Improvement Commissioners at the beginning of the year obtained borrowing powers to the extent of 20,000% to complete the system of town sewerage, and they have now applied for a supplementary loan of 9,286%.

THE Admiralty have decided to remove the Vanguard Shoal in Plymouth Sound, thus greatly improving the entrance to Devonport Dockyard. The work, which will occupy several years, will be commenced at once.

A LOCAL Government inquiry has been held at West Bridgford to consider an application from the Local Board to borrow 5,000% for sewerage purposes. The scheme embraces a new 15-inch iron outfall sewer, a night storage tank, 30 feet deep, a new engine and pumping plant, and improving the present sewage farm by putting in drains and extending

the sewage carriers. The object of the works is to provide for the sanitary wants of a rapidly increasing suburb. The engineer is Mr. W. H. Radford, C.E., of Nottingham, whose scheme was selected in open competition.

STATUES of SS. Mary and John, each about 6 feet high, by Messrs. Earp & Hobbs, of Lambeth Road, Lambeth, S.E., and Manchester, have just been placed in position at All Saints Church, Middlesboro'. They occupy niches on the interior walls of the western end of nave arcades.

GLASGOW NEW CONSERVATIVE CLUB.

THE new Glasgow Conservative Club will be formally opened to-morrow by Sir Edward Clarke, Q.C., M.P. Since 1880 the club has occupied quarters in Renfield Street, but a constantly increasing membership necessitated the finding of new club premises in some part of the city, and an admirable site for them was secured in Bothwell Street at the corner of Wellington Street. Bothwell Street may now be regarded as one of the Glasgow streets of the future, and the Conservative Club adds another to a group of commercial and public buildings ranging along both sides architecturally more imposing than is to be seen in any other thoroughfare in the city. Colonel R. W. Edis, of London, was the architect of the new club, which has cost fully 33,000% apart from the cost of the site. By entrusting the designing of the club to Colonel Edis, the Conservative Club committee placed the work in the hands of an architect who has drawn up the plans for two of the largest clubs in the world—the Constitutional Club in Northumberland Avenue and the Junior Conservative Club in Piccadilly, London, and it is claimed for the new Conservative Club that it is the finest in Scotland. The membership of the Conservative Club is at present 1,200, but the new premises will give accommodation for 2,000.

The new clubhouse occupies a prominent site at the corner of the two streets—Bothwell and Wellington—and the architectural style is a free treatment of the Scottish Renaissance. Owing to the smoke and dirt with which the atmosphere of the Western capital is impregnated, the architect selected red sandstone as the most suitable material for building the structure, and externally he has avoided as far as possible all carving or elaborate work of any kind. But while simple in general treatment, the exterior is not without certain striking features, owing to the arrangement of the fenestration work and the

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crow's-foot gabling, the latter having a flanking of small circular turrets, which gives a picturesque touch to the sky-line. The club-house has a frontage to Bothwell Street of 74 feet and to Wellington Street of 106 feet, and it is backed by a lane running along the full length of the building. From the street level the height of the building is about 90 feet, divided at the front into three principal floors and two upper floors, in addition to the basement, while at the back part of the building eight floors have been obtained by dividing the high flats in mezzanine fashion.

The main entrance is in Bothwell Street, and it has been treated with boldly-carved figure work and granite columns, with a central panel, introducing the arms of the club over the doorway. The outer hall is of small dimensions, but a flight of marble steps, 10 feet wide, leads to the inner hall, which constitutes one of the features of the premises. It is 40 feet long by 24 feet wide, and is arranged with statuary, and divided by Sienna stone columns. A dado of Belgian marble surrounds it, and in the centre there is a magnificent fireplace. From the hall the dining-room, measuring 74 feet by 25 feet, is entered. It has a ceiling height of 20 feet, and the apartment is divided into three by beautifully ornamented Corinthian pillars. The mantelpiece is designed in marbles of different kinds. Huge bay windows flood the room with light by day, and graceful electroliers will supply light by night. Connected with the dining-room there is a very fully-equipped servier. On this floor there is also a large morning-room, and adjoining is a waiting-room for visitors. From the inner hall the grand staircase is ascended, and it is lighted by a series of windows in delicate Grisaille glass with figures of St. Andrew, St. George, St. Patrick, St. David, St. Mungo and St. Tennock—the latter being the old spelling for St. Enoch. The stair railings have also been artistically designed, the wrought-iron work introducing the rose, thistle and shamrock. On the first floor the smoking-room is the principal apartment. It measures 70 feet by 25 feet and has three recess bays facing Wellington Street. The library, a private billiard-room and a committee room, each about 25 feet by 24 feet, are arranged on this floor also. On the second floor the whole of the frontage to Bothwell Street has been utilised for a billiard-room similar in dimensions to the smoking-room and also divided by columns. It has been furnished with three tables. There is also a card-room on this flat and the remainder of the floor space here is set apart for members' bedrooms, of which there are some thirty-five,

and for the club-master's apartments. From this flat the mezzanine floors have been introduced largely. In the upper flats there is ample room for servants' sleeping accommodation, and in the basement servants' day accommodation has been provided, the kitchen—an apartment 44 feet by 25 feet—being also here. Extensive lavatory accommodation has been provided all through the building. A convenient arrangement is that the whole of the service of the club is carried up inside the building connecting with every room, and thus obviating the necessity of servants passing through the halls or principal landings. There is a double service of lifts. The architect has very successfully dealt with the question of giving plenty of light to the various rooms and corridors in the building, and a duplicate system of electric lighting will supply the necessary artificial light.

The contractors for the whole of the building were Messrs. Morrison & Mason, of Glasgow, who in turn sub-let the work to other tradesmen. Mr. J. Woodward was the master of works. The furnishing was done by Messrs. Wylie & Loch-head, of Glasgow, and Messrs. Maple & Co., of London.

COTTAGE HOMES, SHEFFIELD.

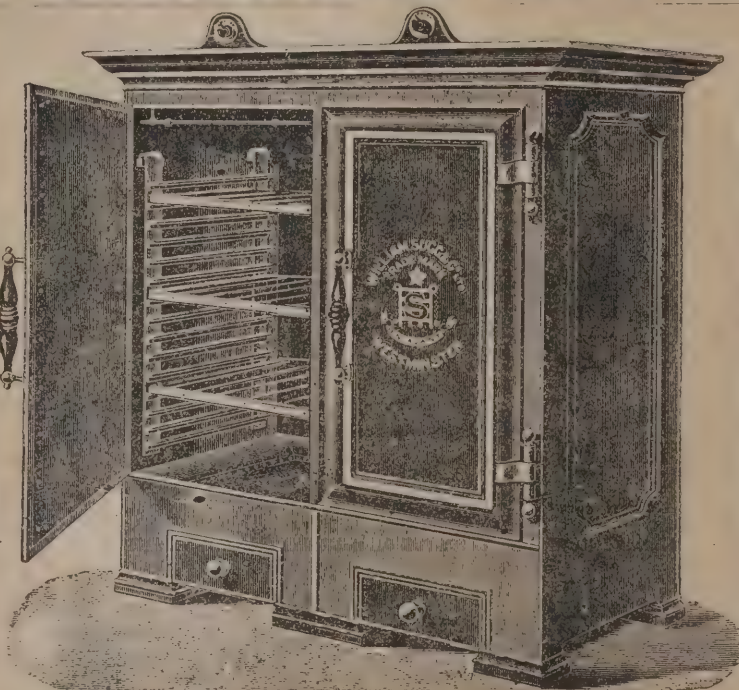
ON Saturday Sir Walter Foster, M.P., opened the new homes for pauper children erected by the Sheffield Poor Law Guardians.

The new buildings are situated on the Goddard Hall estate, in Smilter Lane, Crabtree. The gates opened by Sir Walter adjoin the lodge of the administrative block and receiving home, in which are a spacious waiting room for applicants and parents visiting, medical officer's and examination rooms with bath, sitting rooms for the foster parents, a commodious kitchen, separate dayrooms for boys and girls, lavatories, baths and storerooms. There are separate staircases and dormitories for boys and girls, with a bedroom for the foster parents. Iron escape stairs are placed outside of each dormitory, while across a yard from the girls' side are placed clothes store, washhouse, laundry and disinfecting house, with independent entrance. From the lodge corridor run spacious stores, and on the upper floor is a large and well-lighted office for the superintendent and a commodious committee-room. On the landing of the principal staircase is an ornamental moulded marble tablet, with an inscription recording that the building and the three cottages and hospital on the adjoining land were erected A.D.

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1894, as the headquarters for the Isolated Children's Homes, originated by Mr. John Wycliffe Wilson, J.P., chairman of the Sheffield Board of Guardians. In the same building and over the principal stores is the residence for the superintendent, which is placed so as to effectually command the entrance to the premises from the road and the various buildings. The three detached homes which at present complete the headquarters, and which have been respectively named "Ivy Cottage," "Hawthorne Cottage" and "Rose Cottage," are to the west of the entrance, each having a piece of garden, a playground, a shed and a washhouse. The children's hospital is on the same estate, but approached in a northerly direction from the road between the three cottages and the administrative block. This building is intended ultimately to be connected by a corridor with the administrative block of the general hospital, which will be between it and the workhouse. It is placed nearer the "house" than any other of the children's homes, with the object of rendering available the medical officers and kitchens of the main hospital. All the buildings are purposely simple and most substantial in character. Electric bells are fitted throughout, and the greatest care has been given to the arrangements generally. Mr. C. J. Innocent has been the architect; Messrs. George Longden & Son, Neepsend, the contractors; and Mr. George Malpas, the clerk of works.

WIDENING OF THE STRAND.

THE sanction of the High Court has been obtained to the promotion of a Bill in the ensuing Session of Parliament with reference to the Liberator Building Society's buildings, now in course of completion, between the Strand and the Thames Embankment. Under the powers to be inserted in the Bill Parliament will be asked to authorise a widening of that portion of the Strand facing the Embankment Buildings. The two exact points between which the widening is proposed to be effected are comparatively unknown narrow passages, described upon the plans now being prepared as Ivy Bridge Lane and Carting Lane. The scheme will include the widening of Carting Lane, from the Strand to the rear of the Savoy Theatre, and also the entire discontinuance for public use of Salisbury Street and Cecil Street. The cost of these improvements and the cost of passing this Bill through Parliament are, it is proposed, to be borne by the Liquidator to the Liberator Building Society and J. W. Hobbs & Co., Limited.

ILLUSTRATIONS.

THURLAND CASTLE, KIRKBY LONSDALE

BISHOPSGATE INSTITUTE

NEW PRESBYTERIAN CHURCH, HEATHFIELD ROAD, BIRMINGHAM

ACKWORTH SCHOOL, PONTEFRACT.

To meet modern requirements in the way of technical instruction new workshops have recently been added to the fine block of buildings known as the Society of Friends' School at Ackworth. The school was founded in 1778 by Dr. Fothergill, a well-known London physician, who, with other members of the Society of Friends, purchased the estate and the buildings, which had been erected in 1759 to serve the purpose of a Foundling Hospital. As a hospital the career of the institution was short-lived, and upon the withdrawal of the Government grant in 1773 it had to be closed. The plan of the school consists of a centre and two wings connected by means of quadrant colonnades. It is said that the central block was planned by the Rev. Timothy Lee, D.D., vicar of Ackworth, who had Sir Rowland Winn as his colleague, but it is evident from the detail of the building that assistance must have been given by an architect conversant with the characteristics of Italian architecture. John Smeaton, the celebrated engineer of the Eddystone Lighthouse, is credited with the original arrangement for the water-supply.

In designing the new annexe for technical purposes, care has been taken that it should harmonise as far as possible with the old Georgian buildings. It is a one-storeyed building, 60 feet long by 30 feet wide, one-half of it arranged as a classroom with working-bench for twenty students, and the remaining half fitted up with benches and lathes for leisure hour pursuits. A short corridor connects this latter room with the gymnasium. In height the rooms are 13 feet 6 inches to the plate, and 16 feet 6 inches to the ceiling. The walls are faced with stone from the Ackworth Moor top quarries and lined inside with brick, and the roof is covered with green Tilbert-waite slates. The floors are laid with substantial floor boards on a concrete bed. In addition to the window lighting, additional illumination is provided by means of north roof lights. The rooms are heated by low-pressure hot-water piping. The new extension, which was opened on Thursday, November 22, by Mr. Thomas Pumphrey, of Newcastle, the

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 1, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

SIEMENS' BURNERS, 23 calories per candle per hour.

ARGAND " 44 " " " " "

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14 Palmer Street, Westminster, London.

chairman of the school building committee, has been erected by Mr. John Simpson, of Ackworth, from the designs and under the superintendence of Mr. William H. Thorp, F.R.I.B.A., of 61 Albion Street, Leeds.

REGISTRATION OF PLUMBERS.

AN examination of master and operative plumbers was held on Saturday at Borough Road Polytechnic. Candidates were present from London and the district, and from the following country places:—Eton, Seaford, Southend, Bedford, Harpenden, Weymouth, Newbury, Canterbury, Cambridge, Reading, Bexhill, Gravesend, Hove, Sandwich, Tunbridge Wells, Colchester, Midhurst and Newmarket. The practical tests included lead-bossing, pipe-bending and joint-making. The examination questions included the subjects of roof-covering, contamination of drinking water by faulty connections, arrangement of bath, sink and closet wastes, drainage of town houses, disconnection with sewers. The examiners were Mr. Charles Hudson (chairman of the London Board of Examiners), Mr. W. Titmas, plumber and builder, and Messrs. A. S. Pace and C. Hill, representatives of the United Operative Plumbers' Association of Great Britain and Ireland, Mr. C. T. Millis, superintendent of trade classes. Twenty per cent. of the masters and 25 per cent. of the operatives passed the full examination.

AN examination in the theory and practice of plumbing was held at Cheltenham in connection with the District Council for Bristol and the counties of Gloucester, Somerset and Wilts. The governors of the Technical School kindly placed the premises at the disposal of the committee. Candidates attended from various parts of the district, and were examined in the theory of plumber's work, including house drainage and water supply, and the practical part of the examination was such as to test the candidates in lead-bossing, joint-wiping and pipe-bending. The examiners were Messrs. J. H. Holbrook (master), Bristol; S. Sydenham (master), Bath; T. O. Lloyd (operative), Bristol; S. A. Dowding (operative), Bath; Walter H. Perry, Bristol, honorary secretary; the newly-appointed secretary, Mr. J. W. Holbrook; and Major A. K. Abbot, honorary secretary to the Cheltenham local committee. The report to the central authority recommended that fully 75 per cent. of the candidates be granted certificates, and the examiners were struck with the marked improvement in the work executed, thus showing that the movement is exerting a beneficial influence upon the trade.

FREE CHURCH, MORNINGSIDE, EDINBURGH.

THE present church in Morningside Road, as it now exists, dates back some sixteen years. It had been added to and extended at various times to meet the increasing demands upon its accommodation, and so greatly has the congregation increased under the pastorate of the Rev. Alexander Martin, that the existing building has again been found quite inadequate to accommodate even the seatholders. In view of this drag upon the administration of the church, and the absolute necessity, if its usefulness was to be maintained and extended, of finding somehow the accommodation required for members and adherents, a remit was made to Mr. Hippolyte Blanc, A.R.S.A., Edinburgh, to ascertain if, by any possible extension or reconstruction of the existing building, the extra seats could be procured. Several schemes were drawn out, but each only strengthened the growing conviction that the inadequacy of the site itself was insurmountable, and that by no planning, save the objectionable expedient of double galleries, could the required accommodation be devised. It was then decided to build a new church upon another site, and to continue worshipping in the old church until the new edifice was rendered habitable. The site selected is within a stone's throw of the old building, being situated further south on the opposite side, near the Churchill corner of Morningside Road. Before operations could be begun the site had to be cleared of the villas which then occupied it, and in May 1893 the foundation-stone of the new church was laid by the Rev. Dr. W. C. Smith, Moderator of the Free Church General Assembly for that year, and who preached the dedication sermon. As specially desired by the congregation, the building is designed in a phase of the Renaissance period, with campanile tower at the south-west corner, the building of the upper stages of which it is intended to leave meanwhile in abeyance. The building being surrounded on back and sides by adjoining properties, the respective elevations have been treated in very simple yet effective manner, the distinctive architectural features being confined to the tower and street front. The church is placed at some distance from the street, and the old trees have been allowed to remain untouched. The front boundary will be marked by a low wall, surmounted by an ornamental stone cope and wrought-iron railing of appropriate design. The plan of the church is an elongated rectangle, and it comprises the church area with recessed pulpit platform and organ chamber at one end, with spacious vestibule and staircases at the others. Behind the church is a

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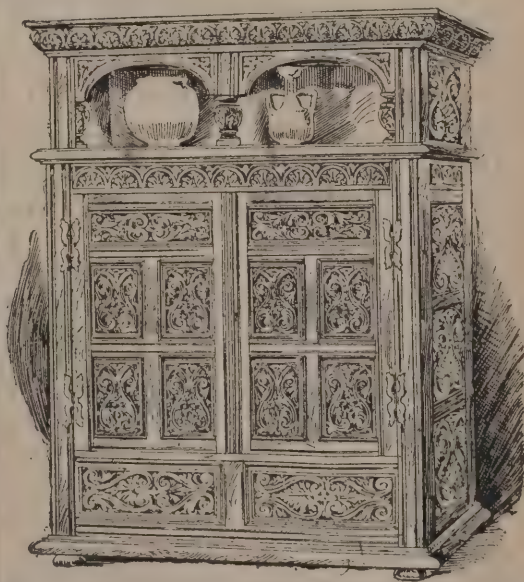
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large hall accommodating 250 persons, classroom for sixty infants, vestry, session-room and soiree kitchen; in an upper floor there is an additional classroom and a caretaker's residence. Towards the street the main building presents a composition of two stages, the lower pierced for three doorways grouped within two massive piers of channelled ashlar-work. The entrance vestibule, which is paved with ceramic tiling in geometric design, measures about 30 feet by 20 feet, and at either end of it are the main stairways leading to the galleries. The interior treatment of the church is somewhat novel and most effective. To keep the interior as light and airy as possible, instead of heavily-projected galleries, those along each side have been projected to an extent to accommodate only a single row of sitters. They are supported upon cantilevers without any pillars, and their shallowness obviates the necessity for windows being placed under them. The back gallery is of normal depth, being extended over the entrance vestibule below. A passage of communication runs behind the sitters in the side galleries, and throughout the church there is an uninterrupted view of the pulpit secured to every sitter. By this mode of construction, moreover, any cold currents of air descending the walls are not felt. Both for the area and gallery floor, heating radiators are placed in wall recesses at regular intervals, which further act against any down currents of air. The pulpit is a most successful design of novel form and is placed slightly off the centre of the platform, that position being occupied by the Communion table. The total accommodation of the church is upwards of 800, the pews for sitters being of the most modern dimensions. The material used for mason-work is red Corsehill stone, for the constructive woodwork red pine and for the finishings yellow pine. The estimates came to about 9,600*l.*, and it is expected that that sum will not be exceeded.

THE GLASGOW CORPORATION AS BUILDERS.

In a paper on the Municipal Industries of Glasgow, read before the Philosophic Society, Dr. William Smart dealt with the building operations of the Improvement Trust, which produces 3*l.* 18*s.* 18*d.*, 3*l.* 11*s.* 7*d.* and 2*l.* 17*s.* 4*d.* per cent. He said, assuming these returns are kept up in the future, and that all proper charges have been included in the annual expenditure, it appears as if this experiment had justified itself by success—if success is to be measured by the avoidance of present loss

to the ratepayers. When a Corporation borrows at less than 3 per cent. from the public and invests that money in property that yields that amount, neither is the ratepayer directly taxed nor is the common good estate of the Corporation, in which every citizen is a part owner, in any way prejudiced. But why, of all industries, select the innocent trade of house supply for invasion, and so compete with an industry which is neither a monopoly nor an evil? The reasons given by the Trust are these. Owing to the stagnation in trade the City Improvement Trust found itself in possession of large areas which it had cleared of slums but could neither feu nor sell. Past experience seemed to show that, on the whole and in the long run, land in the centre of the city did increase in value and was accordingly a safe investment to hold. But meantime these building sites were earning no return. At the same time came the revelations of the housing of the poor in London and the agitation for supplying the very poor with houses that should not outrage the new canons of sanitation and cleanliness. It seemed to the Trust that it would be leading the way in this direction and at the same time improving the financial position of the Trust if they utilised their unfeued spaces by erecting dwellings that would serve as models of what dwellings for the poor should be. Guided by these motives and seconded, possibly, by those who saw in this the beginnings of a socialistic system which would extend in time to other private enterprises, the Trust began to erect the model dwellings in Saltmarket and elsewhere. I am not sure that I shall earn the gratitude of the improvement trust committee when I contend that the enterprise in this respect has justified itself by its failure. The sinking of 100,000*l.* in buildings will do very little, one way or another, to affect the supply of houses; it may be quite sufficient to decide an economic question of the deepest practical importance.

Five years ago the Workmen's Dwellings Company was founded for the purpose of providing comfortable and thoroughly sanitary houses for working people, at the rents current for the same amount of accommodation in the neighbourhood. In the new building in Rotten Row it provides two-roomed houses at 9*s.* 8*d.* per month, with a bonus of two weeks free in the year, while the Improvement Trust charges 11*s.* 4*d.* and 13*s.* 4*d.* for one-roomed houses. In its last annual report it is said that the rents current in the company's houses are practically the same as those of the "ticketed houses;" but keeping rents at this low figure the company cannot obtain more than 3·7 per cent. of return, and that at a time when repairs are at a minimum,

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and there are no unlet houses. And here we have the municipality, with all its experience in municipal industries and obtaining its money at the cheapest rate, making a similar experiment, charging considerably more rent, and able to do no more than clear interest on the money borrowed—the inference being that if the Trust had really faced the housing of the very poor, as the private company has done, it could not pay its way at all. I contend that the City Improvement Trust in its building scheme has made an experiment which had to be made, and that it deserves our gratitude as citizens for the lesson it has demonstrated. What is that lesson? From this place last year I had occasion to point out what nobody seems to take to heart, that with all our wealth we are still very poor. The money income of our nation, divided out equally among the population, would give, roughly, 33*l.* of income per head, which I am afraid is not a “living wage” for anybody. And even when we put this statistic in a more truthful way—for nothing lies like figures except facts—that an equal division of income would give only 16*5**l.* per family of five, it shows how impossible it is just now for even a large minority of us to have in our houses anything approaching luxury. Even if we were to discover any plan by which all the new wealth that comes into the world hereafter should go solely to the classes who have not enough now, there are a great many necessities of thoroughly wholesome life which, for many a long year yet, we could not expect to see in poor men’s houses.

Now, in this matter of housing, our appetite seems to me to have outrun our pockets. It is not so long since water led into private houses was unthought of, not to speak of bathtubs, wash-hand basins, and all manner of conveniences. The standard of comfort among the rich has risen so rapidly that many of us are demanding similar demands for the poor, without asking the previous question of whether they or we can afford it. I make the suggestion with diffidence—for it is always an ungrateful thing to throw cold water on enthusiasms one sympathises with—but should 2*s.* a week pay a rent of more than 3*s.* a week? and will 3*s.* a week pay for all the conveniences which we are demanding that builders should supply? The experiments we have just been considering seem to answer in the negative. I desire, then, to point out that, if this conclusion is correct, any further building on the same lines by the municipality is subsidising low wages by paying part of rent—in other words, redistributing wealth by taxation. This may be right and admirable, or

it may not—I merely point out the fact. In conclusion, let me say that this—success or failure, as you like to consider it—points the moral which I have tried on several occasions to bring out—that he is still the benefactor of his race who makes two blades of grass grow where one grew before. If we are still so miserably poor that we cannot afford every man a decent home, it is time we were considering if the better distribution of wealth is the only question of any importance. Perhaps the most pernicious heresy in popular economics of the present day is the idea that there is wealth enough and to spare somewhere, and that it can be got by simple insistence on a higher wage. Our working classes as well as our idle classes must do their share in growing the second blade. If an eight-hours day will give as much as one of ten hours, if forty shillings will give us twice as much as twenty shillings did, if trade union restrictions will make every workman a better workman, let us have the shorter day and the higher wage and the trade union. But in the face of the figures of national income which I have presented, it is folly to think that there is any way of securing every man a decent house but by a very great increase in the wealth-production of the community.

THE LONDON COUNTY COUNCIL’S WASTEFULNESS.

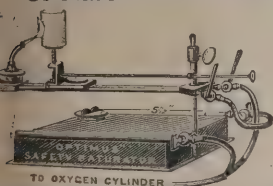
THE discussion on the report of the works committee was resumed on Friday, the 23rd inst.

Mr. Lloyd said he regretted that there had been so much friction between the architect’s department and the manager of the works department. The members of the Council ought to do what they could to lessen that friction. The works committee had perhaps taken too much upon their shoulders, and they had had to do it under considerable disadvantage. He was not at all sure that they had not made a mistake in not at the outset placing at the disposal of the committee a capital sum of 100,000*l.* They ought to wait a little to see how things would turn out, and he believed it would be found in a year or two things would prove very satisfactory to the Council. He was quite sure that the work would be done better than work had ever before been done by a great public body.

Mr. John Burns, M.P., maintained that this outcry against the works committee was raised for electioneering purposes. He had found it necessary to incur 260*l.* for libel and slander, and the cases had not yet come off, but that would not deter him from resorting to bold, truthful, plain statement,

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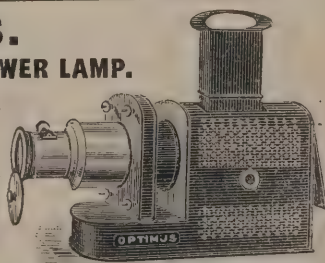
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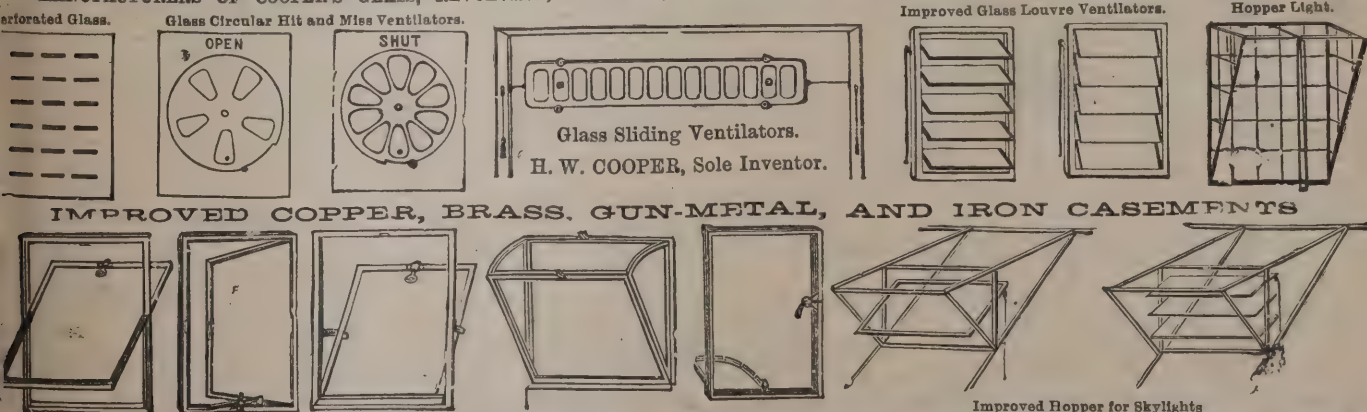


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in order to nail down misrepresentation and calumny, which were spending themselves before the election on the head of the works committee. The result of their business for the year was that on an estimated outlay of over 66,000*l.* only 63,000*l.* had been expended. The Council had been forced into the establishment of this department in consequence of contractors refusing to do their work and withdrawing tenders after they had been opened. In his opinion the works committee would never be able to make a large profit, and if subjected to pettifogging red-tape restrictions by the architect's department it must be a failure. There was no subletting, except in one or two cases where the committee asked to be allowed to sublet when they were not ready to go on with the work themselves; trade union wages had to be paid and were paid, and that represented a considerable increase in the price of work, and builders and contractors were beginning to feel the pinch of them; better work was done than under the old conditions; there was no scamping, and keener supervision. Even a loss would have been justifiable in the interests of the higher wages they had paid and had been compelled to pay and the good work they had done, and in the name of London, and for the future of London's architecture, they intended to act in spite of the contractor and for the benefit of the ratepayers.

Mr. Beachcroft noticed that the works department and the works committee felt very uncomfortable if anything in the nature of criticism was levelled at them. It might be said that it was premature to criticise the works department; he considered it was better that that criticism should take place now than that it should be attempted when too late to be worth anything. He was interested in the housing of the working classes, and the works committee would be entrusted with works of the value of some 600,000*l.* At present they had in hand building operations in Yabsley Street, Poplar, for which the corrected estimate was just under 16,000*l.*, and the actual cost 1,200*l.* more, and West View Cottages, Greenock, for which the corrected estimate was 29,336*l.*, and the actual cost exceeded that amount by 6,000*l.* In the latter case that meant a loss of 20 per cent. If the committee kept a profit and loss account like any ordinary contractor, they could tell at once how they stood without having to wait eighteen months or more before they knew whether they were working at a profit or a loss. There were two other works about to be undertaken by the committee amounting to an aggregated estimate of 490,000*l.* If they were to lose 20 per cent. on these big jobs

there would be a loss of 100,000*l.* to the ratepayers. If this loss were to go on the Council would never stand it. Rather than go on with any extravagant department they ought to give it up, for local bodies, not only in the Metropolis but throughout the country, were watching this experiment. The Council would be judged by its works, and he was anxious lest the Council should be condemned. The Moderate party believed the time had come when criticism should be levelled at this department, and when proper safeguards should be taken to prevent excessive expenditure.

Mr. Arnold thought it was too early yet to criticise the works committee and say whether the department they had set up was a success or failure.

After some further discussion, Mr. Ward, the chairman of the committee, replied. He pointed out the difficulties under which they had worked in the first year of their existence, and said they would continue for the next six or nine months until they had got their yard in order. Their establishment charges had amounted to 9½ per cent., but now they would be able to reduce them to 5, and perhaps 4½. The engineering work, he contended, was of the very highest class, and the quality of the building work was also superior. He trusted the Council would be fair to the works committee. They had had a very hard time of it. Several of them had given a good deal of their time and a great deal of their experience to make it a success, and he thought they had made it a success. They ought not to be judged by one single job; the Council could only judge of the thing as a whole, and, judged as a whole, the gain was 3,000*l.* Even if they had not made it a success he appealed to the Council to give them time until they could make a fair trial of the department. He admitted that the jobs to which Mr. Beachcroft had referred were going to be losing jobs, but the committee had others in hand upon which they would make considerable profit.

The amendment that the paragraph in the report relating to works should not be received was negatived, and the report received.

The committee further recommended that it be referred to the general purposes committee to consider and report as to the advisability of framing some standing order which will provide for the approval of the Council being obtained to the ascertained cost of works executed by the works committee.

Mr. Lemon moved the following amendment:—"That the following be added, 'And also provide that in carrying out any work the works committee shall not be at liberty to exceed

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the estimated amount of the cost except after a vote of the Council taken upon a recommendation submitted by the committee for which the work is being carried out approving the additional expenditure." Each committee entrusting work to the works department ought to know how it stood. The parks and open spaces committee had suffered considerable inconvenience through estimates which had been accepted by the works committee being exceeded, he was sorry to say, in all cases in which they had received complete information from them. There should be some means devised whereby, when work was handed over to the works committee on an estimate which they themselves had expressly approved, they should not exceed it without the sanction of the Council and intimation to the committee for which the work was done.

Mr. Campbell seconded.

Mr. Ward said that if the mover and seconder of the amendment had been practical men they would never have moved or seconded such an amendment. Perhaps they did not appreciate that the works committee did not and could not know until long after the work was completed how much it had cost.

Lieutenant-Colonel Ford and Mr. Antrobus having spoken, the amendment was negatived.

Mr. Westacott afterwards moved, and Mr. Fletcher seconded, that the following be added:—"And also provide that each committee, on whose recommendation any work shall be given to the works committee shall, in the event of the estimate being exceeded, report the same to the Council, with particulars of the amount by which it has been exceeded and the reason thereof, so that the Council may have the whole facts before them."

This amendment was also rejected.

The parks and open spaces committee also presented a report with reference to this subject, in which they complained that the estimates for works which had been entrusted to the works committee had been greatly exceeded. They submitted a list of seven works, the estimates of which amounted to 4,142*l.*, but which had cost 5,697*l.*—an excess of no less than 37 per cent. For the purpose of satisfying themselves that the estimates of their officials were reliable and reasonable, they had had prepared a return of all the works carried out for them by contractors, under the architect's direction, since May 1889. This return showed that eighty-two works had been so carried out, the estimates for which amounted to 52,138*l.*, while the total cost was only 48,722*l.* Under the circumstances the

committee thought they were justified in calling the special attention of the Council to the fact, as they were under the necessity of asking for an additional amount of 1,555*l.* in respect of the seven works enumerated by them.

Mr. Beachcroft moved, Mr. Fardell seconded, to add the following words to the recommendation:—"But that, in view of the facts above stated, it is desirable that a profit and loss account on works executed by the works committee should be forthwith established by the Council, fed when occasion requires out of the consolidated fund, and that it be referred to the finance committee to consider and report as to the establishment of such an account."

Mr. Ward said the works committee would agree in the principle of a profit and loss account if it could be legally established. A general reference to the general purposes committee as to its advisability would be accepted.

The amendment was negatived, and the recommendation of the committee approved.

FIRES IN THEATRES.

(Concluded from last week.)

WE have now gained a sufficiently clear understanding of the causes of fires and panics in theatres to enable us to turn to the second part of our subject, viz., the prevention of theatre fire catastrophes.

The principal measures for the prevention of theatre fire disasters should have in view, first, the safety of the people in the theatre, whether spectators, actors, stage hands or firemen on duty, and next, the safety of the building. The safety of the people comes first in the order of importance. The building may even burn down, but the public must under all circumstances have facilities for saving themselves. All efforts must be directed towards making the play-goers, the players, and the theatre employes safe. All manner of danger arising from a fire or from a panic, caused by a real or false fire alarm, should be averted, and appliances for saving life should be kept within reach. Next, the building should be made structurally safe, and efficient means for fire extinguishment should be provided, thus preventing the immense fire loss usually caused by a theatre conflagration.

The safety measures, to be briefly considered hereafter, may be divided into four principal groups, viz.:—(a). Measures to prevent outbreaks of fire, which include rules of theatre man-

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WILLIAM KEY, Ventilating and Heating Engineer, Central Chambers, 109 Hope Street, GLASGOW.

agement, regular systems of inspection; considerations of plan, size, location, and construction of a theatre, height of building and number of galleries, and structural details. (b). Measures to localise fires and to prevent their spreading, if in spite of precautions they do break out. Under this heading would come the fire walls, the fire doors, the fire curtain, the floor and roof construction, and the division of the theatre, horizontally and vertically, into many separate fire risks. (c). Measures to insure the safety of the spectators and of the stage people, to prevent injuries resulting from a jam or crush and a panic, the suffocation by smoke and death by fire. This group includes ample means for safe, easy, and quick exit from the burning building, and relates to such subjects as seats, aisles, passages, doors, stairs, and exits. It also embraces the questions of lighting and of ventilation, provision of stage ventilators, and special safety appliances, such as thermostats, automatic fire alarms, &c., telegraphic communication with the fire department, &c. (d). Measures to put out fires, which include all fire appliances, the stage sprinkler system, &c., a good, plentiful water service, &c.

1. To begin with, the theatre building should be isolated as far as practicable. Then, there should be in every theatre plenty of wide, well-arranged and well-distributed exits, leading the audience as quickly as possible to outdoors, and thereby decentralising the crowd. There should be separate and numerous fireproof stairs, at least two for each tier. For the stage and its accessory departments provision should be made for at least two independent exits. Fireproof stairs for the workmen should lead from the rigging loft down to the stage floor. The fire at the Opéra Comique, Paris, taught a good lesson in pointing out the necessity of having proper means of escape for the performers and workmen on the stage, which sometimes number as many as three or four hundred people. Where the theatre is not standing free on all sides, there should be wide courts on both sides and additional safety exits from the auditorium to the same, including suitable fire escapes from the balcony and upper galleries. Much the best plan, where the dimensions of the lot permit, is to have wide fireproof terraces, foyers or colonnades adjoining the corridors in each tier, which form places of safety for the audience in case they have to leave the theatre suddenly. All halls, corridors, passages, stairs, exit doors, courts and exits should be free from all obstructions. All exit doors should open outward. Exits should not be reduced at any point, but if possible should widen outward. There should be

plenty of wide aisles without steps, and no chairs or campstools should be permitted in the aisles. It is particularly important that there should be a sufficient number of stairs and plenty of exits for the occupants of the galleries, who, as the fire catastrophes described amply prove, are more endangered than the other spectators. Those who pay twenty-five cents admission fee have surely the same rights to safety as the occupants of three or five dollar seats, and in a place of amusement, to quote the words of the Rev. Dr. Duryea, spoken at the funeral services for the victims of the Brooklyn Theatre fire, "the poor should be made as safe as the rich."

Stairs from different tiers should not communicate together, nor should streams of people cross each other on their way out. All stairs should be provided with handrails on both sides; winding stairs and single steps should be avoided.

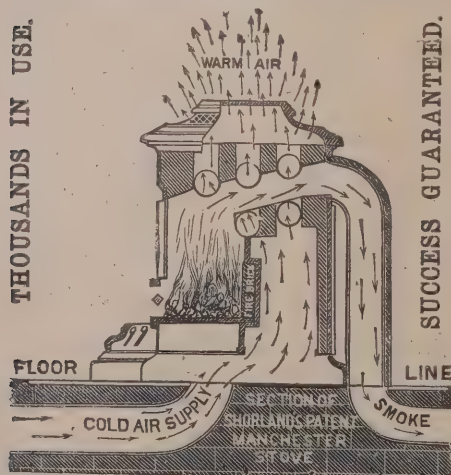
The provision of proper exits (including in the broader sense of the word aisles, corridors, stairs, doors), is by far the most important safety measure, both for fire and for panic. In fact, if properly carried out, it will save the lives of people even where all the other precautions are neglected. The aim should be to arrange the exits so that a theatre can be emptied without the slightest difficulty in from two to three minutes. Much will depend upon the available site, and upon the plan of the building.

If only plenty of exits are provided, so that, under all circumstances, the whole audience, even when frightened and suddenly thrown into a state of high mental excitement, can leave the building inside of two or three minutes, the fire-resisting qualities of the building are of less consequence, as regards the safety of the persons in the theatre. In fact, a theatre inferior in point of construction, but having exits as above described, would be safer than one built thoroughly fireproof, but otherwise not well arranged and not provided with sufficient stairs and exits, and where, therefore, in case of a false or real alarm of fire, or a panic from any cause, the people would be necessarily in grave peril.

2. Recognising, from the lessons taught by past theatre fire catastrophes, that the stage is the chief point of danger, it should be the aim to completely isolate this part of a theatre. Fire-walls should separate the stage from the auditorium on the one hand, and from the dressing-rooms and theatre offices on the other. The fire-wall dividing the auditorium from the stage, in which is located the large proscenium opening, should have as few other openings as possible, and none at all above the level of the stage. All openings should be kept closed by

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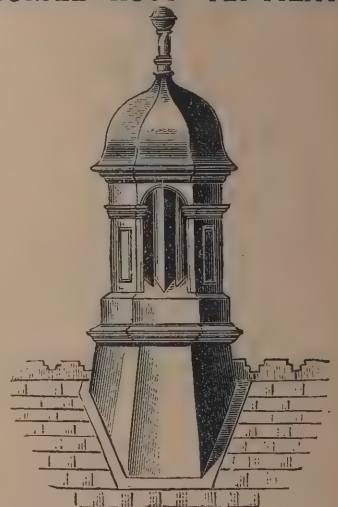
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fire-doors. The proscenium opening should be fitted with a fire-resisting curtain, closing as nearly as possible hermetically. The chief object of the curtain is to localise a stage fire and to cut off the fire, smoke, and the view of the fire during the retreat of the audience. It thus serves to restore confidence, and will often help to avoid the usual panic and jam. The fire-curtain should be able to withstand the increased air pressure due to the heat sufficiently long to enable the audience to make its escape. Whether the curtain be of corrugated iron or of asbestos, it is important that the apparatus for lowering the same be located on the stage, and not in the rigging loft, which place very soon becomes inaccessible when a stage fire breaks out.

3. Smoke and fire gases being the chief cause of death of the victims of theatre fire calamities, it is essential that large smoke ventilators or ventilating skylights be fitted up over the stage in order to remove the smoke at the highest point of the stage roof. Incidentally the stage ventilators tend to create a current of air from the auditorium towards the stage, and thereby prevent smoke, flames and suffocating gases from escaping into the auditorium. In this connection the abolishment of the usual central chandelier and ceiling vent in the auditorium is important. All ventilating registers for the auditorium should have dampers which are controlled and can be closed from the stage. This measure will tend to prevent the suffocation of the people in the upper gallery in case of a fire.

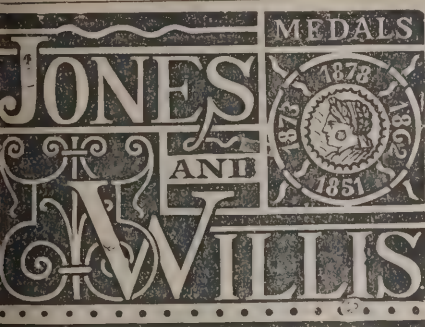
4. The study of the causes of theatre fires having shown that open gaslights in the vicinity of stage scenery and settings are the most prolific cause of fire, it is obvious that the stage and the scenery can be made much safer by fitting the same with incandescent electric light. All open lights, and gaslights in particular, as well as all sources of heat, should be eliminated from the stage. Incandescent electric light constitutes a brilliant, uniform and easily regulated light. It has not only the advantage of being much safer as regards danger from fire, but it is superior also because it does not vitiate the air, because it creates much less heat than gas, and because it does away with the dangerous lighting up of gas flames, which has been the cause of many a fire. In short, the electric light in theatres has all the advantages of gas without any of its inconveniences and dangers. But if gas-lighting must be used, the gas-piping should be most carefully done, all open flames should be well protected, the gas-meters set in a safe place, and the best available electric spark or flash-lighting system should be installed

for lighting up. In addition to the regular system of lighting, whether by gas or electricity, there should be provided in the corridors, stairs and exits auxiliary lights, either candle lanterns or oil lamps burning vegetable oil, to make the retreat of the people safer in case the gas is turned off or in case the electric light fails. The central gas chandelier in the auditorium, moreover, should be abolished.

5. To increase the safety of the stage still further, it is imperative to insist upon the fireproof treatment of all stage woodwork by the application of fireproof paint, and likewise upon the chemical impregnation of all gauze scenery, draperies, furniture and costumes, to render same unflammable. A further step forward in the right direction consists in the employment of light sheet iron frames or of wire-cloth netting, or in the use of asbestos for scenic decorations. Improvements in the stage machinery, such as the use of hydraulic power for raising and lowering traps and scenery in place of wooden hoisting drums and hand labour, the substitution of steel wire ropes in place of hemp cord, the entire abolishment of borders and wings, are much to be desired, all of which tend to make the stage safer. These are not merely theoretical suggestions; they have, on the contrary, proved eminently practical in actual use. The improvements recommended are largely due to the Asphaleia Society of Vienna, Austria, whose system of stage construction and stage machinery has been successfully used at the theatres of Buda-Pesth, in Austrian Hungary, at the People's Theatre in Vienna, at the Halle Stadt Theatre in Germany, in the Victoria Theatre in Sydney, Australia, and in the new Auditorium Theatre in Chicago.

The accumulation of much scenery or scenic decorations on or near the stage should be avoided, and not more scenery should be hung than is needed for two performances. Neither the auditorium loft nor the cellar under the auditorium should be used for the storage of scenery. Want of order on the stage is sometimes due to lack of store-room or to an insufficient number of stage hands.

6. In the construction of the theatre building fire-resisting materials should be preferred, and unprotected ironwork, granite and limestone should be avoided. The building should be divided into a large number of separate fire risks, both horizontally and vertically. The stage should be completely isolated by fire walls carried above the roof; all dressing-rooms should be made fireproof, and the whole auditorium and each of its tiers, corridors and stairs should be constructed in a fire-resisting manner.



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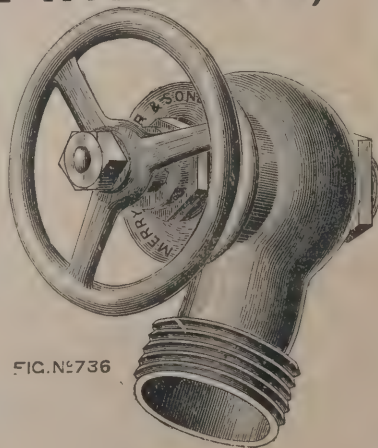
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GOLD MEDAL, Inventions Exhibition, 1885.

7. All scene docks, workshops, carpenter and paint shops should be banished from the theatre building and placed in a separate fireproof annexe. The heating apparatus, the dynamos of the electric-light plant, the fire pump and the gas-meter should be located in fireproof vaults, preferably under the sidewalk, but not under the stage nor under the auditorium. No living or sleeping apartments or stores should be located in the theatre building, and no dangerous trades should be carried on in the same.

8. In order to put out a fire in a theatre before it can gain headway, there should be provided an abundant supply of water under fire pressure and plenty of efficient fire-extinguishing appliances, such as one or more fire pumps, fire stand-pipes, fire valves, hydrants, monitor nozzles and fire hose; a large number of fire pails, casks of water, chemical fire extinguishers, fire axes, fire hooks on poles, wet sheets, wet sponges on long poles, &c. The whole stage should, moreover, be protected by an automatic sprinkler system, supplied from a large fire tank on the highest roof, and having also an outside fire departmental connection, to which the fire engines may be coupled. All the appliances mentioned are useful chiefly during the first moments of a fire, and wherever provided and kept in good order and in readiness for instant use, they have served to put out many a stage fire which, without them, might have resulted in a serious calamity. It is true, however, that as soon as the flames have spread in the majority of theatres as constructed until recently, the fire appliances would soon become powerless to subdue a fire.

9. Much care should be bestowed upon the heating apparatus for a theatre, for in not a few instances it has been the cause of a fire. A number of fires as sources of heat being out of the question on account of difficulties in attending to them, and also because they increase the fire danger, the choice lies between a warm air furnace, a steam and hot water boiler. Furnaces can only be used for theatres of small size, and in the majority of cases heating is done by steam. The usual precautions should be observed and the steam boiler placed in a fireproof vault, preferably outside of the theatre proper. It may with advantage be combined with the electric-light plant.

10. Efficient lightning-rod protection adds to the safety of a theatre building, and in European theatres its installation is generally included in the equipment of the building.

11. It is quite important to have on hand in every theatre, for cases of emergency, a few life-saving appliances, such as

rope escapes, a jumping-net and a cloth chute, to aid in saving persons in case their retreat from the upper floors should be too suddenly cut off by fire or smoke.

12. Finally, it will be a great help in preventing theatre fires if a fire watch is kept in the building day and night, reinforced during the hours of the performance by detachments from the city fire department. Nothing will increase more the security of a theatre than frequent inspections. There should be a telegraph connection with the nearest fire department station, and automatic fire alarms at many points in the building, which should be frequently tested to make sure that they are in good working order. There should also be speaking tubes, electric-bells and telegraph alarms, to bring all parts of the building into communication with each other. And lastly, the theatre employes should undergo regular fire drills, so that in case of an emergency each employé will know what duty he has to perform.

13. Many of the safety appliances spoken of can be arranged so as to work automatically. Such automatic appliances are good in their way and some of them have proved in actual experience to be quite efficient. They should not, however, be solely relied upon and in general it will be better not to trust to automatic appliances altogether. The automatic fire alarm system and the automatic sprinkler system may be approved, but the automatic sliding skylights or the smoke ventilators over the stage roof and the automatic fire curtain may fail to work properly when needed. I am quite aware of the fact that others argue in favour of automatic appliances, claiming that one cannot rely in moments of danger upon the coolheadedness of men, and that in a panic every one will think of his own safety first and theatre employes will forget their duties.

But in my judgment it is infinitely better to put all such appliances in charge of a special, reliable "safety officer," who may be a trusted fireman, whose sole duty, in case of an outbreak of fire, should be to lower the fire curtain, to open the stage ventilators, to close the auditorium ventilating registers, to send the alarm to the theatre engineer who runs the fire pump and to the nearest fire-engine station, to notify the audience promptly that they must disperse quietly, to see that the gas is not shut off and that the auxiliary lights are kept burning, to see that all doors leading to the stage are kept closed to prevent a draught, and who should order the water turned on at the fire hydrants, the monitor nozzles and the perforated pipe system, where such is installed in place of automatic sprinklers.

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CHANGES IN THE SCOTTISH IRON INDUSTRY.

OF late years the iron and steel industries in Scotland have undergone, says a correspondent of the *Scotsman*, some remarkable and revolutionary changes. The pig-iron industry was substantially founded on the discovery of the Blackband ironstone of the western part of the country, although one or two works—including those of Carron, which were founded about the middle of the last century, and were for many years engaged in the manufacture of the type of ordnance known as carronades—had been established before that. A turning-point in the career of the Scottish pig-iron trade was the discovery and application of the hot blast by Neilson, and another landmark was the construction of the works of Gartsherrie by the Brothers Baird in 1830. This firm did a great deal to extend the pig-iron industry, and acquired or erected one establishment after another until they had forty-two blast furnaces under their own control, thirty of which have been in blast at one time. No other firm in the history of the iron trade ever owned such a large number of furnaces at one and the same time, but it is a striking indication of the changes that have since then overtaken the iron industry that while the most that the Messrs. Baird ever produced from the whole of their plants was 800 tons per day, or 240,000 tons a year, this large quantity is no more than would now be produced by two and a half or three furnaces of the most modern American type. Twenty years ago the Messrs. Baird claimed to be the largest pig-iron makers in the world, and Scotland was no doubt duly sensible of the importance of the claim; but it is long since any Scottish firm enjoyed this distinction, and at the present time the works of Carnegie & Co. in the United States produce more than three times the largest quantity that even the firm of W. Baird & Co. ever produced in a single year.

The course of the pig-iron industry of Scotland continued to be pretty even and prosperous up to the year 1860, when the output of pig first reached 1,000,000 tons. It had grown to this figure from only 475,000 tons in 1845, and from 825,000 tons in 1855. When, however, the output had attained 1,000,000 tons a year, it appeared as if it could only go further with difficulty. From that time forward the production became subject to considerable oscillation. The maximum output of any one year was attained in 1870, when the quantity produced was 1,206,000 tons; but it fell to considerably less than this amount in the years 1873 and 1874, when the prices of pig were the highest on record, and when, therefore, there was every

inducement to get out the very largest quantity possible. Two causes appear to have operated to produce this result. The first of these was the difficulty experienced in procuring adequate supplies of fuel, which had not only reached a prohibitory price, but had become exceedingly scarce, owing to the miners having adopted a policy of restricted output. The second was the increasing scarcity of the special Blackband ores, on which the superstructure of the Scottish pig-iron industry was originally founded. This latter influence has since then retarded the growth of the Scottish pig-iron trade, and prevented it from again attaining the high water mark of output which was reached in 1870. Up to 1880 the output of iron ore in Scotland was generally over 2,500,000 tons a year, but from that date the production of indigenous ores commenced to decline until in 1890 they had fallen to less than 1,000,000 tons, and they are now considerably less even than that figure. Meanwhile, however, a new demand had arisen which the pig-iron makers of Scotland had to set themselves to meet. About 1878 the open hearth industry was established in Scotland, and this industry called for a quality of pig-iron that the Scottish works were not then producing, namely, Bessemer or hematite pig. The void was soon filled. The ores of Bilbao had then come into some prominence for the requirements of South Wales and other districts. Scotland began to import Spanish ores also, and increased the production of hematite iron year by year, until nearly one-half of the whole output assumed this form, the product of ores that had to be imported from mines something like a thousand miles away. To this extent Scotland became a direct competitor with the west coast works and with the South Wales pig-iron makers. But even with this new branch of industry to fall back upon the trade did not appear to increase.

The hematite iron now produced did not supplement but took the place of the so-called Scottish iron formerly made, until the output of the latter fell to less than 500,000 tons a year, and considerably less than one-half of what it had been only a few years before. This decline was not wholly due to the considerations already stated. There were other influences at work of a more technical character, and more especially the scientific advances that enabled continental consumers, who had previously depended on Scottish pig for foundry mixtures, to dispense with it for that purpose. There was, moreover, the keener competition to face of other British iron-producing districts, and of Cleveland in particular, and it is not improbable that the

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partiality that formerly prevailed in most of the leading countries of the world in favour of Scottish foundry brands had become lost, as they found out that they could get along without Scottish iron and find themselves little or none the worse. At any rate the Scottish branded ironmakers found it more and more difficult to dispose of their produce at the prices formerly obtained. Up to the end of 1877 it was a rare thing to find Scottish branded iron quoted or sold at less than 55s. per ton. Only three or four times—and then in the gloomy period 1859-61—had Scottish warrants fallen under 50s. Between 1848 and 1857 the average price of such iron was over 70s. per ton, and omitting, as being altogether exceptional, the eventful years 1872-73, when Scottish pig-iron averaged 101s. 10d. and 117s. 3d. per ton respectively, the general range of prices was such as to leave very satisfactory profits. During the last ten or twelve years, however, all this has changed. The average price of Scottish pig-iron warrants has generally fluctuated between 43s. and 46s. per ton, or at least 10s. per ton less than the average of comparatively recent times. This decline of prices has coincided with a higher cost of production for both iron ores and fuel, while there is no reason to believe that the Scottish ironmasters have of late been better treated by the railway companies. The limited amount of profits now earned in the making of Scottish pig-iron may be indicated by the fact that during the miners' strike in the Midlands, in the autumn of last year, many of the Scottish blast furnaces were blown out, in order that the supplies of coal might be temporarily diverted to the manufacturing districts of England that were prepared to pay a few shillings per ton more than the normal prices.

CRYSTAL PALACE CYCLE SHOW.

THE Metropolitan Machinists' Co, Limited, will show among others the following 1895 patterns of the well-known Juno cycles at the Crystal Palace (December 6 to December 11):—The Juno racing safety fitted with hollow rims, tangent spokes and racing Dunlop pneumatic tyres; also improved detachable crank chain wheel, permitting another to be quickly substituted and thereby either increasing or diminishing the gear at will. This machine is exquisitely finished in plain black enamel and plated parts, and scales only the wonderfully low figure of 21 lbs. Another specimen of the Juno racer, 22 lbs. in weight. A Juno light roadster, Dunlop pneumatic tyres and the new improved wood rims. The scale weight of this machine is 25 lbs.,

including detachable crank gear wheel. A Juno light roadster, 28½ lbs. in weight, otherwise a similar machine. A Juno road racer, 28 lbs. only, including non-slipping cover to the back wheel. Several specimens of the Juno lady's safeties, 28 lbs. only in weight, strong and light in build. The Juno juvenile safeties and the Juno folding tricycle, of the latter (1895) an admirable machine. Several improvements in detail of the build of the (1895) Junos should be noted—detachable chain wheels, permitting alteration of gear with quickness and ease; reduction in the width of tread, bringing the rider's feet closer together and affording increased power. The weight of all grades of Junos has been further reduced without infringing on the rigidity of the machine.

PATENTS

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

- 21792. John Thomas Lane and Frederick Albon, for "An improved locking-bar for doors, gates, &c."
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BARNSELEY.—Dec. 12.—For Building Villa. Mr. H. Crawshaw, Architect, Regent Street, Barnsley.

BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BARRY DOCK.—Dec. 10.—For Additions to Infant School. Mr. George Thomas, Architect, Queen's Chambers, Cardiff.

BATH.—Dec. 13.—For Fittings of the New Municipal Buildings. The Town Clerk.

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BERKHAMSTED.—Dec. 20.—For Building Stables. Mr. A. C. Meek, 237 High Street, Berkhamsted.

BIRMINGHAM.—Dec. 10.—For Building a Chimney-stack. Mr. Robert Godfrey, A.M.I.C.E., 25 Valentine Street, King's Heath.

BOURNEMOUTH.—Dec. 10.—For Proposed New Destructor Works at Fretmantle. Mr. J. Druitt, jun., Municipal Offices, Bournemouth.

BRISTOL.—For Building Baptist Chapel, School, &c. Mr. Herbert J. Jones, Architect, 12 Bridge Street, Bristol.

CARRICK-MA-CROSS.—Dec. 22.—For Additions to Donaghmoyn House. Mr. Logan, Architect, Dundalk.

CRAMLINGTON.—Dec. 13.—For Building Four Houses. Mr. J. G. Crone, Architect, 50 Grainger Street, Newcastle-on-Tyne.

CrAVEN ARMS.—For Building Board Schools. Mr. W. Medicott, Craven Arms, Shropshire.

CHEPSTOW.—Dec. 8.—Vagrant Wards. Mr. B. Laurence, Architect, Austin Friars Chambers, Newport, Mon.

CROMER.—Dec. 11.—For Construction of a New and Alteration of Existing Approaches to, and the Construction of Concrete Steps at, the Esplanade. Mr. J. C. Miller, M.I.C.E., 264 Gresham House, Old Broad Street, E.C.

DORCHESTER.—Dec. 12.—For Building Church Institute. Mr. J. Feacey, Architect, South Walks, Dorchester.

FARNHAM.—Dec. 11.—For Erection of a Board School. Mr. J. Nash, South Street, Farnworth.

FOREST GATE.—Dec. 18.—For Erection of a Block of School Buildings. Messrs. J. S. Newman & Jacques, 2 Fen Court, E.C.

GILWERN.—Dec. 12.—Extension of Board School. Mr. E. A. Johnson, Architect, Abergavenny.

GLASGOW.—Dec. 8.—For Works in Erection of Hospital for Infectious Diseases, Ruchill. The City Engineer, 64 Cochran Street, Glasgow.

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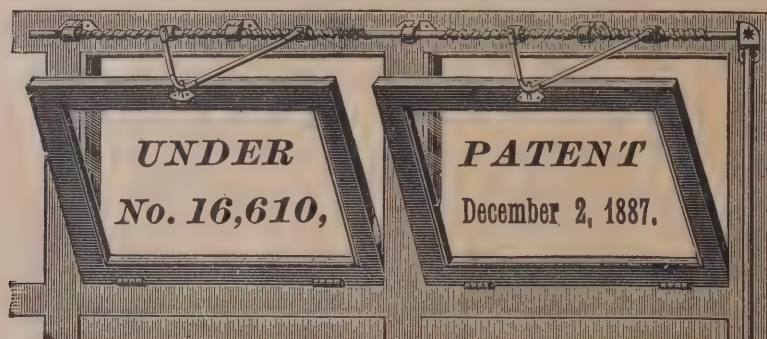
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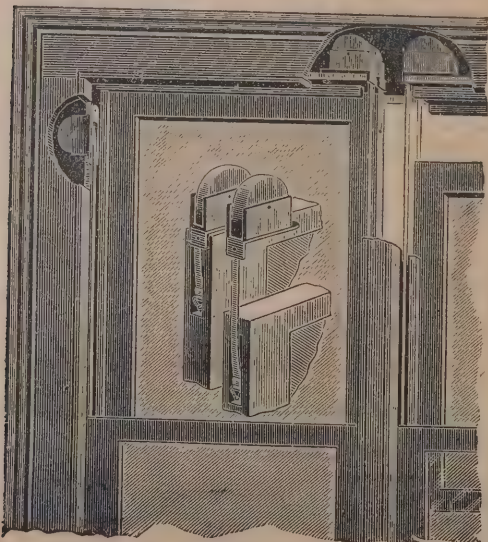
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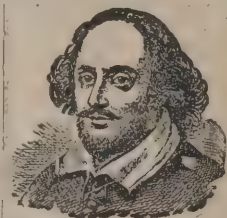
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Stevens Bros.		157	0
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Calnan & Co.		£660	0
Clarke & Bracey		598	0
Staines & Son		414	0
Johnson & Co.		375	0
McCormick & Sons		367	0
For Adapting House, No. 45 Southwark Park Road, for Housewifery Classes.			
J. Frampton		£690	0
W. & H. Castle		679	0
J. Marsland		548	0
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Leeks & Hooker		450	0
Rice & Sons		398	0

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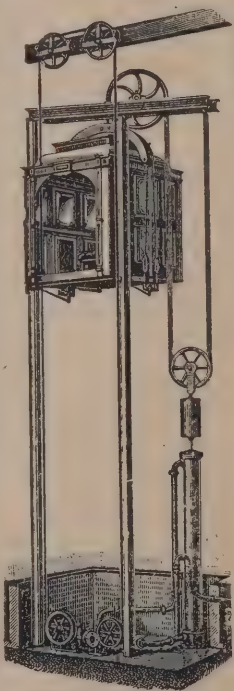
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W. Cunliffe, Kingston-on-Thames	£3,038	0	0
H. H. Barry, Radcliffe-on-Trent	2,990	7	10
J. R. Wartnaby, Melton Mowbray	2,851	0	0
C. Barnes, Melton Mowbray	2,706	0	0
H. Vickers, Nottingham	2,694	9	0
S. W. Pattison, Ruskington	2,686	14	0
Siddons & Freeman, Oundle	2,637	0	0
E. Clarke, Melton Mowbray	2,615	0	0
J. Mason, Leicester	2,611	7	6
S. F. Halliday, Stamford	2,575	9	6
T. & H. Denman, Melton Mowbray	2,513	0	0
Moss & SON, Loughborough (accepted)	2,460	0	0

Extension of Main Sewer, Burton and Dalby Roads.

S. W. Pattinson	£757	12	6
Moss & Son	750	0	0
S. F. Halliday	717	3	6
W. Stone, Lowick, Thrapstone	715	5	0
W. Cunliffe	715	0	0
J. R. Wartnaby	681	0	0
T. & H. Denman	670	0	0
C. Barnes	647	0	0
J. Mason	631	9	0
Siddons & Freeman	615	0	0
D. M. Sykes, Melton Mowbray	538	19	0
E. CLARKE (accepted)	525	0	0

Flood Gates on River.

H. Vicars	£306	10	0
J. R. Wartnaby	299	0	0
Goddard, Massey & Warner, Nottingham	275	18	8
Moss & Son	265	0	0
W. Cunliffe	260	0	0
C. Barnes	259	0	0
S. F. Halliday	253	0	0
E. Clarke	225	0	0
Siddons & Freeman	223	0	0
T. & H. Denman	219	10	0
Richards & Son, Leicester	207	13	0
S. W. PATTINSON (accepted)	195	15	6

LUTON.

For New Boiler House and Additions to Manufacturing Premises, Gordon Street, for Mr. J. Hill. Mr. A. WILKINSON, Architect.

J. Saunders	£255	13	0
W. G. Dunham	254	10	0
T. & E. NEVILLE (accepted)	245	0	0

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For Building Wesleyan Chapel, &c., Queen's Park, Northampton. Mr. H. H. DYER, Architect, Sheep Street, Northampton.

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G. J. Fisher	£600	0	0
W. T. Flavell	580	0	0
G. Bransom & Son	570	0	0
W. Throssell	560	10	0
N. Adams	560	0	0
J. M. Panting	550	0	0
J. Garrett	549	0	0
A. P. Hawtin	549	0	0
J. Dunckley	549	0	0
Wilford & Judkin	545	10	0
W. Heap	545	0	0
J. Woodford & Son	530	0	0
A. J. Chown	524	10	0
G. W. SOUSTER (accepted)	517	10	0

Stone.

G. J. Fisher	635	0	0
G. Bransom & Son	596	0	0
W. Heap	585	0	0
W. T. Flavell	580	0	0
J. Garrett	579	10	0
J. M. Panting	579	0	0
A. P. Hawtin	577	12	0
N. Adams	577	0	0
J. Dunckley	574	10	0
W. Throssell	574	10	0
Wilford & Judkin	570	0	0
J. Woodford & Son	565	0	0
A. J. Chown	544	10	0
G. W. Souster	535	10	0

OKEHAMPTON.

For Boiler-house at Workhouse.

J. HARRIS & SON, Okehampton (accepted)	£100	3	0
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W. R. Meazey, Albert Road	£150	18	0
H. A. Williams, 2 Sully Place	133	0	4
T. Griffiths, 18 Windsor Terrace	129	10	4
ESCOTT & FORD, 23 Windsor Road (accepted)	117	14	0

Arcot Lane (North).

W. R. Meazey	184	11	6
Escott & Ford	147	9	7
H. A. Williams	131	15	0
T. GRIFFITHS (accepted)	108	14	1

RUABON.

For Building House for the Police, Upper Ponkey.

J. Whittingham	£356	0	0
JENKINS & JONES, Johnstown, Ruabon (accepted)	332	0	0

RUSHDEN.

For Additions to Shoe Factory for Messrs. W. Claridge.
Messrs. MOSLEY & ANDERSON, Architects and Surveyors,
Goodyear Chambers, Northampton: Quantities by Architects.

H. Sparrow, Rushden	£1,420	0	0
Dunham & Bass, Kettering	1,396	0	0
H. Martin, Northampton	1,380	0	0
Hacksley Bros., Wellingborough	1,326	0	0
F. Johnson & Son, Earl's Barton	1,310	0	0
Freeman & Sen, Denford	1,292	0	0
G. Menon, Wellingborough	1,286	0	0
T. Wilmott, jun., Rushden	1,273	10	0
T. Swindall, Rushden	1,261	0	0
C. Bayes & Son, Rushden	1,255	0	0
Marriott, jun., Rushden	1,233	0	0
T. & C. BERRILL, Irchester (accepted)	1,201	0	0

For Additions to Shoe Factory, for Mr. B. Ladds. Messrs.
MOSLEY & ANDERSON, Architects and Surveyors, Good-
year Chambers, Northampton. Quantities by Architects.

T. Swindall, Rushden	£288	17	6
T. & C. Berrill, Irchester	287	0	0
T. Wilmott, jun., Rushden	280	0	0
R. Marriott, Rushden	275	0	0
H. S. BARROW, Rushden (accepted)	269	10	0

RYHOPE.

For Building Premises, for Mr. Walter Wilson. Mr. STEPHEN
PIPER, Architect, County Chambers, Newcastle-on-Tyne.

T. P. Shaftoe	£1,834	0	0
T. Lumsden	1,806	0	0
J. B. STOTT, Sunderland (accepted)	1,688	0	0
G. Moir	1,660	0	0

STROUD.

For Laundry Drying-house, at Workhouse, for the Guardians.

T. L. CHEW & SONS, Stroud (accepted)	£154	16	0
H. Beavis (too late)	130	10	0

TAUNTON.

For Sewerage Works, Staplegrove, for the Rural Sanitary
Authority. Mr. T. G. CRUMP, Architect.

Vickery & Poole Milverton.	£445	0	0
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TRING.

For Building Four Cottages, Tring, for Mr. J. Brandon. Mr.
WILLIAM HUCKVALE, Architect, Tring.

D. Osborn	£888	0	0
E. Smith & Son	839	0	0
J. Honour & Son	784	0	0
H. FINCHER (accepted)	750	0	0

WARE.

For Sundry Works to be done in Reconstructing the Drainage
and Sanitary Arrangements in the Infirm Wards, and
Building New Bath and Closet Blocks at the Ware Union
Workhouse, for the Guardians of the Poor. Messrs.
NEWMAN & NEWMAN, Architects and Surveyors, 31
Tooley Street, London Bridge. Quantities by Mr. W. T.
FARTHING, Surveyor, 46 Strand, W.C.

Rayment & Son, Hertford	£2,460	0	0
Munday & Son, Savage Gardens, E.C.	2,371	0	0
L. & W. H. Patman, Enfield	2,350	0	0
Thomas Hunt Ware	2,295	0	0
Thomas Rowley, Tottenham	2,289	0	0
Henry Norris, Hertford	2,210	0	0
W. Laurence, Waltham Abbey	2,162	0	0
S. HIPWELL, Wisbech (accepted)	2,100	0	0

WEST BROMWICH.

For Building Boys' School, Gun's Village, for the West
Bromwich School Board.

A. Horton	£2,313	0	0
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TRADE NOTES.

MR. ROBERT ADAMS, of 67 Newington Causeway, S.E., has supplied and fixed his patent "Exodus" and "Exit" bolts to the panic and exit doors of the new Bishopsgate Institute.

THE modelled fibrous plaster ceilings at Thurland Castle, illustrated in our last number, were executed by Messrs. J. W. Elmes & Son, of 62 Sydney Street, South Kensington, S.W.

THE cold weather is once again setting in. We are pleased to inform our readers that Mr. G. Shrewsbury, patentee and sole manufacturer of gas conservatory boilers, the "Calda" instantaneous water heater for gas or oil, gas baths, new patent "Unique" gas ovens, &c., Station Road, Camberwell, London, S.E., is now introducing for the season a new gas boiler for heating hot-water pipes, of an excellent kind, which also will be found most useful as a gas conservatory boiler. It will heat 40 to 50 feet of 3-inch hot-water pipe. The boiler is reversible to suit either hand, and the burner swings out for safety in lighting. The boiler, which is small, compact, efficient and cheap, is adapted for fixing inside or outside the conservatory, being made on the patent "Reliance" principle. If fixed inside, the flue pipe should be carried through the roof, and fresh air (for supply of burner), brought from outside by a short pipe attached to nozzle at back of stand. If outside conservatory, it can be placed in potting-shed, or any convenient out-building or galvanised case as used for the patent "Nonpareil" boilers.

MESSRS. WILLIAMS BROTHERS & CO., 3 Broad Street Buildings, E.C., write us re our notice of work done at Edmonton Union. Instead of saying "patent ventilating opening gear," "patent ventilating warming gear" should have been inserted.

At the meeting of the Birmingham City Council a reduction in the price of gas was announced by the Corporation, who hold the undertaking. It was stated that the average price of gas was the lowest charged in the kingdom.

VARIETIES.

At the meeting of the Manchester Association of Students of the Institution of Civil Engineers, Mr. A. Ross, C.E., the president of the Association, in the chair, Mr. Henry Fowler read a paper on the testing and inspection of plates. He first dealt with the requirements of specifications as to the number of tests to be taken, and passed on to the tensile tests which are most important, giving the tenacity and elongation for

boiler, bridge and ship plates. He also mentioned in detail the behaviour of the test pieces as regards the elongation and contraction of areas. The value of bend tests and drift tests, and the method of conducting them, were described; the value of chemical analysis, the necessity of making crossway and lengthway tests, the appearances of the different fractures, surface examination, &c.

THE "Railway Diary and Officials' Directory for 1895," published by Messrs. McCorquodale & Co., Limited, London, is quite up to the usual excellent standard. It is further supplemented by a most useful railway almanack.

At the meeting of the Architectural Section of the Philosophical Society of Glasgow, Mr. T. L. Watson presiding, Mr. Thomas Gildard, architect, read a paper on "An old Glasgow architect and some older ones." The lecturer gave many interesting remembrances of those to whose genius and skill the appearance of the city was so much indebted. He mentioned the names of thirty architects, and alluded to their important works.

THE materials of the Kirkdale Gaol buildings have been sold by auction. The chaplain's house and cottage were sold for 125% ; the reception-ward, scaffold-house, warehouse, &c., for 265% ; the governor's house, 300% ; the women's hospital, 35% ; the men's hospital and yard, 105% ; the millhouse, cook-house, laundry and English church, 1,800% . A sum of 2,630% was realised, apart from the price of some stone setts.

BUILDING AND BUILDERS.

THE new cemetery at Altrincham was opened on the 21st ult. by the Mayor. The cost has been 9,000% . The chapel is in fourteenth century style. The works have been carried out under the superintendence of Mr. Wm. Owen, architect, Manchester. Mr. John Matthews, of Nantwich, was the principal contractor; heating, Mr. James Smith; mosaic floor, &c., Messrs. J. & H. Patteson; stained-glass, Mr. James Jones; entrance gates, &c., Messrs. Cunliffe & Dean; boundary wall, Mr. J. H. Holt.

THE new Conservative Club, Glasgow, just opened by Sir E. Clarke, has been erected at a cost of 33,000% , exclusive of the site, and is considered the finest building of the kind in Scotland.

At the holding of the Govan Dean of Guild Court the application of John Grant Sharp, Glasgow, for lining to erect



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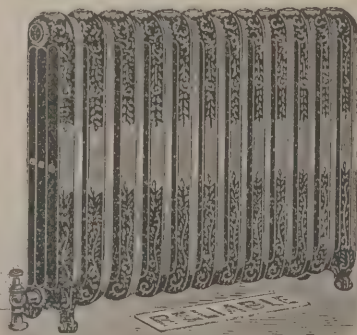
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BRANCHES:

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and Paris.

several tenements of dwelling-houses in Sharp Street was granted.

IN connection with proposed building operations at Hanley, the purchase of land for the erection of dwellings for the working classes is contemplated. It is also suggested that a turret should be built in connection with the pavilion in the Park for the large clock, a gift promised by Messrs. Pidduck.

A HOUSE for private patients is about to be commenced at Garlands, Carlisle. This is part of a scheme for providing accommodation for paying patients, consisting of a central main administrative building and a series of houses on either side. An excellent site has been chosen in the asylum grounds. The designs are being prepared by the county architect, Mr. Geo. Dale Oliver, Lowther Street, Carlisle.

THE Berlin City Council have authorised the health committee to have erected a boundary wall for the new fever hospital at Yardley, the estimated cost of which is 3,000*l*.

MESSRS. CHESSUM & SON'S tender, amounting to 32,266*l*., for erection of new offices of the Commission of Sewers in Basinghall Street was accepted on Monday.

ELECTRICAL.

AMONG the private Bills submitted for consideration at the next meeting of Parliament thirty-one are concerned with projects for electric lighting.

AN inquiry has been held at Fleetwood with regard to the Improvement Commissioners' application for borrowing powers for the proposed electric-lighting scheme. The proposals of the Commissioners include a complete system of street lighting. The scheme was opposed on behalf of the railway companies, who urged that the sewerage and other questions were much more pressing.

AT the meeting of the Hanley Town Council it was reported that a correspondence had taken place with the Brush Electrical Engineering Company as to the character of the plant and apparatus supplied by them at the Hanley Electricity Works. The company stated that it was their desire that the equipment of the works should give entire satisfaction, and they agreed to a proposal to send one of their engineers to supervise and be responsible for the running of the plant for a month in order to demonstrate what they believed to be the fact—that the plant was in good working order.

"OPTIMUS" SAFETY SATURATOR.

MESSRS. PERKEN, SON & RAYMENT write us:—The researches of scientists pursued during many years for a portable substitute for hydrogen gas to be used in conjunction with oxygen under pressure has resulted in the invention of the saturator, which will produce limelight by the aid of etho-oxygen. The saturator is exceedingly small, being only 6 inches long by 3½ inches wide by 1¼ inch deep; into this some eight or ten ounces of ether are poured, and absorbed by a specially non-inflammable packing. Oxygen under pressure is passed through the saturator, and by means of a blow-pipe or jet heats a lime cylinder to incandescence, giving a most brilliant light, eminently suited for the optical projecting lantern. For this purpose it has been most successfully employed for instruction and entertainment. The Rev. Archdeacon Shears, according to the enclosed testimony (see letter below), appears to have formed a high opinion of the "Optimus Saturator" manufactured by ourselves. This is no doubt a subject which at this season will interest many of your readers, and we shall be glad if you will insert the Archdeacon's letter.

Messrs. Perken, Son & Rayment.

Gentlemen,—I have tried many experiments with several saturators for optical lantern projection . . . and have come to the conclusion that the "Optimus" is by far the best. . . I never now use any other. . .

The grounds of my preference are:—1. Safety. I believe your "Optimus Saturator" to be perfectly safe. At one time I doubted this, therefore submitted it to very severe tests. If I try my utmost to get an accident I do not know how to accomplish anything worse than to damage the apparatus itself. If the operator will keep the saturator well supplied with ether and oxygen any mishap whatever seems impossible. 2. The jet is separate from the saturator. 3. For brilliancy of light obtained with perfect silence I believe your saturator to be unequalled. I use the "Optimus Saturator" with an objective of 2-inch diameter and 15-inch focus, and can get perfectly illuminated pictures at any practical distance.

(Signed) ERNEST H. SHEARS (Archdeacon).

Newport Road, Stafford: November 9, 1894.

THE new hospitals, Gosport, are being warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE INCANDESCENT GAS LIGHT

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One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of 3½ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 1, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different source of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

ARGAND " 44 " " " " " "

SIEMENS' BURNERS, 23 calories per candle per hour.

WELSBACH " 10 " " " " " "

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

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14 Palmer Street, Westminster, London.

PORLAND CEMENT.

A MEETING of the cement trade was held at the London Chamber of Commerce on Nov. 30 for the purpose of receiving and adopting, or otherwise, certain recommendations of the special committee which has been appointed to investigate and report upon the extent of the practice of admixtures with Portland cement, and as to the justifiability thereof. The trade with only one dissident adopted the recommendation of the committee, that it was advisable that all manufacturers of Portland cement who have used any outside material or materials in the manufacture of that article should at once discontinue the practice. The use, however, of not more than 2 per cent. of gypsum, as practised by the German manufacturers for the purpose of regulating the setting of the cement, is considered optional.

L.C.C. CONTRACTORS v. L.C.C. WORKS DEPARTMENT.

THE following letter has been written to the Chairman of the London County Council:—

Sir,—Our attention has been drawn to some remarks made by Mr. John Burns at a special meeting of the London County Council on Thursday last. Mr. Burns is reported to have said that although the estimate of the Works Department of the L.C.C. had been exceeded in many instances, the Council had the satisfaction of knowing that the works executed by their Works Department were of a better quality than the works executed by the contractors under the old conditions.

The excess of the estimates we do not propose to discuss; but we consider Mr. Burns's statement as to the quality of the work not only misleading to the ratepayers of London, but absolutely devoid of foundation, and calculated to damage ourselves and other contractors.

We challenge proof of this statement, and would suggest that a committee of experts be at once appointed by the Council to verify it, in fairness to the contractors and ratepayers of London.

We give as specimens of the works executed by us the following:—The Private Lunatic Asylum at Claybury, dynamo house and electric-light station at Claybury, foundations for the artisans' dwellings at Yabsley Street, Poplar, and the artisans' dwellings known as Beachcroft Buildings, Brook Street, Limehouse, E.

If in the opinion of the suggested committee of experts these works are not equal in quality of materials and workmanship to works of a similar nature executed by the Works Department of the L.C.C., we are willing to hand over 50% to any hospital you may name.

We presume that—if you adopt our suggestion—the report of the said committee will be published, and as we consider the matter of great public interest, we are sending a copy of this letter to the Press.—We are, sir, your obedient servants,

REED, BLIGHT & CO., LIMITED,

(Signed) Per John Reed, managing director.

Albany Buildings, 27 Victoria Street, Westminster, S.W.

November 28, 1894.

The following account of his experience (which is not unique) in carrying out works has been furnished by a contractor to the *Standard*:—

I have recently carried out a contract for the London County Council, amounting to 16,000*l.*, and have had an opportunity of inspecting some work done by this wonderful body, and of seeing how they contrived. I do not hesitate to say that they use materials which they (through their architect) would not dream of allowing a contractor to use; and I am prepared to prove this up to the hilt, and if I fail I will cheerfully give 10*l.* to the Builders' Benevolent Institution. Take, for instance, a few of the materials, viz.:—

Bricks.—Local bricks submitted by me to the architect were rejected, and I had to supply Kentish bricks, at a loss to me of over 200*l.*, yet they are using these (local) bricks, and now consider them good enough.

Sand.—I was compelled to use Thames river sand, the local pit sand being rejected; they are using the latter.

Deals.—I had to use those at about 2*s.* per foot cube. I could purchase those they use at 1*s.* 2*d.* cube.

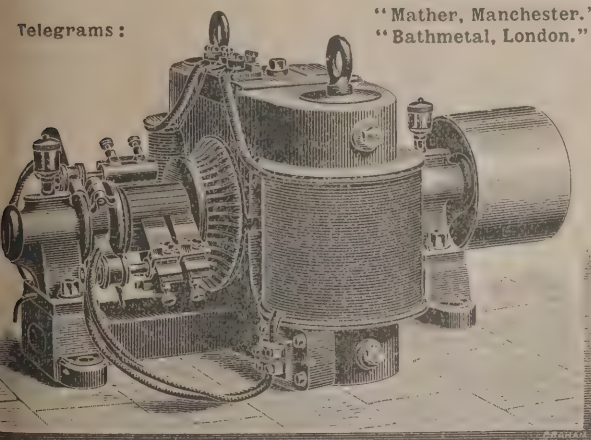
Oak.—To satisfy the architect I had to use oak that cost me 4*s.* 6*d.* per foot cube, yet that used by them I could obtain at 2*s.*; in most cases the posts have had to be reversed to get the required sizes above ground, so that the ends below actually taper.

Had I been allowed to carry out my work as they do it, my price would have been at least 10 per cent. lower, and the work would have paid me better.

Are the prime costs of the works committee burdened with the quantity surveyors' fees and lithography, and are clerical

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Also. Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1865, and December 1872.

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and management expenses charged to each contract? I note that nothing is charged for depreciation of plant, which on a job of any magnitude would be a serious item. Taking all these things into consideration, coupled with the fact that the work done by them is not of anything like the standard described in their specifications, I should think they have made a bigger hash of this experiment than is even shown by their report, and the old saying, that "The man who is his own surveyor has a fool for a client" will, I think, apply in this case. Let me, at any rate, hope that in future they will be more magnanimously disposed towards builders undertaking their work, and not harass them in every conceivable way, both as regards captious fault-finding and by keeping them out of their money forty days after certificates are applied for and twenty-eight days after they are delivered.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

At the annual meeting of the members of the Birmingham Master Builders' Association, held at the offices of the secretary, (Mr. E. J. Bigwood), Colmore Row, Mr. T. Barnsley, president, occupied the chair, and there were present Messrs. R. Bulley, J. S. Surman, T. Surman, J. Goodman, T. Johnson, J. Jeffery, R. Fenwick, E. Bates, W. Sappcote, A. S. Smith, J. Archer and F. G. Whittall.

The annual report stated that depression of trade still continued, but the progress of several large works in the city, notably the new General Hospital, the Technical Schools and the railway extensions, had provided a fair amount of work for the operatives in several branches of the trade. The year had been an uneventful one, no matter of importance having disturbed the amicable relations between employers and employed. The standing committee, with the representatives of the stonemasons and bricklayers, had met several times, and satisfactorily disposed of minor disputes. The committee, the report concluded, after carefully considering the matter, decided not to give notice to the operatives of any alteration in existing rules, and the same unwillingness to disturb the existing state of affairs appeared to have prevailed with the operatives, for no notice had been received from any branch. The membership of the Association numbered sixty-five. The statement of accounts showed that the receipts for the year had been 124*l.* 10*s.* 2*d.*, which, with the balance of 28*l.* 13*s.* 11*d.* from last year, made a total of

153*l.* 14*s.* 1*d.*, and there was a balance in hand of 64*l.* 11*s.* 8*d.* The report was adopted.

Mr. T. Barnsley was re-elected president, and, in thanking the members of the Association for the confidence again placed in him, expressed the hope that the affairs of the building trade would go on as smoothly during the present year as they had done during the past. As a trade they had to be thankful for the good weather which had prevailed, and as a result of which the workmen had been able to make almost full time. He hoped the open weather would continue till Christmas, and then there would be no distress amongst the workmen and their families.

The following officers were reappointed:—Vice-presidents, Messrs. T. Rowbotham and R. Bulley; treasurer, Mr. G. Twigg; auditors, Messrs. J. Bowen and T. Surman; secretary, Mr. E. J. Bigwood.

A vote of thanks was passed to Mr. Barnsley for his services during the year, and for presiding at the meeting.

ANTIQUE ART.

MR. ICHENHÄUSER is now showing at 52 Brook Street—his temporary premises during the rebuilding of his Bond Street Galleries—a really superb collection of *objets d'art*, embracing, as his card of invitation states, "old masters, old china, and old furniture." Among the first are some notable examples (all are in perfect condition) of Backhuysen (a fine view of Medieval Antwerp), the older and younger Teniers, the two Poussins, Vandyk, Lely, Wouvermans, Van Hooze, Van Lint (an interesting picture containing some forty or fifty contemporary portraits), and other equally famous old-time painters. There are some interesting early German triptychs and—which is specially worthy of inspection—a very fine series of panel pictures by early German masters forming the complete decoration of a chapel.

Among the china are a grand suite of richly decorated jars and beakers, some 5 feet in height, and many choice specimens taken from the Pekin summer palace, &c. The furniture comprises rare old cabinets, writing-tables, buffets, &c., in elaborately carved oak and other woods, some of German origin or from the Low Countries, and some dating from the best periods of French art, while an extensive array of equally highly wrought carved panels and doors complete and form an admirable background to the collection.

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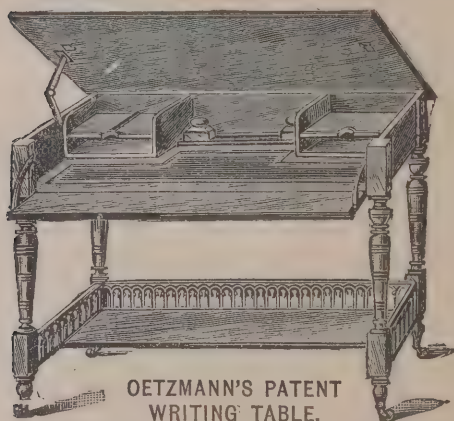
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THE PLUMBERS' COMPANY.

THE Company of Plumbers gave a banquet on Tuesday evening in the Goldsmiths' Hall, London, under the presidency of Alderman Sir Stuart Knill, the Master of the Company. Amongst the guests were the Lord Mayor of London, Mr. Sheriff Samuel, Dr. Thorne Thorne, of the Local Government Board; Mr. Diggle, of the London School Board; Mr. T. de Courcey Meade, city surveyor, Manchester, and many provincial mayors, chairmen of County Councils and medical officers of health.

Sir Stuart Knill, in proposing "The Municipal and County Authorities of the United Kingdom," said that the great work of plumbers' registration, and the work generally of that Company, had been accepted throughout the length and breadth of the land by municipal and other authorities as urgently necessary to nearly every town. The work of education, examination and registration was being well carried out.

Mr. Littler, Q.C., as chairman of the Middlesex County Council, responded, and expressed the belief that the action which was being taken by the plumbers was reacting beneficially on other trades, and tending to make them aim at a higher standard.

Sir Stuart Knill subsequently stated that twelve working plumbers had that day been admitted into the freedom of the Plumbers' Company, having passed first-class in honours in the City Guilds examination.

AFTER complete renovation, St. Matthew's Church, Little Lever, Lancashire, has been further embellished by the addition of a chancel screen in oak, and oak communion rails, both elaborately carved by Messrs. Earp & Hobbs, of London and Manchester, who have also erected a mural monument on the north wall of the chancel in memory of the late vicar. The work has been carried out from designs and under the superintendence of Mr. R. Knill Freeman, F.R.I.B.A., surveyor for the diocese.

NORTHERN ARCHITECTURAL ASSOCIATION.

THE following rules have been prepared for adoption by members of the Northern Association.

I.—Name.

1. The name of the Association shall be "The Northern Architectural Association."

II.—Objects.

2. The objects of the Association shall be to promote union amongst its members, the elevation of the profession of architecture, the establishment of uniformity of practice and professional charges, and the general advancement of the art and science of architecture.

III.—Constitution.

3. The Association shall consist of four classes of members, viz. members, associates, students and honorary members.

4. Members shall be architects in practice as principals, or as town or county architects, who have so practised for not less than three consecutive years immediately preceding their nomination.

5. Associates shall be architects in practice, but not yet eligible as members, or assistants (exceeding the age of twenty-one years) in the offices of gentlemen eligible as members or associates.

6. Students shall not exceed the age of twenty-one years, and be engaged in the study of architecture in the offices of gentlemen eligible as members or associates.

7. The Association may, on the recommendation of the Council, confer honorary membership upon gentlemen eminent for distinguished attainments, or who have rendered services to the Association or profession.

8. Members and associates only shall have the right to vote.

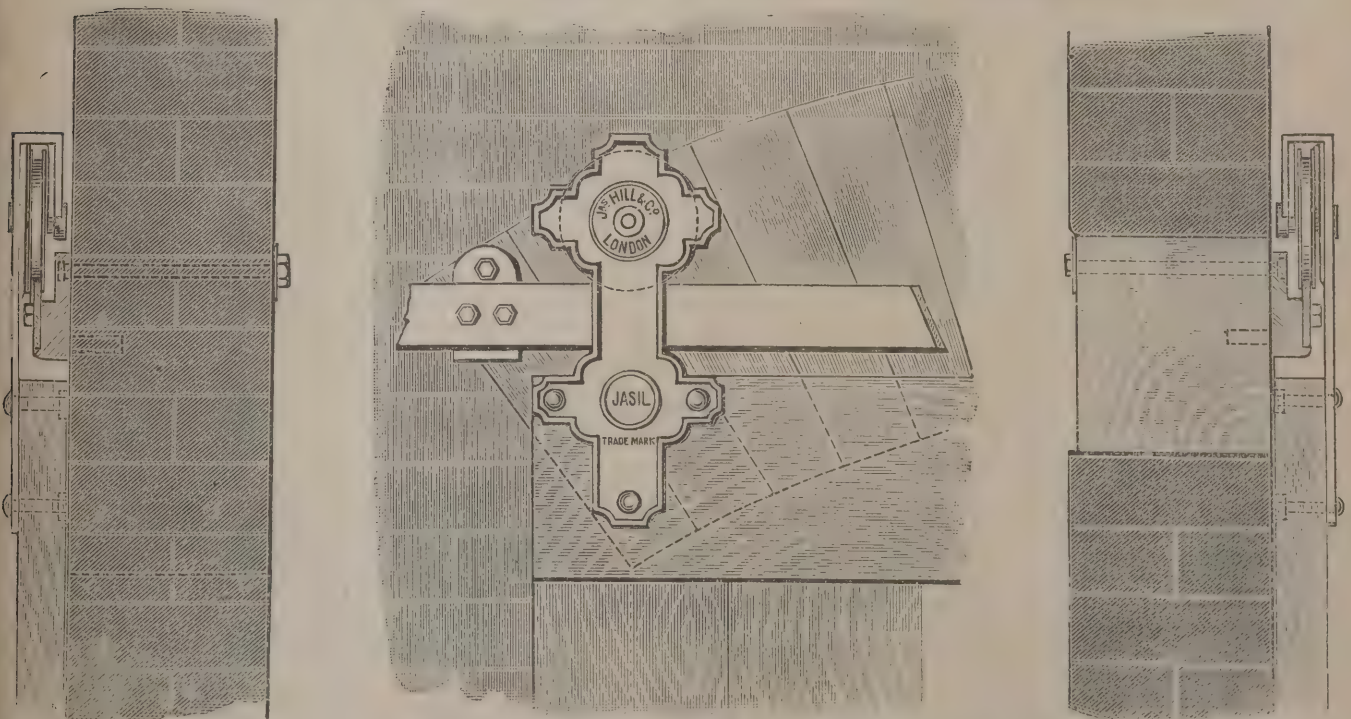
IV.—Election of Members.

9. Gentlemen desirous of being admitted members, associates or students must be nominated by two members or associates in the form annexed to these rules. The forms to be sent to the secretary who shall lay them before the next Council meeting, and if found in order, the names of the candidates and proposers shall appear upon the circular convening the next ensuing general meeting of the Association. The names shall again be inserted in the circular convening the following meeting, at which the voting shall take place by

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ballot, and one dissentient vote in five shall exclude; but no decision shall be come to unless at least six votes are recorded, failing which the decision shall stand adjourned to the next or following meetings.

10. Students desirous of becoming associates, or associates of becoming members, must again be nominated and balloted for.

11. The voting for honorary members shall be by show of hands.

12. In the case of the non-election of any gentleman, no notice shall be taken thereof in the minutes, and he shall not again be nominated to the same class of membership during the ensuing twelve months.

13. Every gentleman on his election shall be required to sign his name, agreeing to conform to the rules, in a book provided for that purpose.

14. If the Council shall have reason to consider that the conduct of a member has been derogatory to the Association, they may, after giving fourteen days' notice to him in writing, lay a statement before a special meeting to be called for the purpose, under rule 33, at which a vote by ballot shall be taken; and if four-fifths of the votes be recorded against him, he shall cease to be a member of the Association, but no decision shall be come to unless seven votes are recorded.

V.—Subscriptions.

15. An entrance fee of 1*l.* 1*s.* shall be paid by each member, and 10*s.* 6*d.* by each associate. Members elected from the class of associates shall pay 10*s.* 6*d.*

16. The annual subscription of members shall be 1*l.* 1*s.*; of associates, 10*s.* 6*d.*; and of students, 5*s.*

17. All subscriptions shall be payable in advance, and shall become due on January 1 of each year.

18. Every member shall pay his entrance fee and first annual subscription within two months of his election, otherwise such election shall be void; but members elected after October 1 in any year shall be exempt from the payment of their subscriptions for the following year.

19. All members shall be liable for payment of their subscriptions until they send written notice to the honorary secretary of their withdrawal from the Association; but when any member's subscription is two years in arrear, notice shall be given him in writing by the honorary secretary, and if the arrears be not paid within one month of the date of such notice, he shall thereupon cease to be a member of the Association.

VI.—Council.

20. The officers of the Association shall consist of president, vice-president, honorary secretary, honorary treasurer and honorary librarian, who, with five other members and two associates, shall form a Council for the direction and management of its affairs. The last retired president and each honorary local secretary shall be *ex officio* members of the Council. Four to form a quorum. There shall also be an honorary solicitor, appointed annually by the Council.

21. The officers and Council (except *ex officio* members) shall be elected for one year, by ballot, at the annual meeting. Nominations to be sent to the secretary at least three weeks previously. A list of such nominations to be issued to each member and associate, along with the notice convening the annual meeting, and the voting to be by means of such lists returned (under cover to the secretary), at or before the annual meeting, the members voting by the erasure from such list of the names of those for whom they do not vote. Two scrutineers to be appointed at the annual meeting, to open and examine the voting papers, and to report the result of the elections thereat. In the event of any member being elected for more than one office, he shall be deemed elected to the higher in the order of precedence named in rule 20.

22. The president and vice-president shall not be eligible for re-election to the same office for more than two consecutive years. The other members of the Council shall be eligible for re-election, with the exception of the two whose attendances have been least during the session, equality in the number of attendances to be decided by drawing lots.

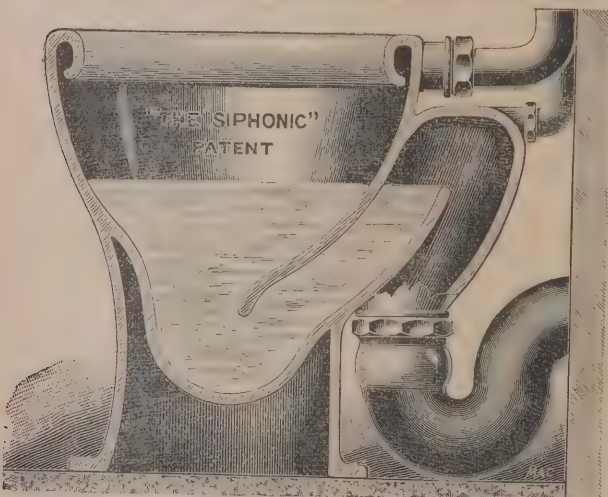
23. The president, or in his absence, the vice-president, shall preside at all meetings, but in their absence the members present shall elect a chairman. In case of an equality of votes on any question the chairman shall have the casting vote.

24. The secretary shall have charge of all the property of the Association, except the funds and the library. He shall take minutes of all meetings, and manage the general correspondence and business of the Association subject to the direction of the Council.

25. The treasurer shall have charge of the funds of the Association, and shall receive and disburse the same subject to the direction of the Council. He shall present an audited account at the annual meeting.

26. The librarian shall have charge of the library, subject to the direction of the Council.

27. The Association may, on the recommendation of the



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Council, elect annually from among its members honorary local secretaries for towns or districts at a distance from Newcastle; they shall communicate with the Council on any matters affecting or of interest to the Association occurring in their respective localities.

28. One member and one associate shall be appointed at the annual meeting to audit the accounts of the Association for the ensuing year.

29. Vacancies occurring during the year to be filled as the Council may appoint.

VII.—Session and Meetings.

30. The session shall commence in November of each year, and meetings be held in each month up to and including March, the following year. The annual meeting shall be held in March; it shall, however, be in the power of the Council to vary the commencement and duration of a session should it appear necessary.

31. There shall be at least one additional meeting held during the summer months, at some place of general interest to the Association.

32. Special meetings shall be convened by the president on the requisition of ten members, or may be convened by the Council.

33. When any matter relating to professional practice is under consideration at any meeting, it shall be open only to members and associates in practice.

34. Each member shall have the privilege of introducing a visitor to the ordinary meetings of the Association, except when any special business may be under discussion. Each visitor and the member introducing him to sign their names in a book provided for the purpose.

VIII.—Alteration of the Rules.

35. No alteration of the rules shall be made except at the annual general meeting, or at a special general meeting. Seven days' notice of the proposed alteration to be given in either case in the circular convening such meeting.

It is stated that the War Department have decided to proceed at once with the erection of a station hospital and accessory buildings at Shorncliffe Camp. The work will be carried out by private contract, a tender having been accepted, and it is understood the cost will amount to nearly 30,000*l*.

WEST OF SCOTLAND SANITARY ASSOCIATION.

THE annual meeting of the West of Scotland Sanitary Association was held in Glasgow, Mr. James Aitken presiding. The report showed that during the year there had been 534 houses examined, as contrasted with 447 in the previous year; 765 visits paid, against 611; and 465 reports issued, against 393. The income for the year amounted to 967*l*. 16*s*. 1*d*., and there is a balance in favour of the Association of 171*l*. 16*s*. 5*d*. The Chairman, in moving the adoption of the report, said the Association had raised the standard of sanitary matters in the city, as masons, plumbers, and others connected with sanitary matters had been instructed by it, and were now much more alive to the matters it urged than was formerly the case. Even in the case of churches it might be safely said that the imperfect ventilation was in many cases not unconnected with defective drainage.

BUILDERS' BENEVOLENT INSTITUTION.

THE election of two pensioners on the funds of this charity took place on Thursday, November 29, at the offices of the Institution, 35 Southampton Row, Bloomsbury Square. Mr. Basil P. Ellis (president) occupied the chair, and amongst other friends of the Institution there were present Mr. Geo. Plucknett, J.P. (treasurer), Mr. C. Bussell, Mr. J. T. Bolding, Mr. T. Stirling, Mr. T. Stirling, jun., Mr. T. F. Rider, Mr. C. B. Kew, Mr. R. Perkins and Mr. J. W. Scrivener. There were two vacancies for pensioners, viz. for one man and one woman, there being one male and seven female applicants.

At the close of the poll the scrutineers (Messrs. T. Stirling and T. F. Rider) announced the result, which was as follows:—Jack Taylor, Bermondsey, aged 62, master slater, 135 votes; Sarah Elizabeth Drake, Tylers and Bricklayers' Almshouses, Ball's Pond, aged 64, widow of Francis Drake, builder (seventh application), 3,273 votes; Mary Ann Healing, Curtain Road, aged 64, widow of Samuel Healing, builder (fifth application), 590 votes; Diana Elizabeth Powell, Camberwell, aged 61, widow of G. T. Powell, late a pensioner (second application), 1,976 votes; Mary Anne Bowley, Tyler's Cottages, Ball's Pond, aged 67, widow of H. R. Powell, late a pensioner (first application), 569 votes; Eliza Ellis, James Street, W., aged 75, widow of E. G. Ellis, builder (first application), 1,126 votes; and Ellen Batchelder, Carshalton, aged 61, widow of Chas. Batchelder, builder (first application),

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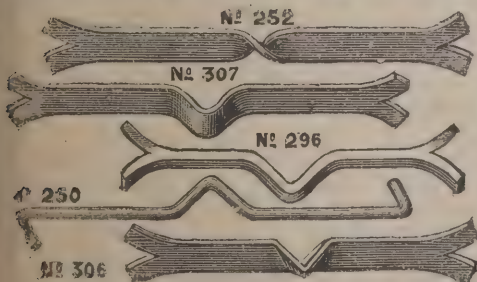
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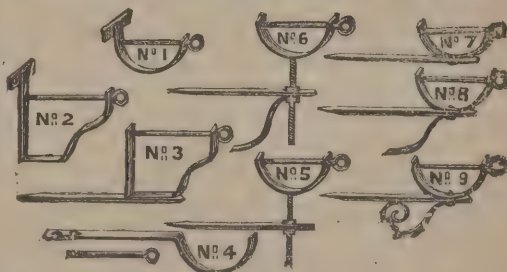
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580 votes. The successful candidates were therefore Jack Taylor and Sarah Elizabeth Drake.

Votes of thanks were passed to the Chairman and the scrutineers, and the proceedings terminated.

VESTRY OF ST. MARY, ISLINGTON.

THE underground convenience which is constructed under the carriageway of High Street comprises entrance and exit staircases enclosed by wrought-iron railings, six w.c.s, twelve urinals, lavatory with three basins, attendant's room and two store-rooms. The roof is formed of pavement lights supported on steel joists, and is laid out as a refuge. The brickwork has been built in Portland cement. The interior is faced with white glazed bricks with a plinth and dado of blue glazed bricks, the whole being laid with very fine joints. To prevent the soaking of water into the brickwork a horizontal damp course has been laid in all walls at the floor level, the back of the exterior walls has been twice coated with a boiling mixture of tar and pitch, and a backing of dry rubble has been put round the walls and drains formed of channel pipes laid so as to discharge subsoil water through weep-holes in the exterior walls into gullies inside the convenience.

The drains are formed of glazed stoneware socketed pipes jointed with cement and made watertight. They are ventilated into brick chambers in the carriageway, the chambers also acting as surface water gullies.

Doulton's "Simplicitas" w.c.s have been used, and they are flushed by the "Paisley" cisterns, each of three gallons capacity. The basins are fixed by bolts embedded in concrete, so that a basin can be replaced, without disturbing the tiling of the floor, by simply taking off the nuts and placing another basin over the bolts, which remain fixed permanently in the concrete, and replacing the nuts. Charles Smith & Sons' indicator locks have been fixed on the doors of the w.c.s.

The urinals have semicircular backs of white glazed ware, with screens and backs of Rouge Royal marble. The only special feature in the construction is a movable slab in the back, which makes the pipe, to each urinal accessible without the removal of the whole of the marble back. The lavatory is furnished with Doulton's pedestal basins of the tip-up kind. All the frames of the doors and partitions have been set on chamfered bases of York stone 3 inches above the level of the floor, in order to prevent their lower parts being injured by water

splashed from the hose. The floors are laid with vitreous tiles. Cast-iron gratings and a central lamp column, on the refuge have been provided for the ventilation of the convenience. Gas-jets fixed over the doors of the w.c.s will light the convenience at night, and the products of combustion will be collected by hoods placed above the jets, and conveyed by tubes discharging under the ventilating gratings on the refuge.

The work throughout has been designed by Mr. J. Patten Barber, M.Inst.C.E., chief surveyor to the Vestry, and carried out by Messrs. Doulton & Co., sanitary engineers, London, Paisley and Paris, the cost amounting to 1,510*l*.

THE SMOKE NUISANCE IN GLASGOW.

AT the Glasgow Central Police Court, on November 28, the principals of a printing firm in Union Street were charged with permitting a smoke nuisance at their works. No prosecution has been instituted heretofore in cases where the smoke has been emitted for less than ten minutes in one hour, but the authorities have decided to prosecute even though the emission be under that limit.

After evidence had been given, Mr. Gray, C.E., and Mr. G. Carruthers Thomson, C.E., submitted the following report on black smoke and its prevention, which they had prepared on the instruction of the authorities:—

Insufficient Boiler Power.—When this occurs the fireman has to force the fire unduly in order to obtain the largest amount of work out of the boiler, and he does so at the cost of the fuel and a large emission of black smoke. The sole remedy in this case is more boiler power.

Unskilful Firing.—In this case the fuel is generally thrown into the furnace in large quantities until it is practically filled with coal, the temperature of the furnace being lowered by such a mass of cold fuel, and the air admission through the fuel being unduly restricted black smoke in volumes is the result. The boiler power in this case may be ample, and all that requires to be done is to regulate firing so that only small quantities of fuel be thrown on the furnace at one time, so as to keep the temperature high. The adoption of the system of alternate side firing in such a case will do away with the emission of black smoke, and only a few minutes of light smoke will be observed.

Quality of Fuel.—Where the fuel is very poor and dirty, or the other extreme, rich and gassy, smoke may be emitted to a considerable extent if the fireman does not pay attention to



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his method of firing. This can only be remedied by the attention of a skilled and intelligent fireman.

Defective Flues or Building-in of Boilers.—This defect usually shows itself by affecting the draught of the air supply to the furnaces, and the only remedy is to put the flues in order and rebuild the setting of the boiler.

Defective Draught.—This is sometimes caused by the chimney being too small in height and diameter, and this can only be remedied by rebuilding the chimney, or by using some mechanical method of increasing the draught. Some fuels require more draught to insure thorough combustion than others, and where the draught cannot be altered the fireman must use his intelligence and fire the furnace to meet the existing conditions. With reference to the use of mechanical stokers and smoke-preventing appliances, the mere fact of their being in use on the boiler will not prevent the emission of black smoke, and here, as in using the shovel in hand-firing, the intelligent and skilful fireman can do away with black smoke and take the most out of the fuel, but if he has to take all the work out of the boiler that is possible he cannot avoid the emission of black smoke. In order to prevent smoke it is necessary to fire lightly and often, and to attend to the regulation of the draught by means of the damper. The difference on the amount of fuel used in the same boiler under the same conditions by a good stoker and a bad one runs from 10 per cent. to 25 per cent., an amount which more than makes up for the difference in wages. As the result of actual experience, the emission of black smoke for ten minutes per hour from a chimney is unnecessary, as a battery of several boilers can be fired and steam kept up with, at the outset, two minutes of black smoke, three to five minutes medium and about fifteen minutes very light smoke per hour, so that no excuse should be taken where this is exceeded. In plate furnaces smoke can be avoided quite well if properly fired, and the same applies to steel reheating furnaces where gas is used, in the management of the gas and air supply, and the dampers are regulated to suit the work. A little black smoke is unavoidable when lighting up fires and when everything is cold, or breaking up fires after they have been banked up for some considerable time, but beyond this the emission of black smoke is unnecessary where the boilers are of sufficient power and, as previously stated, where every attention is paid to the other different points.

In answer to Mr. Neilson, both engineers said that the ten minutes standard was not in accordance with modern appliances, and they were of opinion that in numerous cases prosecu-

tions should be instituted when there was less than ten minutes of black smoke in the hour. As this was the first case of the kind a penalty was not inflicted.

FIRE PROTECTION.*

I SHOULD first explain what I understand fire protection to be. The term is, I am afraid, all too often misunderstood. Fire extinguishing, in other words fire-brigade work, is what the majority have in their mind, and how many towns do not consider themselves well protected if they can boast of an efficiently manned fire-engine establishment. In reality the fire brigade as such has but a minor rôle in a rational system of protection. Really well-protected towns owe their position in the first place to properly applied preventive legislation based on the practical experience and research of architects, engineers and fire experts.

Fire protection as I understand it is a combination of fire protection, fire combating and fire research. Under the heading fire prevention I class all preventive measures including the training of the public, and under the heading fire combating I class both self-help and outside help.

Preventative measures may be partly contained in the Local Building Act and partly in a separate code of fire-survey regulations, if necessary supplemented by special rules as to the treatment of extraordinary risks such as the storage of petroleum, the manufacture of explosives and the performance of plays. The training of the public I speak of may be simply such as can be quite informally commenced at school and then continued by official or semi-official warnings, and a judicious arrangement with the ever-powerful Press as to the tendency of their fire reports.

I am not speaking in the abstract, as such forms of training have already been successfully introduced. I know of towns where the authorities have, for instance, had some of the meaningless fables of the Board School "Standard Reader" replaced by more instructive ones, which warn children not to play with matches, and teach them to run for help in case of an emergency. There are quite a number of municipalities where regular warnings are issued, to take an instance again, every December, as to the dangerous Christmas-tree. In such places every inhabitant has at least an opportunity of learning how to throw a bucket of water properly, and the nearest way

* A paper read by Mr. Edwin T. Sachs at the Society of Arts, Wednesday, December 5.



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to trip up a burning woman and roll her up without fanning the flames. The householder is officially informed where the nearest fire-call point is, and how long he must expect to wait till the first engine can reach his house. If he is a newspaper reader he will also have ample opportunity of knowing the resources of his town, and the local reporter's fire report will give him much useful information based on facts or hints supplied by the authorities.

I said I classed both self-help and outside help under my heading "fire combating."

The self-help I speak of mainly affects the protection of large risks such as factories, stores, public places of amusement, where it lends itself to regulation. The requirements of the fire-survey code may allow for the arrangement of hydrants in certain risks, and also for their regular inspection, and the means for self-help may be thus given. These means will, however, probably not be properly made use of unless some of the employes engaged on the risk are posted in their purpose, and have confidence in everything at their disposal. The possibility of proper self-help in dangerous risks may be encouraged by enforcing regular drills for the employes, and regular inspection as to their efficiency. There are towns where great reliance is placed on the efforts of such amateur firemen. In some cities they even receive extra pay, and are formed into units, properly uniformed and equipped, and retained by the fire brigade as a reserve force for great emergencies.

Self-help for the shopkeeper, the lodger, or the private householder can scarcely be regulated. The opportunities I mentioned a few minutes ago under the heading of public training would already assure an intelligent behaviour on the part of a large percentage of the community. I know places where, without any regulation being attempted, and thanks entirely to the influence referred to, most residences can boast of a hand-pump, a bucket, and a crowbar, the proper use of which is known to most of the household. Self-help in small risks may, however, be distinctly encouraged by the authorities, without any irksome interference with personal liberty, simply by the provision of street pillar-boxes, with the necessities of first aid, including perhaps a couple of scaling-ladders, and further, the arrangement of some opportunities for householders to learn how to handle them. Put a street-pillar of this kind in a fire-station, reserve certain afternoons in the year on which this elementary instruction will be given, and the students afterwards shown the fire-station or treated to a "turn out,"

and there will be quite a number availing themselves of the occasion. No matter if curiosity, real interest or wet days bring them there, the object in view is obtained.

When I speak of outside help I, of course, in the first place, mean organised outside help, and not simply such aid as is tendered by the casual passer or the neighbour. The link between self-help and outside help is the fire-call.

The efficiency of the fire-call depends not only on the instrument employed and its position, but also on its conspicuousness and the indications given to find its whereabouts. These indications are quite as important as the instruments themselves. The conspicuousness of the instrument alone does not suffice. Of the official notifications given in the Press, those of the position of the call points are among the most important. An indication at every street corner as to the direction to take to reach the point, or perhaps better, as I also know it, the conspicuous advertisement of the nearest call point over every post pillar-box and inside every front door, may enable even the veriest stranger to call assistance and minimise the chances of seconds being lost in search of the instrument. I will not now refer to the instrument itself. It is immaterial for the moment if the helpers are called by a bell outside a fire-station, by a messenger from some special messenger service, or if the call come through a telephone or an electric automat. Any instrument will do that insures the call being transmitted with a maximum speed and certainty, and in full accord with the customs of the country.

As to the organised outside help, it may not simply be limited to the attendance of the fire brigade. Special arrangements may be made for the attendance of the local police force, a public or private salvage corps, an ambulance, or in cases a military guard. Then I know of instances where arrangements are made for the attendance of the water and gas companies' servants, even officials from the public works office, insurance surveyors, and the Press. I know places where the salvage corps arrives on the scene almost simultaneously with the fire brigade. I know others where the police generally are on the spot in good force five minutes after the first engines. I know two cities where the ambulance waggon and the steamers arrive together. Another where the military authorities always send a fire piquet, which is turned out in ten minutes.

If all these auxiliaries come together, and no matter how high the rank of the individual commanders, the senior officer of the fire brigade, even should he exceptionally only hold non-commissioned officer's rank, must, however, have the reins, and

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his authority must be fully recognised. There are, unfortunately, not many places where this is the case, but I would lay stress on it that the efficiency of the outside help depends in the first instance on the clear definition of duties and powers of all concerned, the legal foundation, in fact; then on the organisation, the theoretically as well as practically correct executive; and, last, but by no means least, the prestige, the social standing, the education of commanders and their ability to handle men easily. For the rank and file of the fire brigade, clearheadedness, pluck, smartness, agility, will be as invaluable as it is dangerous to have reckless dare-devilry in the force, showy acrobaticism or the insane ambition for distinction.

Under the heading "fire research" I include all theoretical and experimental investigation as to materials and construction combined with the chronicling of practical experience in fires, then the careful investigation and chronicling of the causes of fires, assisted where necessary by a power of fire inquest for interesting, suspicious or fatal cases. I also include experimental investigation as to natural and accidental causes as distinct from criminal causes. Research for criminal cases may not only be assisted by a fire inquest as we understand it, but also by immediate formal inquiries held on the spot by the senior fire brigade and police officers present, or by immediate Government investigations held on the same lines as inquiries into explosions. As to the general research work, I would mention that there are several cities where, of late years, a number of experts have been regularly employed superintending a series of experiments on the resistance of iron, steel, wood and stone. Some towns have special commissions of experts who visit all big fires within a day's travelling, take photographs and sketches, and issue reports as to how the materials were affected. Then there are the usual statistics as to the outbreaks, their recurrence and causes, and in some places such tables are supplemented by reports on experiments on oil lamps, their burners and wicks, electric wiring, and the like.

I said fire protection to my mind consisted of fire prevention, fire combating and fire research, and I have tried to explain to the best of my ability what these headings cover. Before entering into detail, I should now wish to touch on the financial aspects of such protection and mainly its relation to the public purse.

Fire Protection and Fire Losses

We all know that property destroyed by fire is practically an absolute loss. This loss may only actually affect the owner, or it may be distributed among a number of people who are taxed for it in form of a contribution to their national or local fire fund, a share in some mutual insurance ring, or in the more usual insurance companies' premium. In the first two cases there are also some expenses to subscribe to in connection with the management of the fund or ring. In the latter case not only the expenses of management have to be covered, but also the costs incurred in running the insurance enterprise as such, and then a further amount for division amongst those who share the risk of the venture, in other words, the insurance company's shareholders.

We must here distinctly discern what is a loss and what is an expense. The sinking fund of the large property owner should cover a loss with a minimum extra expense; insurance in an extravagantly managed company paying large dividends will cover a loss, but with an unnecessarily large extra expense. In every case the loss remains, and as property may always be considered part of a commonwealth, the community, province, or nation, as the case may be, suffers. It is always in the interest of a nation to minimise its natural losses, no matter whether they fall on one individual's shoulders or on many, if such losses are good for certain trades or not.

With a suitable system of fire protection it is possible to bring these losses to a minimum, but this minimum would probably only be reached by an extra expense, which would fall heavier on the insurers' pockets in the form of municipal rates than the higher premium for the greater risk. A practical minimum is all that can be attempted, and that practical minimum varies according to circumstances. Most property owners would, I believe, grumble if a greater immunity from fire were to cost them much more than the danger. They would prefer a greater loss to an extra annual payment out of pocket.

Practical protection must mean smaller annual insurance dues, and the actual extra cost of this protection should be something less than the saving off these dues. Then the nation not only has a smaller dead loss, but the owner also has a smaller annual expenditure for his combined contribution towards the losses, the management of his insurance and the

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protective measures. Where there is mutual insurance or municipal insurance in its best sense, the losses by fire and the costs of the protection are often booked in one account, and the better protection up to a certain point should mean a smaller individual annual share. Where there is company insurance the municipal rates increase to cover the cost of extra protection, but the insurance premiums are expected to proportionately decrease. Competition and public opinion generally force this decrease of the insurance rates as soon as there is a greater immunity from fire, and where they do not, the appearance of that wonderful phantom called "municipal insurance" generally brings about the desired reduction. Where the insurance companies are well managed, and the shareholders are satisfied with reasonable dividends, protection can be said to find favour with all concerned, but if the protection is arranged for, and the companies do not do their duty, the result for the property owner is by no means a pleasant one. I unfortunately know several cases where property was greatly improved from the fireman's point of view, and the ratepayers supplied regular surveyors, and even a fire-watch, and yet the insurance company interested would not reduce its charge. Of course such tactics do not encourage good protection.

I may as well at once here touch on the question of insurance companies subscribing towards the maintenance of a fire brigade. The argument municipalities use is to the effect that the insurance companies derive all the profit from a good fire service, and should contribute towards its cost. Now, as just said, where properly managed companies have the business, a better fire service means a smaller premium to the ratepayer. If the ratepayer has to pay for extra protection in form of an increased municipal rate, or in form of an increased premium, raised to meet the contribution levied, surely it is simply juggling with figures. Of course I full well know that the contribution in the latter form helps to popularise the municipal budget, but surely this is not of any real account. Now this is all quite independent of any argument in favour of fire protection being considered in the same light as police or sanitary protection, which are everywhere held to be ratepayers' affairs in the fullest sense of the expression. We do not hear of municipalities in want of a popular budget asking burglary and life insurance companies respectively to contribute to the expenses of their police force or sanitary department.

To refer to the advantages and disadvantages of municipal insurance in connection with this study would be out of place,

and I scarcely hold the question to have any considerable bearing on the subject. At the most, to my mind such municipal insurance could only further the actual protection by the opportunity it would give the authorities to fully realise the extent of the losses and the effect of their efforts. Any saving accruing for the ratepayers owing to shareholders' dividends and other extra costs not having to be covered in the insurance premium should not affect actual protection. Of course, the municipal insurance premiums may be so figured as to leave the authorities a revenue which is devoted to protective measures. This again is, however, generally only done to reduce municipal rates and juggle with figures. The protection actually required remains the same, and the ratepayer will have to pay for it, no matter in what form.

I am no friend of municipal insurance if planned with the idea of obtaining a revenue from it, and I do not even hold a general fire insurance business to lend itself to official management. I, however, know a number of cities where the authorities limited themselves to taking house risks only, and most satisfactory results were thus obtained. In these cases the chief ambition was simply to insure a maximum distribution of losses, a rapid re-erection of buildings gutted, and an economising of insurance expenses. Mortgage transactions on house property were facilitated and a reduction of the criminal cases obtained.

The Cost of Fire Protection.

As to the actual extra cost of a practical system of fire protection above that of the more usual merely combative establishment, I can only say that where changes for the better were made, it was really astounding how cheaply the greater immunity from fire was obtained. In the first place, I would point out that the special fire clauses embodied in a Building Act would of course be attended to by the same executive authorities as would in any case superintend the general structural matters, and that the additional work would at the most require some increased clerical aid. If the execution of the fire survey regulations were delegated to the same authority, there would again simply be some extra clerical aid to pay for, and the salaries of perhaps a few extra surveyors. To make the inspections thoroughly efficient, it may be found advisable in instances to form parties of three for the rounds. The second man would, in this case, be a fire brigade officer, and the third probably a master chimney sweep, who would have to receive a special retaining fee.

The cost of the public training I referred to would be

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minimal, as the elementary part would simply be included in the schoolmaster's work, and the press matters could be easily managed in the fire brigade office. Payments would only have to be made for advertisements, such as the official warnings, lists for fire-call points, &c., and perhaps for the publication of semi-official hints. Self-help, as far as inspection and drills for amateurs spoken of are concerned, would be in the hands of the fire brigade. There would, however, be an extra expense for the purchase and maintenance of the street appliances I referred to.

The most expensive items in the system of fire protection undoubtedly come under the headings—fire call and fire brigade. As to the former, however, I would mention that there are quite a number of cities where the cost is modified by having the whole of the electrical service for police, ambulance and fire brigade, and even public clocks, managed by a separate municipal department. The same wires will call up each of these services, and as the same staff attend to their maintenance, the fire protection of a city need only be booked with perhaps a third of the outlay it would occasion if managed independently. The combined system has also the great advantage of facilitating the mutual working of the different services in case of an emergency. The call-point indicators which I have referred to, of course, also cost money, but here again, if the three services work together, the expenses on the count of fire protection can be lessened. Speaking of money rewards given in some cities to the individuals who first call the fire-engines, I would point out that such gratuities can become a heavy item, and I have some doubts if they in reality do much good.

As to the outlay on fire brigade establishment, I would here only say that I am a friend of systems which allow for a strong active force supported by efficient reserves. The latter should be as inexpensive as possible, but by all means at least a part paid and disciplined body which could be easily called in for emergencies. Fire brigade budgets cannot allow for an active force being ready for such curious coincidences as an unusual number of large fires starting simultaneously, but they must allow for an ample strength always being forthcoming for the ordinary emergencies, and this with all due consideration of the men's rest and possible sickness. An undermanned fire brigade is an anomaly which is generally fatal not only for the property owner, but also for the whole efficiency and *esprit* of the force. The budget must also allow for an attractive pay, for the profession is one which requires men who have a

maximum of the sterling qualities we look for among the pick of a nation. It must also not be forgotten that the fire service is one of the few where a system of pensions is the only fair way of recognising the risks of limb and health, and at the same time influencing that stability of a force in which the practical experience of long service is so essential. The budget must also not forget that an ample reserve of appliances is a necessity.

Whether the force should be so strong as to permit its having a separate section for salvage corps purposes depends on the circumstances. I at all events hold that, if a salvage corps is required, it should be part and parcel of the municipal brigade, organised on the same lines with a reserve, and this no matter again if the insurance of the locality be managed by the authorities or by the companies. If the corps is necessary, it matters again little if it be paid for out of premiums or rates. To my mind there would, however, not be very many towns where a special salvage section would find sufficient work, taking it for granted general protective measures are good, and that the tactics of the firemen are such as will give no occasion to fear an unnecessary water damage. Of further expenses which have to be considered there are items for fire research and fire inquest. If managed economically, due confidence being placed in the opinions of the fire officers and surveyors, there is no reason why the outlay should be great. The statistical work would only require some clerical aid. Where special coroners are retained for criminal cases some extra money will of course be required, but even here the costs need not be excessive, as there are many retired fire brigade officers and fire surveyors who are most suited for the work and would well be satisfied with a small emolument.

The last items I wish to enumerate are those for the water supply. There are but few places where special fire high-pressure mains are laid on in the interests of fire protection. As a rule the costs which are debited to the heading "Fire Protection" have simply to cover the maintenance of hydrants and tablets, or at the most the cost of the water actually used for fire-extinguishing purposes. Sometimes the cost of hydrants is shared with the scavenging department or the Commission of Sewers, who also have the use of them. Where the provision of water and hydrants falls to a private water company the property owners will, of course, be paying their share for them indirectly in the form of water rates.

Now you will have noticed that all the expenses referred to are such as to my mind fall on the public purse, and that I

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have not taken into account the actual cost of the better construction or arrangements which the Building Act and fire survey regulations would require. The property owner would have to cover this expense individually, but I shall not call it a special or extra outlay, as I consider stability, with due attention to sanitation and fire protection, should be the essence of modern building construction. Surely inferior construction not only shortens the life of a building, but it is also in every way detrimental to the interests of a *bona fide* investor. Safe construction enhances the value of a property, and the protective measures need not occasion much additional expense. Why not consider fire protection just as much a primary necessity for building as the block signal system is for railway construction. Is there much difference in abetting a man's death by fire and his death in a railway accident? Why consider it more legitimate to spoil your neighbour's property by fire than to steal it? Bad construction means a risk to one's neighbour's life and property as well as to one's own. It may not only cause a direct loss, but also spoil the man's business for years, and throw those out of employment who are dependent upon him. Why permit injuries of this kind?

Now, this is the first time I have in any way distinguished between the safety of life and the safety of property. The protection of property to which I may have seemed to be specially referring this evening must in any case include measures for the protection of life, as no fire can originate without there being some personal danger. It is practically immaterial if this danger affects the inmates or the firemen. The protective measures will stand good for both. Means for life-saving must be forthcoming as soon as possible after an outbreak had been signalled, as the helpers themselves may want them quite as much as those in or near the building attacked. It should also be remembered that both a good staircase and a ladder are often quite as useful for the manœuvring of the firemen as for life-saving purposes, and that they are practically quite as essential for the saving of property as for saving life. I do not hold that any distinction need be made between the two risks when speaking of fire protection in general, but as the safety of a single human life is apparently classed higher than that of the most valuable property, it may be well to give life saving the first place when alluding to the two separately.

Up to the present you will have noticed I practically only referred to the prevention of fires originating from natural

causes, negligence, or accident. Criminal fire raising may seem not to have had sufficient attention. Well, to my mind there is little or no criminal work where a perfect system of fire protection has been introduced. What with good construction and a fire survey, the quick arrival of the firemen, and careful inquests, the risks of detection are far too great.

(To be continued.)

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

22297. Andrew Barr, for "Improvements connected with windows."
 22308. Charles Gordon Picking, for "Improvements in bricks or blocks to be employed in the construction of the floors of fireproof and other buildings."
 22315. John Cæsar Craine, for "Improvements in window-sash fasteners."
 22350. Robert Lofthouse, for "Improvements in ventilators."
 22368. Gustav Czerwonkey, for "An improved roofing tile."
 22385. Thomas Curtis and William Charles Middleton Curtis, for "Improved Dublin pattern, valveless, silent, syphon flushing cistern for water-closets, latrines and the like."
 22418. Ada Mary Coleman, for "An automatic shut-off connector for taps, water and other pipes."
 22421. Albert Joseph Stannah, for "Self-opening doors."
 22495. Sidney Barwise, for "Improvements in lead pipes or tubes for conveying water or other liquids."
 22509. Edwin Thomas Howard, for "Improvements in flushing tanks and the like."

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BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BELFAST.—Dec. 10.—For Building Schools. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BERKHAMTSED.—Dec. 20.—For Building Stables. Mr. A. C. Meek, 237 High Street, Berkhamsted.

BEVERLEY.—Dec. 22.—For Additions to Constable's House. Mr. Beaumont, County Surveyor, Beverley.

BOLTON.—Dec. 21.—For Schools. Mr. W. H. Duisley, Architect, 20 High Street, Chorley.

BOSCASTLE.—Dec. 19.—For Additions to Schools. Mr. Other B. Peter, Architect, Launceston.

CARRICK-MA-CROSS.—Jan. 1.—For Additions to Donaghmoyne House. Mr. Logan, Architect, Dundalk.

FOREST GATE.—Dec. 18.—For Erection of a Block of School Buildings. Messrs. J. S. Newman & Jacques, 2 Fen Court, E.C.

HAYWARD'S HEATH.—Dec. 28.—For Alterations to Mortuary. Mr. Henry Card, County Surveyor, Lewes.

HOLLOWAY.—Dec. 20.—For the Erection of a Laundry at Workhouse. Mr. Wm. Smith, 65 Chancery Lane.

HORNCHURCH, NEAR ROMFORD.—Dec. 19.—For Tarpaving the Yards of Cottage Houses. Mr. F. J. Smith, F.R.I.B.A., 17B St. George Street, S.W.

IRELAND.—Dec. 22.—For Additions and Alterations to Donaghmoyne House, Co. Monaghan. Mr. R. P. S. Logan, Architect, Dundalk.

LLANEDDY.—Dec. 24.—For Building Arcade. Mr. W. Griffiths, Architect, Falcon Chambers, Llanelly.

LONDON.—Dec. 24.—For the Construction of a Brick Gas-holder Tank. Mr. Saml. White, 60 Queen Victoria Street, E.C.

MANCHESTER.—Dec. 14.—For Buildings in Connection with Main Drainage Works, Moss Side. Mr. J. Bowden, Engineer, 14 Ridgfield, Manchester.

MANCHESTER.—Dec. 31.—For Erection of a Municipal Technical School. Mr. Wm. Windsor, 37 Brown Street, Manchester.

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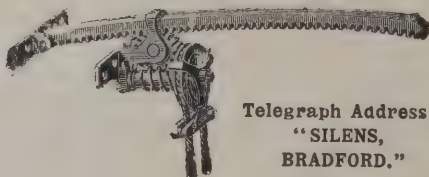
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MARKHAM & CO., Limited (accepted)	3,985	0	0

ERDINGTON.

For Erdington Sewerage Extensions, for the Aston Rural Sanitary Authority. Mr. J. E. WILCOX, Engineer, Union Chambers, Temple Row, Birmingham.

Contract No. 1.

Jones & Fitzmaurice, Birmingham	£1,588	0	0
S. Wood, Handsworth	1,290	0	0
J. White, Handsworth	1,270	14	0
J. Biggs, Birmingham	1,237	0	0
G. Trentham, Handsworth	1,148	0	0
Curral & Lewis, Birmingham	1,139	7	9
G. Law, Kidderminster	1,090	0	0
Cruwys & Hobrough, Gloucester	1,057	15	2
Holme, Leicester	1,031	9	6
H. HOLLOWAY, Wolverhampton (accepted)	960	0	0
Engineer's estimate	1,100	0	0

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For Construction of Sewage Outfall Tanks, Engine and Boiler-houses, Workmen's Cottages, Ejector Stations, and other Works connected therewith. Mr. GEO. S. HORTON, Engineer, Felixstowe.
F. BENNETT, Ipswich (accepted) £5,516 0 0

FOLKESTONE.

For Alterations to Windows and Doorways of North Board Schools, Black Bull Road, for Folkestone School Board. Mr. JOSEPH GARDNER, Architect, 2 Cheriton Place, Folkestone.

Grayling, Folkestone	£294	0	0
W. White, Folkestone	160	0	0
H. H. Holdom, Folkestone	155	0	0
H. Mercer, Folkestone	149	0	0
Petts & Son, Folkestone	125	0	0
R. WEBSTER, Folkestone (accepted)	113	0	0

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Hamilton & Co., slaterwork	86	18	6

GREENOCK.

For Repairs to Quay on West Side of West Harbour, for the Greenock Harbour Trustees. Mr. CRAWFORD, Engineer.

J. Bain	£675	0	0
G. Lawson, Rutherglen	608	16	0
Kerr & Melville, Greenock	559	18	0
Miller & Co., Greenock	546	9	0
G. HALLIDAY, Rothesay (accepted)	538	4	0

HASTINGS.

For Painting Engine House, Water Tanks, Water Carts, Sundry Girders, &c., for the Hastings Rural Sanitary Authority.

J. C. Kenwood, Hastings	£46	10	0
J. Stonham, Hastings	39	9	6
T. W. Pelling-Hurrell, Hastings	38	0	0
W. Roffe, Hastings	36	17	6
C. S. Hide, Hastings	32	15	0
Wellard, Hastings	29	15	0
F. Adams, Hastings	21	0	0
S. STEVENS, Hastings (accepted)	16	10	0

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For Supply and Delivery of 100 Lamp Columns, for the Vestry of St. Matthew, Bethnal Green. Mr. F. W. BARRATT, Surveyor.

Hill & Smith	£217	10	0
Lion Foundry Co.	212	10	0
C. S. Mallett & Co.	212	0	0
Cowlshaw, Walker & Co.	205	0	0
W. T. Allen & Co.	189	10	0
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J. Mowlem & Co.	284	0	10
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J. O. Richardson	226	12	5
J. STEED (accepted)	208	16	9

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For Kerbing and Tar-paving the Footpaths and Channelling and Metalling the Roadway of Queen's Road, Forest Hill, for the Lewisham Board of Works.

J. MOWLEM & Co. (accepted)	£695	0	0
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For Kerbing and Tar-paving Footpaths, South Side of West Hill, Sydenham, for the Lewisham Board of Works.

J. Mowlem & Co.	£323	0	0
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MARTON.

For Building Working-men's Club. Mr. F. H. GORST, Architect, 7 Birley Street, Blackpool.

Excavator and Brickwork.

G. Sparrow, Blackpool	£440	0	0
J. HILL, Marton (accepted)	379	10	0

Mason's Work.

J. Jackson, Blackpool	228	15	0
A. H. Dean & Sons, Blackpool	198	0	0
S. & J. WHITEHEAD (accepted)	192	0	0

Slater's Work.

J. KAY & SONS (accepted)	96	16	0
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Plasterer's Work.

C. HODGSON, Blackpool (accepted)	81	10	0
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F. W. Parkinson, Blackpool	126	10	0
J. Coulston	105	0	0
B. P. Smith, Blackpool	100	10	0
DODDS & LEVICK, Blackpool (accepted)	99	10	0

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G. Smith, Marton	431	0	0
Ainsworth & Bradbury, Blackpool	429	0	0
E. Saltonstall, Blackpool	365	0	0
J. NIGHTINGALE (accepted)	348	3	0

ORPINGTON.

For Additions to Stables at Sunnysdale, for Mr. George Grant. Mr. PERCY B. STRUDWICK, Architect, Bromley, Kent.

R. Harmer, Bromley	£130	0	0
T. Graty, Bromley	118	0	0
W. OWENS, Farnborough (accepted)	98	10	0

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Westcott & Crates, Penarth	£135	0	0
S. Pearson, Penarth	111	6	6
Escott & Ford, Penarth	89	10	0
T. Pearson, Cardiff	87	10	0
E. A. ACKLAND, Penarth (accepted)	86	10	0

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For Building Boys' School, Penrhiwceiber, to Accommodate 300 Boys, and Extension of Newtown School, Mountain Ash, to Accommodate Thirty-five Children, for the Llanwonna School Board. Mr. A. O. EVANS, Architect, Post Office Chambers, Pontypridd.

Penrhiwceiber School.

W. Williams, Pontypridd	£2,697	0	0
D. C. Jones & Co., Gloucester	2,636	0	0
W. Lissaman, Campden	2,600	0	0
T. Rees, Merthyr Vale	2,589	0	0
E. J. Davies, Cardiff	2,571	10	6
Williams & James, Pontypridd	2,384	10	5
C. JENKINS & SON, Porth (accepted)	2,300	0	0

Newtown School Extension.

C. JENKINS & SON (accepted)	275	0	0
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For Building Factory, Coxsides, Plymouth, for the Devon and Cornwall Rope Manufacturing Company, Limited. Mr. JAMES HARVEY, M.S.A., Architect, 9 Courtenay Street, Plymouth. Quantities supplied.

Julian, Truro	£498	0	0
Andrews, Plymouth	423	0	0
Palmer, Plymouth	423	0	0
Turpin, Plymouth	420	0	0
Warren, Plymouth	420	0	0
Roach & Lovell, Plymouth	413	0	0
Pearn & Sons, Plymouth	398	0	0
Cole, Plymouth	382	0	0
Blackell & Shepperd, Plymouth	369	14	0
Wakeham Bros., Plymouth	369	0	0
Blake, Plymouth	365	0	0

Revised Tenders.

Wakeham Bros.	314	0	0
Blake	307	0	0
BLACKELL & SHEPPERD (accepted)	305	0	0

PLYMOUTH—continued.

For Forming Flap with Lantern Light Over Bar, Swan of Avon, George Street, Plymouth, for Exors. of the Late J. Furze. Mr. JAMES HARVEY, M.S.A., Architect.

Exclusive of Painting and Glazing.

BLACKELL (accepted)	£40	0	0
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ROBERTS (accepted)	11	10	0

Additions to Fisherman's Arms, Lambhay, Plymouth, for Mr. W. H. Harris. Mr. JAMES HARVEY, M.S.A., Architect. W. J. ALLEN, Stonehouse (accepted).

For Supply and Fixing of Gymnastic Appliances in the Children's Playground, Beaumont Park. Mr. JAMES PATON, Borough Surveyor.

T. Cruwys, London	£191	18	0
Heath & George, London	130	0	0
E. Perriton, Plymouth	129	9	0
W. HEARDER, Plymouth (accepted)	88	16	6

ROTHWELL.

For Completion of the Market House for Use as a Public Library and Offices, for the Rothwell Local Board. Messrs. GOTCH & SAUNDERS, Architects, Kettering.

J. H. Vickers, Nottingham	£1,085	0	0
C. & F. Henson, Kettering	945	0	0
G. Henson, Wellingborough	890	0	0
A. Barlow, Kettering	865	0	0
G. V. Henson, Kettering	799	0	0
J. C. NEAL, Kettering (accepted)	753	0	0

SKESBY.

For Construction of System of Sewerage and Sewage Disposal Works, Skegby, for the Mansfield Union Rural Sanitary Authority. Mr. HERBERT WALKER, Engineer, Newcastle Chambers, Nottingham.

J. H. Vickers, Parkinson Street, Nottingham	£6,250	0	0
J. Greenwood, Mansfield	6,160	0	0
Holmes & Co., Chesterfield	5,750	0	0
S. & E. Bentley, Leicester	5,469	0	0
Holme & King, Liverpool	5,172	0	0
H. H. Barry, Radcliffe-on-Trent	5,107	3	0
J. Bradley, Lincoln	4,682	0	0
J. F. Price, Sherwood Rise, Nottingham	4,444	0	0
H. Vickers, Wilford Road, Nottingham	4,380	0	0
J. LANE, Skegby (accepted)	4,133	6	0



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For Construction of Works, for the St. Austell District Local Board.

Contract No. 1.			
Francis & Sons, St. Austell	.	.	£610 0 0
Contract No. 2.			
Duke, Plymouth	.	.	5,619 0 0
J. Shaddock, Plymouth	.	.	4,700 0 0
J. Julyan, Truro	.	.	3,689 0 0
B. Tyzzer, Watering	.	.	2,896 0 0
Ball, Mount Charles	.	.	2,768 0 0
J. Bunt, St. Austell	.	.	2,662 0 0
Thomas & Son, Crowan	.	.	2,650 0 0
Delbridge, Camborne	.	.	2,490 0 0
T. J. Smith, St. Austell	.	.	1,814 0 0

Mr. Smith omitted the cost of the two filter-beds from his tender.

WAKEFIELD.

For Eleven Cottage Houses, Clayton, Gaskell and Brighton Streets, Westgate. Messrs. HART & DAWSON, Architects, 21 Barstow Square, Wakefield.

Accepted Tenders.

Flowers Bros., Wakefield, builder	.	.	£848 9 4
S. H. Clarke, Horbury, carpenter	.	.	349 10 0
H. Lockwood, Wakefield, plumber	.	.	83 7 4
Pickles Bros., Leeds, slater	.	.	73 17 0
J. Platts, Wakefield, plasterer	.	.	71 11 10
G. R. Parker, Wakefield, painter	.	.	21 15 0

WALTON.

For Additions and Alterations at the Walton Board Schools, for the Walton-on-Thames School Board. Mr. F. LE ROSSIGNOL, Architect, 1 Gresham Buildings, Basinghall Street. Quantities by Mr. E. M. WHITAKER, Surveyor.

B. Ingram & Co.	.	.	£812 0 0
Dee	.	.	795 0 0
E. J. INGRAM (accepted)	.	.	688 0 0
Peters	.	.	665 10 0

For Additions and Alterations at the Hersham Board Schools, for the Walton-on-Thames School Board. Mr. F. LE ROSSIGNOL, Architect, 1 Gresham Buildings, Basinghall Street. Quantities by Mr. E. M. WHITAKER, Surveyor.

Dee	.	.	£1,123 0 0
B. INGRAM & Co. (accepted)	.	.	1,095 0 0
Peters	.	.	877 0 0

TRADE NOTES.

At St. Peter's Church, Eaton Square, a low chancel wall of Pavonazza marble, panelled in various coloured marbles, has just been completed by Messrs. Earp & Hobbs, of Lambeth and Manchester, preparatory to the erection thereon of an elaborately wrought metal screen, now in the hands of Messrs. Hart, Son, Peard & Co., of Drury Lane, W.C., and Birmingham. The work is from designs by Sir Arthur Blomfield & Sons.

THE Portishead Local Board has received the Local Government Board's sanction to borrow 14,000*l.* to carry out the works in connection with the proposed sewerage scheme, 12,000*l.* to be repaid within thirty years and 2,000*l.* within fifteen years. The works include eight miles of sewers of various sizes, a sea outfall, 136 manholes at an average depth of 11 feet 6 inches, about 100 iron ventilating shafts, air-compressing station with gas-engine, air-compressors, cottage for attendant, ejectors, air-mains, &c. Estimates will shortly be invited for the carrying out of the works, as it is proposed to commence operations without delay. Mr. T. J. Moss Flower, Assoc.M.Inst.C.E., Carlton Chambers, Bristol, is the engineer.

A PUBLIC inquiry is to be held on December 21, at Portishead, by one of the inspectors of the Local Government Board, the Portishead Local Board having asked permission to borrow 1,100*l.* to carry out private street works.

NEW schools are being erected for the Maesteg School Board from the plans and under the direction of Mr. E. W. Burnett, architect, Tondy, Bridgend, and will be warmed and ventilated throughout by means of Shorland's patent Manchester grates.

A NEW turret clock, showing time on four illuminated dials, has been placed in the tower of the Southport Infirmary by Messrs. Wm. Potts & Sons, of Leeds and Newcastle, the donor being Councillor W. Austerfield, J.P.

IN our issue of to-day we publish a letter from Messrs. Manlove, Alliott & Co., Limited, and in our next issue we propose to refer to Dr. Sergeant's patent, "The Incinerator."

THE patent Venetian window-blind, by the "Lux" Patent Venetian Blind Company, Limited, of Birmingham, deserves to be called the lightest, most perfect and cheapest Venetian blind. This blind is the result of many years' investigation and practical tests, and is produced by machinery specially

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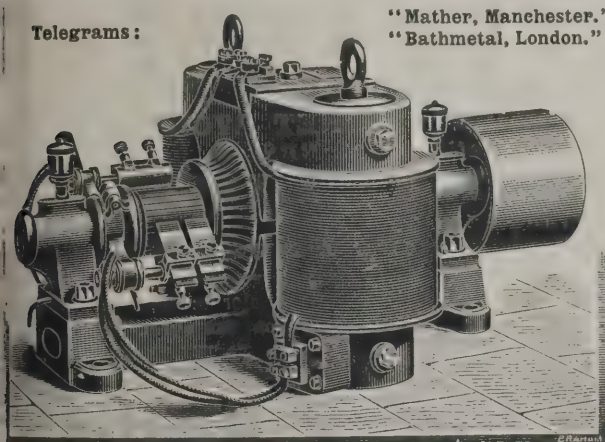
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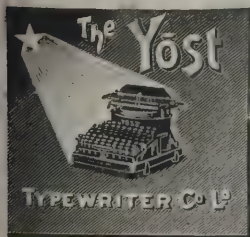
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designed, constructed and patented by D. Clarke, the inventor and patentee of the metallic Venetian blind, who is the engineer and managing director of this company. The laths of the "Lux" patent Venetian window blind are manufactured from a papraceous lignine, which is hard, tough and exceedingly light. They are corrugated in the direction of their length, which imparts to them great strength and at the same time secures a soft and subdued light in the apartment, which is pleasant and restful to the eye and the mind. The following are some advantages claimed for these blinds:—They are considerably cheaper than ordinary wood or metal blinds; they are less than half the weight of other venetians, consequently the strain upon the cords is lessened and the wear and tear is considerably reduced; being so much lighter, the carriage and freight are less in proportion; they are tougher and more elastic than wood, and the laths do not get out of shape as in metal blinds; they are finished in flatted colours, consequently there is no glare from the rays of the sun; the colour of the laths is the same right through their entire thickness, so they will not blister in the heat of the sun; they are non-conductors of heat, consequently the apartments in which these blinds are used will be cooler and more pleasant in summer and warmer in winter than they would be if the old-fashioned blinds were used; they impart a delightful and subdued light to the room, which is pleasant and restful to the eye and the mind; they do not occupy more than half the usual space when drawn up; new laths can be forwarded to replace the old wooden or metal laths cheaper than the old blinds can be repainted; being made by machinery, they are regular in their formation, and can be supplied in two-thirds less time than ordinary venetians; they are produced in one quality only, no second or inferior quality is manufactured, as in the case of wooden blinds.

We have received from the Sun Insurance Office, Threadneedle Street, E.C., their issue of Christmas novelties, in the shape of calendars for desk, wall and pocket; blotter, &c. We cannot do more than commend the company for the good taste which characterises these novelties.

NEW underground conveniences, carried out from the designs of Mr. J. Patten Barber, chief surveyor to the Vestry of St. Mary, Islington, have just been completed, the difficulties of designing them, owing to restrictions of space imposing limitations of area, having been well overcome by Mr. Barber. Separate entrance and exit staircases could not be provided,

but as cockneys generally go in by the exit and come out by the entrance staircase, it is a distinct advantage not to provide the double staircase. The work has been excellently carried out by Mr. George Jennings, from the instructions of Mr. Barber.

VARIETIES.

THE Sanitary Institute held an examination for inspectors of nuisances on Friday and Saturday, the 7th and 8th inst., when 112 candidates presented themselves.

AT the meeting of the Institution of Civil Engineers on the 4th inst, Sir Robert Rawlinson, K.C.B., president, in the chair, eight members, 130 associate members and four associates were balloted for and duly elected. It was announced that 102 candidates had been admitted by the Council as students of the Institution.

AT a public meeting held in the Town Hall, Wokingham, it was unanimously resolved that there should be a memorial erected in memory of the late Mr. John Walter, of Bearwood, and a committee was appointed to report on the form that should be adopted.

THE Edinburgh and District Water Trust have approved of a Bill which they propose to promote next session, bringing in an additional water supply from the Talla at a cost of 631,000*l*.

THE works of Messrs. T. Parker, Limited, which have been erected in Wednesfield Road, Wolverhampton, have been opened. The buildings and machinery are of up-to-date character, and the establishment will give employment to a large number of workpeople in manufacturing appliances for producing what has been designated the light of the future. The structure consists of erecting, fitting, pattern and machine shops and a foundry; and while the erecting shop has a length of 150 feet, the foundry has a length of 120 feet and a width of 40 feet.

THE SURVEYORS' INSTITUTION.

AT the meeting of the Surveyors' Institution on Monday evening, Mr. William Sturge, past president, read an elaborate paper, full of statistics, on the burdens on real property and land. There was a large attendance, and the lecturer's con-

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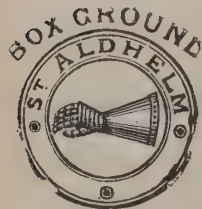
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clusions seemed to meet with general assent. Mr. Sturge reviewed the question of the burdens on land, or rather, in its more extended sense, the burden of taxation on real property as distinguished from personalty. The inquiry, he said, was of special importance at the present time, when the Legislature had taken a new departure, and laid upon real property a very serious additional burden, in the face of severe and increasing depression on that large proportion of real estate which consisted of agricultural land. It might be roughly estimated that agricultural land was now paying tenfold more than it would pay if urban property and personalty paid their full share. The owner of a large estate had duties to perform and charitable calls to meet, which he could not ignore, but which the plutocrat might, if he pleased, entirely escape. The removal of the exemption of real property from the death duties, without a fair adjustment of the local rates between real and personal estate, had inflicted a flagrant injustice on the owners of real property. The effect could not fail to be felt throughout the entire community. In too many cases the manor-house would be closed; the labourers would swell the numbers of the unemployed in the great cities, the tenantry would find less money laid out in repairs and improvements, the tradesmen in the market town would complain of dull trade and reduced profits—in fact, the very classes in whose favour the new system of taxation had been adjusted would indirectly feel its effects as well as those on whom they would more directly fall. Sir Richard Paget, Mr. E. P. Squarey and Mr. F. K. Munton took part in the discussion.

PANIC PREVENTION.

In reference to the lamentable mischance which occurred in Belfast on occasion of a children's entertainment in a school-room, in which, we regret to say, four children lost their lives through panic owing to a stampede, it is an opportune moment to call attention to those who have successfully catered for providing public buildings, schools, &c., with safety fittings. The lamentable disaster could not have occurred had the Tom Jones automatic panic bolts been used. These are manufactured by James Gibbons, of 9 Southampton Row, London and Wolverhampton, at such low prices for all kinds of doors that it is surprising they are not universally used in all buildings where the public congregate. These safety fittings are so uncostly that there can be no excuse

for their not being adopted, and no church, school, theatre, music-hall, or public building of resort should be without them. We could mention numerous buildings which possess them. Among a few buildings where the "Tom Jones" improved automatic panic fittings have been supplied and fixed are the following, these fittings also having gained the approbation of the County Council:—Covent Garden Opera House, Drury Lane Theatre, People's Palace, Avenue, Grand, Sadler's Wells, Queen's, Marylebone, Holborn Restaurant, King's Hall, Eden, Niagara in London, Kilburn Town Hall, Balham Town Hall, Battersea Town Hall, Plough Music Hall, Seabright Music Hall, Lewisham Baths, Wolverhampton Theatre, Burnley Theatre, Clapham Assembly Rooms, &c.

WEMBLEY PARK TOWER.

AN extraordinary general meeting of the Tower Company (Limited), who are the ground landlords of Wembley Park, was held last week at the Charing Cross Hotel for the purpose of considering the position of the Metropolitan Tower Construction Company (Limited), and, if deemed advisable, to sanction financial assistance being granted to that company. A letter from Sir E. W. Watkin was read, expressing regret that he did not feel equal to make a journey to London to attend the meeting, but at the same time he hoped that the Tower Company would sanction the creation of sufficient capital to enable the Metropolitan Tower Construction Company to complete the Tower to its first platform, when the Tower might be opened and worked at a profit. He added his strong opinion that it would be to the benefit of the Tower Company to secure the completion of the Tower. The total capital of the Metropolitan Tower Construction Company, the Chairman added, was 100,000*l.*, which had all been issued, called up, and spent upon the Tower in Wembley Park. The Tower Company were advised that to complete the Tower to its first platform, which would be at a height of 155 feet, the sum of 35,000*l.* would be required. Owing to the ground belonging to the Tower Company, there was no security upon which the Metropolitan Tower Construction Company could raise any further money. The 2,000*l.* a year ground rent was, however, a very important matter to the Tower Company, and it was therefore to the interest of the shareholders in that company to assist in the completion of this work to at least its first platform. It was not for him to discuss

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

COAL GAS.

ORDINARY BURNERS, 50 calories per candle per hour.

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whether the Tower ought to have been commenced, for now that 100,000% had been spent upon it there was no alternative but to complete it to the first platform. He therefore moved a resolution altering the Articles of Association of the Tower Company so as to enable it to pledge its credit in order to secure the raising of the sum required. The resolution was carried. In reply to a question as to whether there was any prospect of completing the original designs of the Tower, the Chairman said that he believed that when the Tower had been completed and opened to its first platform, it was intended to issue a prospectus to the public, and with the money thus subscribed it was proposed to pay off the debentures and provide a working capital for the completion of the Tower. In answer to other questions, the Chairman said that the Board would consider the advisability of calling up the outstanding liability upon the Tower Company's shares, which would provide 14,000%.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

THIS Society paid a visit to the works of the East London Water Company at Lea Bridge and were kindly shown over by the chief engineer, Mr. W. B. Bryan, M.I.C.E., the various engine houses, turbine houses and other works of this ancient water company. The members inspected four Cornish pumping-engines and a new set of triple expansion overhead marine type pumping-engines, two compound horizontal pumping-engines and four Hercules turbines used for pumping. The members were also shown a rotary pump made by the Drum Engineering Company, working under a head of 200 feet, which had been tested and was stated to have yielded an efficiency of 80 per cent., many and various apparatus for facilitating communication between districts, the working and governing of the engines and pumps, amongst these being notably that of the electrically worked stop-valve, and many ingenious contrivances designed by Mr. W. B. Bryan. The members were also shown over the new boiler house, inspected the sluices, the tubular aqueduct over the canal, and had a very interesting description given to them by the engineer of the working arrangements of the company, the difficulties met with and overcome in obtaining water from their wells, and also were shown some of the original receipts of Messrs. Bolton & Watt for money paid to them at the end of last century for coal saved by those pumping-engines that had been erected by them. Among those

present were Messrs. C. T. Walrond, C.E. (the president); R. Booth, C.E.; Rowan, C.E.; Kuhne, C.E.; E. H. G. Brewster, C.E. (hon. sec.); A. Wollheim, C.E.; J. F. Reade, C.E.; W. M. Binny, C.E.

OLD SANITARY FITTINGS.

ON Monday, Mr. E. W. Hudson appeared in answer to an adjourned summons at the instance of the Vestry of St. Mary, Battersea, in respect of his premises at 29 Kersley Street, which were stated to be insanitary by reason of the soil pipe being improperly constructed and terminating too close to one of the windows. It was stated that the system of drainage had existed at the house for twelve years, and when constructed it was in accordance with the latest sanitary requirements. A similar system was in force at New Scotland Yard. Mr. Pilditch, consulting architect to the Duke of Bedford and sanitary engineer to the Marquess of Salisbury's estate, proved having made an examination of the soil pipe to which exception had been taken and failed to discover the existence of a nuisance. It was not the best form of drainage. Mr. Gower, for the defendant, argued that the vestry had no power to interfere, as they had already sanctioned the existing system of ventilation. Although medical scientific discovery had advanced, the vestry, he contended, could not compel private owners to keep property up to the standard required by each new discovery. The drain could not possibly be more dangerous now than it was before science discovered its injurious effects. It was unfair to place owners at the expense of alterations because the vestry had got hold of new sanitary notions. Mr. Young, for the vestry, pointed out that it was the duty of the sanitary authority to enforce necessary sanitary requirements in the district over which they had jurisdiction. He was unable to say that there was a nuisance, but a nuisance was likely to occur at any moment. The vestry could not defer action until an outbreak of fever occurred. Mr. Denman declined to hold that sanitary fittings were likely to produce a nuisance because they were not up to date in sanitary science. If that contention were allowed it would mean that all old fittings would have to be pulled down and replaced. It was impossible to think that the Legislature in passing the Public Health Act had any such intention. He dismissed the summons, but nevertheless thought that a temporary imperfection in the pipe should be remedied. He allowed three guineas costs.

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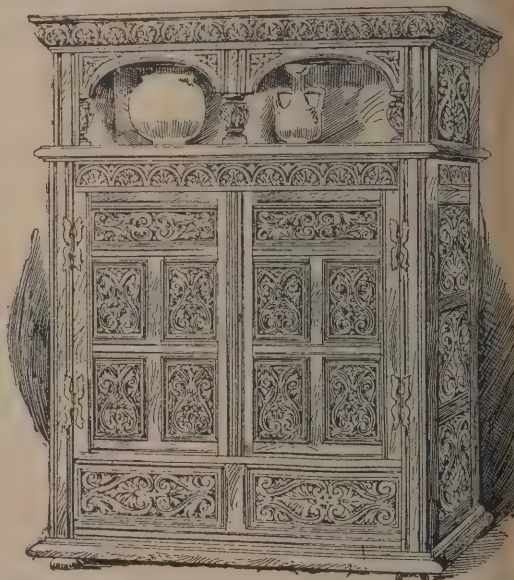
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A DOORWAY BY GRINLING GIBBONS.

FIRE PROTECTION.*

(Continued from last week.)

Fire Prevention.

UNDER fire prevention I first referred to the special requirements of the Building Act. The clauses can greatly influence the safety of life by requiring practical exits and sufficient staircase accommodation. I cannot here specially refer to the risks in theatres and assembly halls, which to my mind require separate legislation; I simply speak of factories, offices, business premises, hotels and tenement houses. In no case should any inmate of a building be further away from a staircase than 60 feet, and preferably there should be two staircases at his disposal in the event of one being blocked. Generally attention is only given to the construction of staircases; I would point out that their ventilation is equally important. Smoke is even a greater danger than fire, and can hamper the helpers terribly. The possibility of opening a few windows has saved many a life.

As far as the protection of property is concerned, the prevention of outbreaks can be influenced by the careful construction of flues, hearths, stoves, and, in certain classes of buildings, by the construction of floors and ceilings, the arrangement of sky-lights, shutters and lightning conductors.

Then comes the prevention of the fire spreading, first, by the division of risks, secondly, by the materials used in construction. I believe that one nation always speaks of "slow

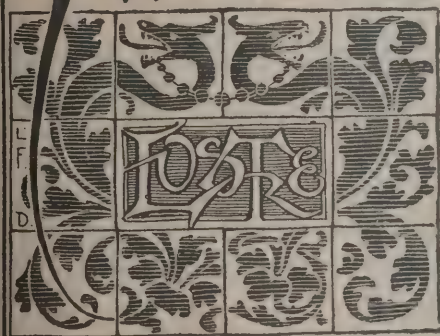
combustion buildings," an excellent term, as the expression "fireproof" is a misnomer, and "fireproof" buildings are impossible for practical purposes. When I speak of the division of risks the legislator's first ambition must be to prevent fire in one house spreading to another, and a stranger's property, so to say, being endangered. This is quite possible, given good party walls carried well over the roof to a height regulated by the nature of the risk, the arrangement of shutters to windows where necessary, or the use of fire-resisting glass. Either a thoroughly good roof, or even better yet, a fire-resisting attic floor can do much. If the locality has a proper fire brigade and the force is decently handled, "spreads" from one house to another can be absolutely barred. In the most dangerous class of warehouse property I have seen party walls which do not only project above the roof, but in front of the façades of the building. This is perfection, though generally too expensive.

The division of a building or a large "risk" into a number of minor ones is only possible to a certain extent. I do not hold with spending enormous sums trying to make each of the minor "risks" impregnable. My ambition is simply to try to retard the spread for a certain limited time after the flames have really taken hold of the contents. In those minutes most fires will have been discovered and a sufficient number of firemen can be on the spot to localise the outbreak and prevent the conflagration being a big one. Take a drawing-room in an ordinary well-built house. If the joists are strong and the boards grooved, and if some light pugging be used and the plastering properly done, if the doors are made well-fitting and fairly strong, a very considerable amount of furniture and fittings can be well alight for half an hour before there is a spread. In a warehouse or factory "risk" the same holds good. With well-built wooden floors, thickly pugged, and the ceilings perhaps run on wire netting instead of on lathes, with ordinary double-ledged doors safely hung, at the most perhaps lined with sheet iron on asbestos cloth, a very stiff blaze can be imprisoned for an hour. The general mistake of expensive iron and concrete construction is its aptitude to allow some breach being easily made through which the fire spreads. The iron door bends and so does girder-work. Then, again, directly a fire has got a hold these composite floors are much too dangerous for firemen to work on or under. They cannot get near enough to the actual seat of the fire. Further, if a strong stream of water touches the hot iron there is often an extra danger which can only be rivalled by the effect of a falling

* A paper read by Mr. Edwin O. Sachs at the Society of Arts, Wednesday, December 5.

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weight which also so easily brings about a general collapse. Then after the fire has been extinguished the ironwork will be so damaged that it will require entire renewal, and the brickwork will probably be so strained and bulged that the re-erection will have to commence from the footing. A simpler construction is in most cases the most satisfactory, and I should generally advise it as an architect. The few iron and concrete floors, for instance, which will stand some strain are to my mind too expensive to allow their introduction for fire protection alone, and when I speak of their cost, it must be remembered that it is not only the expense of the floors which have to be considered, but that also of the supports and the surrounding walls.

When speaking of the division of minor "risks," the dangerous lift wells, skylights, and shaft openings should not be forgotten; the latter should be as small as possible, well armed with shutters; the skylights should again have fire-resisting glass, and the lift not only vertical doors but also horizontal flaps, which would cut up the well into sections.

Division of "risks," common sense construction and proper staircase accommodation are really all that fire protection requires, and where the special Building Act clauses have been kept within the lines I have indicated there has been little friction and discontent. It is only when, as I have known it in a city that, for instance, a tenement house is always required to have a large passage-way, through which a fire-engine could gallop into a courtyard, that the property owner very rightfully considers himself harassed by the protective measures.

As to the fire survey regulations, they should mainly prevent the actual outbreak of fire. In certain classes of risks fire survey can also increase the personal safety of the inmates, and the possibility of a fire spreading may be lessened. The provision of fire-escapes or ladders, and a regular inspection of their efficiency, will do so much, and the examining of a rusty door-catch may save a building. The actual preventative work of the surveyor will, however, mostly consist in the warning of property owners against temporary stoves standing on ordinary floor boards, sooty chimneys, badly hung lamps, dangerous burners and gas brackets fixed in risky positions. Self-help will be greatly facilitated by the judicious arrangement of fire extinguishing gear, and a like inspection of its efficiency. Hydrants and cocks must not rust, nor must the hose get so stiff that water cannot pass through it. Hand pumps and pails must always stand ready filled. In distributing such apparatus I would point out that one of the greatest errors generally made is to forget that the amateur fireman likes to have an easy

retreat if his efforts are unsuccessful. Otherwise he may not care to use the gear at all.

I would here like to refer to the chimney cleaning. In some countries, in case of a chimney fire the owner of the property is fined for not attending to his chimneys. In others the chimney-sweeps are also made responsible if the owner can prove that he has had his chimneys regularly cleaned. Another way of treating the matter is to have official sweeps, who have the same rights as the dustmen of certain places, and can enter buildings and clean the chimneys at certain intervals after due notice. The chimney-sweeps are then alone held responsible. In the case I have in my mind, the municipal chimney-sweep department always had several men ready for attendance with the fire survey officers, and there were also some at the fire-stations ready to turn out with the firemen to a chimney fire when required.

It is, unfortunately, quite impossible to-night to touch regulations governing the "special risks" I referred to. I will only here say that as far as the safety of the public in theatres and public assembly halls is concerned, attention, to my mind, should be chiefly given to the exits. Spread of fire and even its outbreak are secondary considerations. A panic caused by a suspicion of fire can be quite as fatal as where a conflagration is actually started. As to the petroleum storage in shops, I would give most attention to preventing any direct communication between the shop or cellar and the main staircase or the living-rooms. As to the lamp question, why not prohibit the sale of dangerous lamps and burners in the same way as the sale of dangerous food?

Fire Combating.

As to self-help, I would only add that complications must always be avoided, and that the amateur fireman, above all, must be drilled on the simplest lines. I am a great friend of competition where volunteer work is concerned, and have always found annual prizes to be a good investment. One thing, however, must be instilled into the amateur mind, and that is not to waste water, a sure sign of a lack of training. Of course, the drills must be on the same lines as those of the local brigade, and on no account should other gear be used for self-help than is generally customary in that force. When volunteers and regulars' work together the latter should always remember that the paid force are experts, but the regulars must also never have that ill-bred contempt for volunteer work so often noticeable among the vulgar or mercenary. Volunteers are volunteers who

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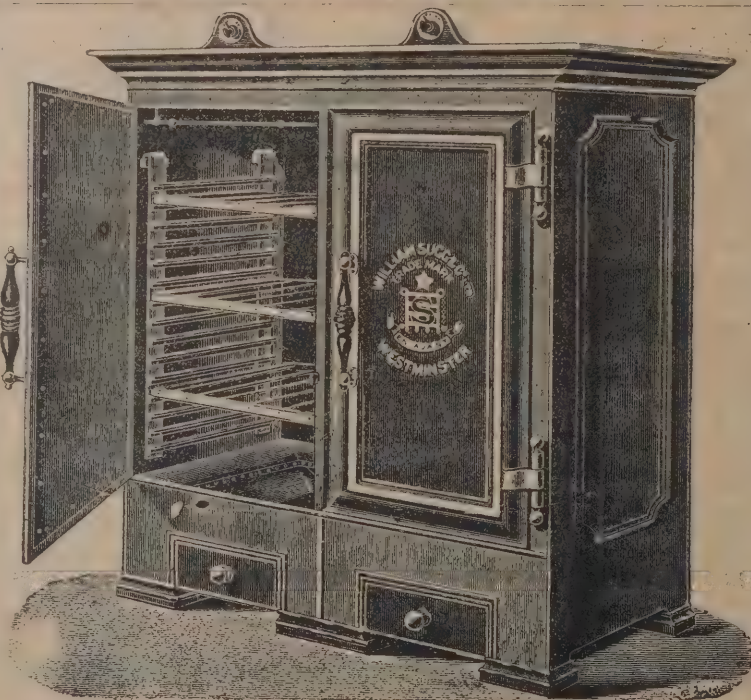
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are probably experts in some other vocation outside fire-fighting, and have not had the opportunities of a professional fire fighter.

There is one point still regarding self-help which I may touch on. There are authorities who dispute the advantages of both organised and independent self-help, and who prefer the immediate call of outside help only. These authorities remember the futile help of the amateur, and perhaps the door he opened which fanned the flames before there was a sufficient supply of water ready to counteract the effect. To my mind, where there is more than one helper at hand always see that the regular fire brigade is called, and where there is one man only, never attempt self-help if the fire is well alight, but call the engines. If the fire, however, is small, and engines cannot be had within a few minutes, even if alone always try self-help. Of course so much depends on the circumstances, and also on the temperament of the first comer. Excepting one or two countries, where the natives are all too excitable, I hold that self-help, both organised and unorganised, should be encouraged.

I must now give some minutes to the invaluable link, the fire-call. There are several methods of transmitting the message. The simplest is of course to run direct to the nearest fire-station, but this is only possible where the distance is only small. In one or two cities, however, the number of fire stations is so great that they are very close to one another, and hence what I will term "direct" calls are generally recorded.

Then comes the system of special messengers. The fire is reported at some public office, police-station or guard-room, where there are always runners ready to start off to the nearest fire-station. The special runner is of course practically here simply a makeshift for the more modern telegraph or telephone line, and the only city in which I know this system to be employed is one where the unsettled political atmosphere has compelled the authorities to prohibit the construction of any telegraph line other than those for the use of the general postal service. Similar messenger services have, however, also been introduced in connection with the telegraphic signalling system. I refer to the private enterprises known as general messenger or call-boy services, which are organised for business purposes, and have the advantage of the fire-call or the police-call thrown in. In the same way as a cab can be signalled, a call may come for a fire-engine, and the ever-ready runner makes off to the fire-station, instead of to the cab rank. As a rule, these messenger offices are near the fire-station. The combination is really rather a curious one, as it embraces the most advanced notions of giving every "risk" its own fire-call, and the some-

what antediluvian one of the special runner. I have often wondered why these messenger offices have no special wires to the fire-stations.

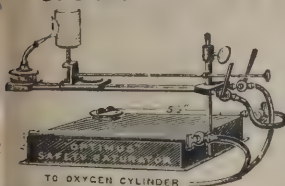
Another system for facilitating the fire-call relies entirely on the public telephone system, the terms of subscription to which may compel holders to forward fire messages, if required to do so. This system allows for such development as the payment of retaining fees to porters in public and other buildings which have a night service, on condition that the fire-call be promptly despatched. The telephones are perhaps even provided free, if they are not forthcoming; but it should be remembered that the service always goes through the General Telephone Exchange.

Then there is the special telephone line system, where special wires are laid on to buildings which are practically open all the year round, direct to their nearest fire-stations, and some payment is again made for prompt attention. Sometimes telegraphs take the place of telephones, but this requires the porter or attendant to be specially trained to the work. To simplify matters the buildings are sometimes fitted with automatic fire-calls instead of telephones, but the principle of the system remains the same. In districts where there are few public offices the list of buildings at which messages can be handed in have been frequently augmented by a set of bakeries or chemists' shops, where night service is not unusual. What I will term semi-public street-alarms come next. Automatic fire-calls are put up in the street, but their handles are under lock and key, and the keys are only distributed among policemen, watchmen, or householders, and the messages can, hence, only be given by persons known to the authorities.

The public automatic street-call is the last on my list. It is the simplest system next to what I term the direct message. Of course, I know that private automatic fire-calls or telephones can be laid on from dangerous risks, and there has even been an instance where an attempt was made to give every householder a private fire-call. This system is, however, unfortunately too extreme for the municipal purse. If in connection with some other paying enterprise, as in the case of the messenger services referred to, it would be a different matter, though it should also not be forgotten that too great a number of call points means a probable repetition of signals to the same fire. As every call should be answered, two separate fires quite easily occurring about the same time in the same neighbourhood, there is a risk of too many sections of the fire brigade being unnecessarily on the road to one fire.

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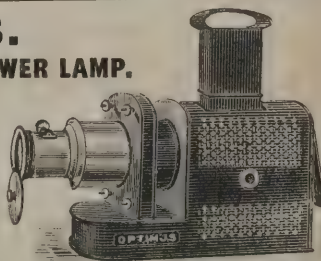
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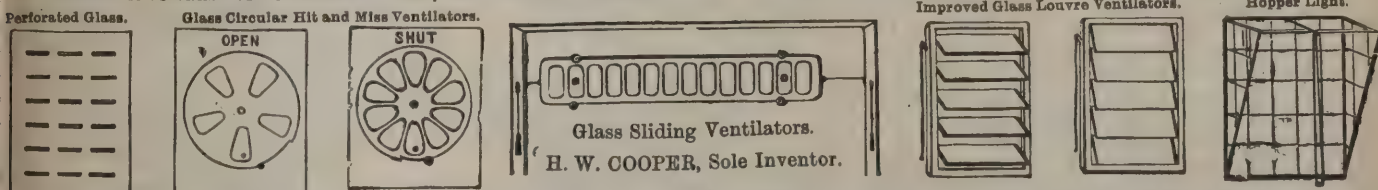


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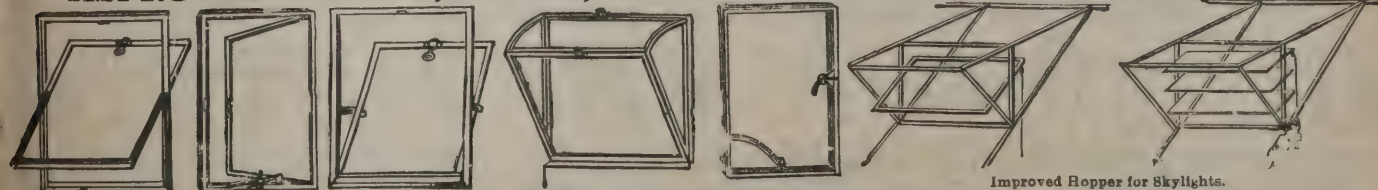


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As to the position of call points, they should not only be conspicuous, but they must also be in most frequented positions. Maybe, in some towns, a point in front of a church would be the best; in others, it may be more advisable to have them in front of a public house or cigar shop. It should always be remembered that every facility should be given to enable as many people as possible knowing the whereabouts of the call points without any distinct effort on their part. Red paint may make a call pillar conspicuous by day, and a coloured lamp is necessary by night.

As to the indication I spoke of, the plate on every letter-box as to the whereabouts of the nearest call point is perhaps one of the best. The letter-box is one of the most used instruments of a modern city, and the plate is hence read by many. In an oriental town the public fountain would however, of course, take the place of the letter-box. Plates put up inside every front door are somewhat extreme measures. In one city I saw small red darts painted on the glass of every street lamp indicating the direction to be taken to come across a street alarm. This sign, however, has the disadvantage of requiring a previous knowledge of its meaning. It is generally useless to a stranger in the town.

As to rewards paid to messengers, I know them to vary from one shilling to half a sovereign. In some places every call is rewarded; that is to say, also those to chimney fires, and this often results in an abuse. I have actually known rogues to light bogus fires on the top of a chimney, and then run to call the engines. If a reward be given, a limitation should be made. In one town I know no relation or employé of the owner receives a reward. In other cities no rewards are, for instance, given for calls to a fire in a dustbin or a chimney. As to the amounts paid, of course it depends on the value of money in the respective countries.

Here I must add a few words as to false alarms. No true fireman would be annoyed at a false alarm given by mistake. The possibility of a fire, or the suspicion of one, are *bona-fide* reasons for a call which should not be discouraged. Malicious alarms should, however, be treated with the utmost rigour, as the absence of firemen from their stations always means an extra risk to life and property. More, distant helpers may arrive too late. Combined lynch law with imprisonment has been adopted with good effect in one city I know. The rascal when caught was put over the pole of the engine and thrashed with a broad fireman's belt, and after that he was handed to the police. Hard labour has had much effect, especially also

inflicted on persons of position. Only a short time back the son of a well-known mayor had a month's hard labour for a malicious call, and there was at once an abatement of the evil. Fines are a ridiculous punishment for this kind of offence. They almost encourage the monied imbecile or ruffian. Where the punishment for malicious alarm is severe, there need be no recourse to the semi-public automat I spoke of, excepting perhaps in the veriest slums of a city.

The fire-call should, if possible, also be so constructed as to facilitate intercommunication between the scene of a fire and the headquarters of the fire brigade. Where the runner is employed or the telephone is used no special arrangements are required, but where the telegraph or automatic call point have been introduced, the apparatus must be adapted for this contingency. At some automatic fire-call points a few signals can be given, at others a telegraph or a telephone transmitter can be applied. Much valuable time may be saved in this way when more assistance is required. On the other hand, I again know towns that make a point to keep up a line of intercommunication for every fire, so that in case of an emergency part of the men in attendance there could be called away to help elsewhere. By-the-by, in some places the headquarters of a fire brigade are in communication with some watchmen on a neighbouring tower or steeple, who can signal any increase in a large fire by the change of light the blaze shows.

The organisation of fire brigades is most varied. As to the hours of duty there are brigades where officers and men are practically constantly ready to attend a fire, others where they are ready on alternate days, two days out of every three, or three days out of every four, and the off day is entirely their own, or at the most only partially used by the authorities for some light work. The men off duty are only expected to attend a fire if there is a great emergency. The brigade is strong enough without them for ordinary eventualities. Both systems can be worked with or without part paid or volunteer reserve. These would be only called out for great calamities. They could be organised as practically independent reserve force, or the reserve men might be attached to sections of the regulars and mixed with them when the occasion arises, in the same way as our naval reserve men mostly are. The reserves can either consist of retired firemen who have a few regular drills, or amateurs who have to go through a special course of training with some regular drills at intervals and preferably a short spell of service every year with the regulars. I prefer the reserves to be a distinct body. As regards the hours of duty



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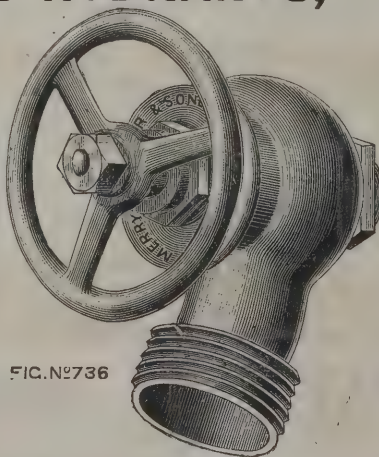
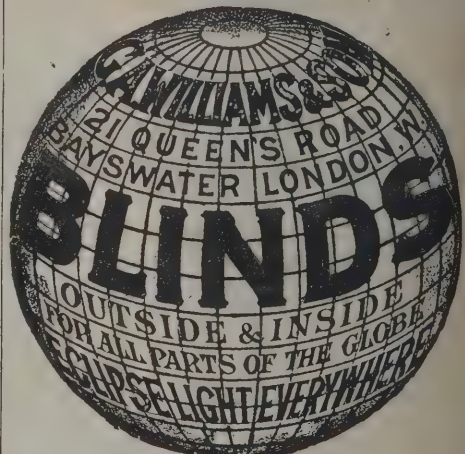


FIG. N2736

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As to the division of the active force it may be on a system of a number of small parties of twos and threes backed by one or more strong bodies. Another system allows for a division into sections of equal strength (so-called "units"), ranging from parties of say from five men with a non-commissioned officer to thirty non-commissioned officers and men with an officer. The force can of course also simply be divided up into parties or sections of different strength not governed by a system of military units; the sections or "units" can either work independently, simply governed by one central authority, or they can be grouped into minor or major bodies (so-called districts or companies), which are as a whole responsible to headquarters.

As to the officers, they may be all taken from the ranks, or they may be officers and gentlemen in the military sense who have only temporarily done work with the rank and file when in training. There could also be a combination of these two systems. Only the captain and deputy-captain might be officers in the military sense, the sections or divisions being officered by non-coms. Some cities have an officer to every thirty non-coms. and men, whilst others put a division of as many as two hundred men under a fireman who has risen from the ranks. Where protection is treated as a science, and where those in charge of a brigade have really to act as advisers to their employers, officers in the military sense have been found essential. They have also been found advantageous where their scope is limited to fire-extinguishing. The prestige of the fire service has been raised everywhere where the officers, besides being fire experts, are educated men of social standing. There are cities where the officers of the fire brigade are in every way recognised as equal to army or navy men, their social position is the same, and their mess fulfils the same functions as a regimental mess. The fire-brigade officer is recognised at court, and there is no ceremonial without him. On the other hand, there are also cities, with brigades several hundred strong, where the captain, who may of course be a very fine fellow, would, unfortunately, seem quite out of place in any recognised club-room. His social standing would only be par with that of a colour-sergeant. As to the primary training of a fire-brigade officer, I may as well say that the best men have generally had some experience in another profession, such as the army, the navy or the architectural and engineering professions previous to

their entering the fire service. Some brigades recruit from army officers only, and preferably from the Royal Engineers or artillery regiments; others recruit from among architects and engineers, subject to their having at least had some military experience in the reserve forces or the volunteers. Some cities always only take engineers or architects, and make a point of it that they should have no previous military experience. I hold that some previous experience in the handling of men is essential. Royal Engineers and architects of some military experience have, to my mind, nearly always made the best officers.

As to the men, there are cities where only trained soldiers are taken as firemen; others where the engines are manned by sailors. In some towns the building trades supply the recruits; in others, all trades are either discriminately or indiscriminately represented. I have generally found a combination from the army or navy and the building trades most satisfactory. The knowledge of building construction in the ranks does the force good stead, and has already saved both lives and property. Where a brigade can boast of a few men of each important trade much money has been saved the ratepayers by the men doing their own repairs and refitting, but the number of men from sedative trades should not be excessive. Where there are only men of one trade or calling I generally found too great an aptitude for one-sidedness, and a wonderful amount of prejudice.

(To be concluded.)

CONTRACTING FOR CORPORATION WORK IN GLASGOW.

At their meeting on the 27th ult. the special committee of the Glasgow Police Commissioners on Standing Orders had under consideration the motion submitted to the commissioners by Mr. Main, to substitute in lieu of standing order 16 as presently existing the following article, viz.:-

"No member of the commissioners shall by himself or by a firm or company with or without limited liability, of which he is a member or shareholder, contract or sub-contract for any goods or furnishings to be made or supplied, or for work to be done, to or for the commissioners. The foregoing prohibition of business dealings with limited companies shall be held to apply only to private companies which are here defined as companies whose shares have not obtained an official Stock Exchange quotation in Glasgow, Edinburgh or London, and as

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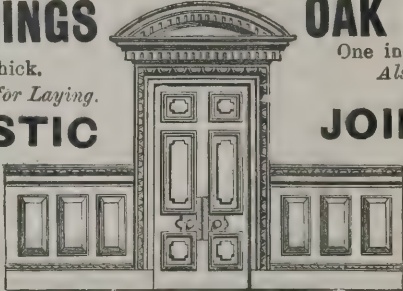
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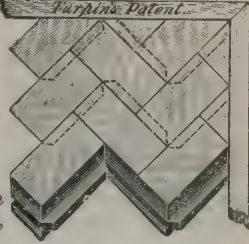
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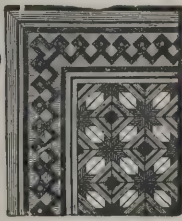
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regards limited companies which have obtained such Stock Exchange quotation, the following modified resolution shall apply, viz:—No committee of the commissioners shall have any transactions with any such company in which a member of committee is a shareholder, or accept from any such company of which a member of committee is a shareholder an offer to contract for any goods, furnishings or work to be made or supplied or done to or for the commissioners. Neither of the prohibitions in this standing order shall apply to shareholders in newspapers or in any railway company, bank or insurance company."

The committee having heard Councillor Main in support of his proposal, resolved, after full discussion of the matter, to recommend that the standing order as presently in force be adhered to, said standing order being as follows, viz:—

"No member of the commissioners shall, by himself or by a firm of which he is a member, contract for any goods or furnishings to be made or supplied, or for work to be done, to or for the commissioners. No committee of the commissioners shall have transactions with any corporate or limited liability company of which a member of the committee is a shareholder, or accept from any such company an offer to contract for any goods, furnishings, or work to be made, supplied or done to or for the commissioners—shareholders in railway companies, Scottish banks, insurance companies and newspapers excepted."

Mr. Main dissented from the recommendation. The committee also considered the following proposed addition to the standing orders by Mr. Garey, which was remitted by the commissioners to this committee on the 19th ult. :—

"No person who shall have been a magistrate or councillor shall be appointed to any office or emolument in the gift of the commissioners before the expiration of twelve months after he shall have ceased to be a magistrate or councillor."

After discussion, the committee agreed to recommend that the proposal be negatived, Mr. Main dissenting.

Mr. Main said that he wished the committee to take back the matter for further consideration, and moved that the committee should be increased.

Dr. Garey seconded.

Bailie Graham did not see why the matter should not be discussed now, and he moved accordingly.

This was seconded.

On being put to the meeting, thirty-one voted for the amendment, and twenty-four for the motion to remit the matter to the committee.

Mr. Main, in opening the discussion, said that this question was not a new question. The very principle which he was asking should be adopted was actually the finding of the Town Council two years ago. At that time Treasurer Gray declined to vote, or probably the present standing order would not exist. He saw no reason why he should participate in profits arising out of his connection with the Town Council, and he had such faith and confidence in the great majority of the members that he was sure they would affirm this principle. He moved that the motion standing in his name in the minutes should be adopted.

Dr. Garey seconded Mr. Main's proposal. As it was a recognised principle at that board that all members must be debarred from any position of profit or gain in connection with any of its transactions, the commissioners would be only consistent if they did what they best could in order to carry that principle into effect. Mr. Main's amendment simply detailed the principle already accepted. So far as the addition to Mr. Main's proposal which stood in his (Dr. Garey's) name was concerned, he submitted that it was only an additional detail to Mr. Main's amendment. He (Dr. Garey) did not claim to be the originator of the idea contained in his proposal. He found it in the standing orders of the Edinburgh Town Council. He did not pretend to say that the Glasgow Police Commissioners were in the same position as the Edinburgh Town Council were when the latter adopted it. When the idea first occurred to him he was not aware that any member of the commission was likely to come within the pale of its operations.

Treasurer Gray moved that the old standing order 20 should be adopted. It was to the effect that no member of Council should contract for any goods or furnishings to be made or supplied, or for work to be done to or for the Council, or should be concerned, directly or indirectly, in any contract with, or participate in any manner in the profits of any work to be done for or goods to be furnished to the Town Council. The common law of England, he said, was against any members taking Corporation work, directly or indirectly. He trusted they would revert to the position in which they were until the false charge was made two years ago.

Mr. Dickson seconded Treasurer Gray's proposal.

Bailie A. Murray asked Mr. Lang if Treasurer Gray's amendment, if adopted, would prevent the commissioners from contracting with a limited company of which one of the commissioners was a member.

Mr. Lang ruled that it was not competent for Treasurer

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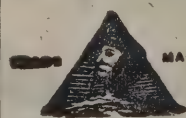
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Gray to introduce his motion as an amendment to Mr. Main's proposal.

Mr. Shearer pressed for an answer to Bailie Murray's question.

Mr. Graham pointed out that the discussion was irregular. Proceeding to support the minutes, he said that he did not think that it could be said of any member of the commission that the firm with which he might be connected had received any distinct advantage from the Town Council from the fact of his having been connected with that particular company.

Mr. W. F. Anderson said that he thought that if members were excluded from deriving profit from Corporation contracts, the rule ought to be binding all round. The Corporation ought to be above suspicion. He contended that the standing orders at present in force were abused, and urged that commissioners who were members of a private company, or of a company whose shares were not quoted on the Stock Exchange, had no right to sit at the Council board and derive a farthing of profit from any Corporation contract.

Mr. Crawford said they were trying to set up a standard of morality of their own which the law did not recognise. They were wasting their time in this discussion in making standing orders that went beyond the law of the land. Why, then, if they could not enforce anything, should they bother their heads about standing orders which, so far as they went beyond the common law, were absolutely ineffective and futile? He would ask Mr. Lang whether or not the statement he had made as to the common law was correct, and if so, why should they waste their time in minute criticism of the standing orders?

Mr. Lang remarked that Mr. Crawford's statement was correct.

Mr. Ferguson said that a court of honour was a higher court than a court of law, and he thought that the finger of scorn pointed at a man who would value his duty on such a matter after it had been resolved upon by his colleagues would be quite powerful enough to produce the desired result. He was thoroughly in sympathy with Councillor Main on this matter. He would like, however, to put himself right, and to ask a question. Supposing he sold paper to a stationer, and the stationer supplied the paper to the Council, would he (Mr. Ferguson) be unable to be upon the committee? He did not think so himself. At all events, he would like no dubiety about the matter. He had much pleasure in supporting Mr. Main's motion on a clear understanding on that point.

Mr. D. M. Stevenson asked if some of the gentlemen who

took Mr. Ferguson's view would tell them how to distinguish between a Stock Exchange company and a non-Stock Exchange company, because there were plenty of private companies quite as big as many Stock Exchange quoted companies.

Mr. James Dick thought that in all the discussion they had only been looking at one side, namely, the corrupting of the members of the Council by taking contracts. Mr. Main's amendment would certainly take from the Council the power of accepting contracts which even in a secondary way any member could be interested in. If such a condition was passed it was utterly impossible to carry through the work of the commission.

Mr. John Macfarlane remarked that Mr. Main had not grasped the meaning of his motion. A wholesale oil merchant who was a member of the Council might sell oil to a retailer who might sell it to the Corporation Tramways. The member would be unseated.

Mr. Main asked permission to make an explanation, and proceeded to make some remarks.

Bailie Graham rose to a point of order, and observed that Mr. Main was entitled to make an explanation, but not a speech.

Mr. Main pointed out that the case as instanced by Mr. Macfarlane was not prohibited by the clause.

A proposal was made to adjourn the discussion until the next meeting, but in reply to a question, Mr. Lang said that the matter had been fully discussed and should go to the vote.

A division was then taken on the portion of the minutes referring to Mr. Main's proposal, when thirty-three voted for the minutes, eighteen for Mr. Main's amendment, and nine declined to vote.

THE CHOICE OF AN ENGINE.

ON the 1st inst., at the meeting of the South Staffordshire Institute, Mr. J. W. Hall read a paper on "Conditions which Determine the Choice of a Steam-engine." He stated that the purchasers of engines were most apt to err in their choice under any given circumstances, either in paying too much attention to the first cost of the plant, to the exclusion of the other factors, or, less frequently, in considering nothing but the coal bill. The former error was more common in this neighbourhood, the latter in Lancashire and on the Continent. It was commonly taken for granted that a cheap engine meant a

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tolerably high fuel bill, and that to economise fuel a very costly engine was requisite. Did the cost begin and end with the engine, there would be some reason for this view; but the engine and boiler must be regarded as one installation, and the cost of the whole as the basis of comparison. It needed no proof that an engine using 60 lbs. of feed per indicated horse-power required very much larger boilers than one using only 15 lbs. for the same power, yet it was curious how often the point was lost sight of. The higher the pressure of steam a boiler would supply, the higher was the economy of fuel it was possible to obtain from it, the limit of increased pressure being determined by prudential considerations of safety, of first cost and wear and tear. The question of the best pressure to adopt was the first to be settled, as upon that everything else turned. This economical pressure was not the same in every instance, but it was in all cases steadily rising, as boilers more suitable for higher pressures were obtainable. The inclination to employ higher speeds, which, under suitable conditions, were also conducive to economy of fuel, was quite as noticeable as the tendency to work at high pressure; and now that most of the difficulties experienced in the earlier days—to which much of the prejudice still existing in many minds against high-speed engines was undoubtedly due—were successfully overcome by more suitable design and proportions, and the use of a better class of material, the original objections to them had entirely disappeared. No engine could be considered fit to run at high speeds which was not fitted with sight feeds, or at least continuous or automatic lubrication, to every bearing, by which it could be constantly supplied with oil while running for days and nights together, without any necessity to stop for greasing; indeed, as much care and thought was now spent by the designer on the lubricating details as upon any other part of the machine. As increasing the revolutions made by an engine in a given time increased its power in the like proportion, high speeds enabled smaller engines to be used for the work: and though doubling the speed did not quite halve the cost of engine per unit of power delivered, owing to the fact that higher speeds required larger bearing surfaces, the economy in first cost was very great. Of all methods of reducing initial condensation, the most practicable and convenient was the employment of the steam in a series of cylinders, whereby the range of temperature in each cylinder was much reduced, and condensation and evaporation brought down to a minimum; and experience proved conclusively that a compound

engine was in all cases, at all pressures likely to be employed in these days, more economical in the use of steam than a single engine using the same pressure and number of expansions. During the last ten years a type of engine, formerly almost unknown, had become very common, that was the compound condensing engine, which, particularly for engines of small size, proved exceedingly economical. It was very commonly assumed that a compound engine having two cylinders was necessarily a costly one, but for given power it frequently was cheaper than a single cylinder, and, seeing that the amount of steam consumed was less, the boiler might obviously be smaller. There was another important advantage in compound engines—namely, the much smaller relative loss of efficiency due to leakage past pistons and valves when the engine was worn. When an engine was liable to a sudden temporary demand for power much in excess of its normal output, a single cylinder met the difficulty well, and with the lowest first cost; but anything approaching economy was impossible in this case unless an automatic cut-off was employed. Marine engineers found that triple engines cost rather less to make than compounds, and they less again than single engines, reckoning boilers and everything in; while shipowners reported that the smooth running of the three-cylinder engine saved so much in wear and tear that they were less expensive to keep up.

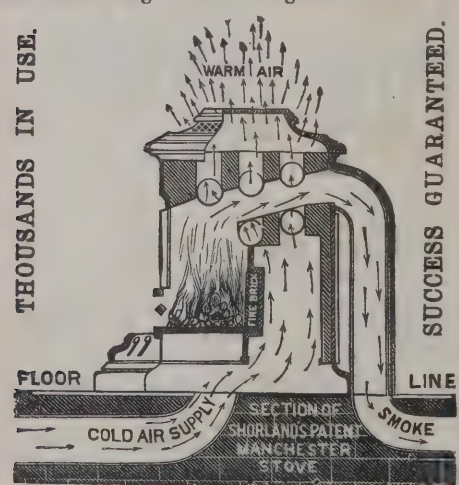
THE DRAINAGE OF HOWTH, CO. DUBLIN.

THE following report from Mr. Stoney, engineer to the Dublin Port and Docks Board, on the drainage of Howth, has been received by the Board of Guardians of the North Dublin Union, acting as the Rural Sanitary Authority:—

In compliance with your request that I should say whether I consider Messrs. Ross & Collen's plan for Howth drainage capable of being practically carried out, and fully effecting the purpose for which the plan was designed, I beg to report as follows:—As this reference extends the scope of the former one, it will be necessary for me to express my views at somewhat greater length, and, perhaps, more freely than otherwise I should have felt warranted in doing, in order to put you in possession of such information as this further question seems to demand. The drainage of the north side of Howth may be divided into two

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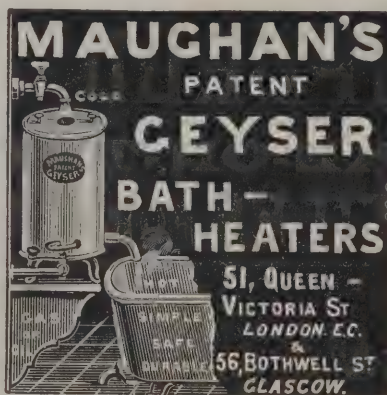
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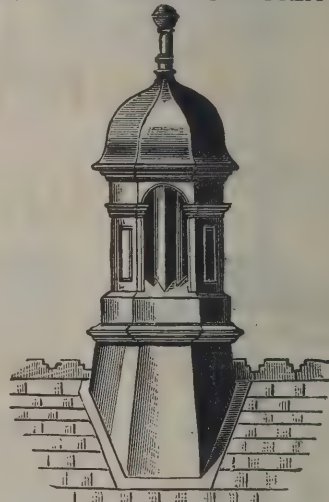
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distinct classes — namely, that of the villa residences, chiefly detached or semi-detached houses, built on the sloping hill side, and that of the town itself, mainly consisting of Fish Street and Main Street, the houses in which are, with few exceptions, not supplied with modern sanitary appliances, and the inhabitants of which for the most part throw their slops and refuse into the street in front of their dwellings. The slops flow down the water-tables into the nearest gully-trap, and the more solid refuse is removed by carts. Any new system of drainage in Fish Street will do little to alter the existing outward state of affairs. The inhabitants will still throw their refuse and slops into the street, and to ordinary observation there will be no appreciable change. The only alteration will be that the present underground system of drainage will be modified, and I doubt if it is worth going to immediate expense for this change. Under these circumstances frequent cleansing of the thoroughfare is fairly good practice, and should be carefully attended to. If this view be adopted the new sewer in Fish Street will be eliminated from any immediate scheme of drainage. My own experience of Howth (extending over several years) leads me to say that the better class of houses are the chief offenders. From these, especially when furnished with water-closets, considerable quantities of noxious slops are discharged, and these generally find their way into the nearest watercourse, contrary to the Rivers Pollution Prevention Act, and it is not pleasant to see milch cows drinking such polluted water, or that our senses should often remind us that civilisation is not unattended with certain dangers to which our ancestors in primitive times were probably much less exposed. Having premised so far, I shall now return to the plan of Messrs. Ross & Collen which, in my first report, I said I considered the best of the four competitive designs; and here I may observe that competition rarely produces a very complete or final plan, especially when the prize is insufficient to warrant much expenditure in its preparation. You have, however, in the selected plan the nucleus of a good system of drainage, and when further labour is spent on details the resulting modifications will doubtless greatly improve the design. Some of these I have mentioned in my former report. I may now add that I think the line of sewer between Cannon Rock House and the entrance gate of Nashville Park may advantageously be diverted to the public car road leading from Cannon Rock House to Main Street. First, because the line shown on the plan will be nearly entirely in rock cutting; secondly,

because villa residences are much more likely to be built close to the public road than close to the line shown on the plan; thirdly, it will fit in better with the drainage of Main Street. Next, I think it probable that the drain along Boggeen Lane can be omitted, for careful examination may show that the sewerage from the direction of Rosemount to Springmount can be carried into Boggeen Road sewer, which joins the main line of sewer from Kitestown to the sea. Again, I think that probably the direction of the outfall might be slightly altered with advantage; but, as I have already suggested, your engineers will, on more careful examination, doubtless find several matters capable of improvement — matters on which I have not sufficient information to enable me to express an *ex cathedra* opinion. What I wish, however, to convey is that the villa residences are the houses which create the chief nuisance, and if these are provided with public sewers it will be easy to drain Main Street also, leaving Fish Street alone for the present, at all events. Main Street sewer also can be readily flushed throughout from the Boggeen brook. I have heard the opinion expressed that an open sewer is less unhealthy than a covered one. I do not agree with this, but that perhaps is a matter of taste. At all events, the system of cesspools which largely prevails in Howth is not unattended with danger, especially if wells are in their vicinity, and though the inhabitants claim exemption from typhoid and other sewage diseases, and are, with reason, proud of the purity of the air, this should not prevent precautionary measures being taken in time, and before there is a much greater increase of villa residences, for it is rather late to set one's house in order after a pestilence has broken out. In conclusion, I may remark that no sewage scheme ever is perfect, and it would be absurd to expect a rural sanitary authority to provide means for draining every house within an improved district. To illustrate this I may refer to Mr. Sydney Wright's house at Kilrock. This charming villa is so far below the probable level of a sewer in the road above that it is expedient to let it continue to drain directly into the sea as at present. Somewhat similar cases will occur elsewhere, where an isolated residence may be allowed to continue its present system rather than incur large expense in order to carry out a theoretically perfect system of drainage. I think, therefore, I may say that the selected plan, when modified as I have proposed, and with such improvements as further investigation may suggest to your engineers, is capable of being practically carried out and effecting the purpose for which it was designed.

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INSTITUTION OF JUNIOR ENGINEERS.

At a meeting of this Institution held on December 7 at the Westminster Palace Hotel, Victoria Street, Mr. H. J. Young in the chair, a paper on "Waterworks and their Appliances" was read by Mr. William Mallock. There was a large attendance of the members.

Dealing first with source of supply, the author described generally the formation of the soil over or through which the rain passed on its way to the two classes of source—above ground and under ground, and reference was made to the systems adopted by the larger cities throughout the kingdom for obtaining their supplies. Diagrams were exhibited showing the arrangements and appliances in connection with London waterworks for well-sinking, boring and driving headings into the chalk to the underground sources. The supply derived from London wells was gradually being exhausted, as was proved by their fall of water-level to the extent of 10 inches average per year; the above-ground source of supply would, however, be sufficient for many years to come. The geological formation of the Thames watershed, comprising an area of 3,500 square miles, was described, from which it was noticed how, on account of the extensive natural filtration it undergoes before passing to the river, the Thames water was so much purer than the river waters of the north country, where the soil was generally impervious and therefore unfitted for filtering purposes.

In considering the question of storage, to which great importance was attached, various schemes were investigated applying to London, including Hunter & Fraser's, which had been accepted by the Royal Commission, and a proposal of the author's, whereby pumping expenses would be avoided and other advantages obtained.

A detailed account followed of the latest practice in regard to the different appliances in connection with the processes through which the water passed from the intake, through screens, subsidiary reservoirs, filters, pumps, service reservoirs, valves and mains, to the consumer.

The paper concluded with some remarks on waste-prevention, which could best be secured by the adoption of Deacon's meters. They were being largely used by the more advanced water companies, and resulted in a great saving, in many cases of as much as over 50 per cent.

In the discussion which followed, Messrs. R. W. Newman, Walter Hunter, F. L'Estrange, F. Fisher, B.Sc., W. Powrie, S. Boulding and others took part.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

22859. John Charles Pickard, for "Racket for window blind cord."
 22861. James George Crow and George James Cording, for "Improvements in hanging window-sashes."
 22885. Julius Heinrich Friedrich Kickkefel, for "Improvements in fire doors."
 22888. Joseph Wharfe, for "An improved locking device for use with sliding bolts for doors and the like."
 22898. George James Addison Richardson, for "Improvements in mortise locks for doors and the like."
 22925. Benjamin Skin, for "Improvements in or relating to fireproof and other walls and partitions."
 22963. Edwin Oliver Read, for "Protecting the joints of windows."
 23026. William Shelley, for "A new or improved window fastener."
 23051. Edward Hallam, for "Improvements in and relating to fire-grates, stoves, and the like."
 23107. William Elliott and Jannion Steele Elliott, for "Improvements in fire-grates or stoves."

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THE sub-committee of the cleansing and lighting department of the Edinburgh Town Council have ordered further experiments to be made with a view to increased lighting, especially in the districts not to be lighted by electricity.

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THE

Architect and Contract Reporter.

SPECIAL NOTICE TO THE TRADE
AND OTHERS.

[Extract from a lecture on Architects' Libraries by Professor T. Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

"Lastly, let me recommend the back volumes of the professional journals. In the course of years all sorts of architectural topics come up in the public press and before the professional societies, and if you hunt through the indexes of these publications when you are seeking for information which eludes you in books, you will often be rewarded."

There has been a considerable demand for the back numbers of *The Architect* during the last three or four months, which we have no doubt has arisen from the remarks made by Professor Roger Smith, as contained in the above quotation; but the consequence has been that our stock of back numbers is getting very low, and consequently, in future, the charge for back numbers of previous date to January 12, 1894, will be 6d. each.

A few of the back volumes may still be had, price 12s. each.

EDITORIAL NOTICES.

The authors of signed articles and papers read in public must necessarily be held responsible for their contents.

No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

Correspondents are requested as much as possible to make their communications brief. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

TENDERS, ETC.

*** As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the office, 175 Strand, London, W.C., not later than 5 P.M. on Thursdays.*

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CONTRACTS OPEN.

ALVERSTOKE.—Dec. 28.—For Building Boundary Walls, for the Local Board. Mr. E. T. Palmer, High Street, Gosport.

ASHTON-UNDER-LYNE.—Dec. 22.—For Building Houses and Shops. Mr. T. D. Lindley, Architect, 150A Stamford Street, Ashton-under-Lyne.

BALLYBAY.—Jan. 1.—Renovation of Church. Mr. Motherwell, Northern Bank, Ballybay, Ireland.

BANGOR.—Jan. 3.—For Reservoir. Mr. Francis Pollock, Town Clerk.

BELFAST.—Dec. 31.—For Building House. Messrs. Young & Mackenzie, Architects, Donegall Square East, Belfast.

BEVERLEY.—Dec. 22.—For Additions to Constable's House. Mr. Beaumont, County Surveyor, Beverley.

BRADFORD.—Dec. 21.—For Building Six Houses (Mason-work excepted). Messrs. Walker & Collinson, Architects, 227 Central Avenue, Swan Arcade, Bradford.

BROMLEY.—Dec. 26.—For Building Laboratory at Gasworks and Works at Town Hall, Baths, &c. Mr. F. S. Button, Borough Surveyor.

CARRICK-MA-CROSS.—Jan. 1.—For Additions to Donaghmoyn House. Mr. Logan, Architect, Dundalk.

CHORLTON-ON-MATLOCK.—For Boundary Wall, Railing Gates, &c. Mr. Talbot, Town Clerk, Manchester.

CWMSYFIOG.—Dec. 29.—For Building Board Schools. Messrs. James & Morgan, Architects, Charles Street Chambers, Cardiff.

DEWSBURY.—Dec. 29.—For Additions to Cemetery Lodge. The Borough Engineer.

DUDLEY.—Dec. 31.—For Building Board Schools, Eve Hill. Mr. R. F. Matthews, 35 Carlton Buildings, Paradise Street, Birmingham.

EDINBURGH.—Dec. 22.—For Underground Conveniences. The Burgh Engineer.

GREAT HARWOOD.—Dec. 29.—For Building Boundary Wall, Martholme. Messrs. Brierley & Holt, Engineers, Blackburn.

HARROGATE.—For Building Residences. Mr. E. J. Dodgshun, Architect, 2 Park Row, Leeds.

HAYWARD'S HEATH.—Dec. 28.—For Alterations to Mortuary. Mr. Henry Card, County Surveyor, Lewes.

HOUSLOW.—Dec. 22.—For Making-up and Sewering Roads. Mr. J. H. Strachan, Town Hall.

HUNTLY.—Dec. 22.—For Building Board School. Messrs. Matthews & Mackenzie, Architects, 267 Union Street, Aberdeen.

IRELAND.—Dec. 22.—For Additions and Alterations to Donaghmoyn House, Co. Monaghan. Mr. R. P. S. Logan, Architect, Dundalk.

LAND'S END.—Dec. 22.—For Additions to Hotel. Mr. John Trehwella, Jun., Architect, Sea View House, Sennen, Penzance.

LEEDS.—Jan. 12.—For Building Parcel and Superintendent's Offices. Mr. W. Bell, Architect, North-Eastern Railway, York.

LEYTON.—Dec. 24.—For Road Making, Curbed Paths, Surface Drains, Manholes, Gullies, &c. Messrs. Gustavus Thompson & Son, Devereux Chambers, Temple, W.C.

LLANDOVERY.—Jan. 3.—For Building School. Mr. J. H. Phillips, Architect, St. John's Chambers, Cardiff.

LLANELLY.—Dec. 24.—For Building Arcade. Mr. W. Griffiths, Architect, Falcon Chambers, Llanelly.

LONDON.—Dec. 24.—For the Construction of a Brick Gas-holder Tank. Mr. Saml. White, 60 Queen Victoria Street, E.C.

MANCHESTER.—Dec. 24.—For Glazing the Roofs of Lairages, Slaughterhouse houses, at Foreign Animals Depot. Mr. Wm. Henry Talbot, Town Hall, Manchester.

MANCHESTER.—Dec. 31.—For Erection of a Municipal Technical School. Mr. Wm. Windsor, 37 Brown Street, Manchester.

MARYBOROUGH.—Jan. 5.—For Additions, &c. to Lunatic Asylum. Mr. P. J. Tuohy, Secretary, Custom House, Dublin.

MENSTON.—Jan. 3.—For the Construction of 5,430 Yards of Brick and Earthenware Pipe Sewer, with Valves, Manholes, Lampholes. Mr. John Waugh, C.E., Sunbridge Chambers, Bradford.

SKIBBEREEN.—Jan. 12.—For Construction of a Reservoir, Filter Beds, River Diversion Pipes, Fountains, Hydrants, Valves, Pipe-laying and Erection of Caretaker's House. Mr. Richard W. Walsh, C.E., 10 South Frederick Street, Dublin.

ST. GEORGE'S, HANOVER SQUARE.—Jan. 12.—For Works and Materials for One Year. Mr. G. Livingstone, 1 Pimlico Road, S.W.

WALSALL.—Dec. 22.—For Alterations at Gasworks. Mr. J. R. Cooper, Town Clerk, Walsall.

WALTHAMSTOW.—Dec. 28.—For Making-up Streets and Laying Concrete Flags. Mr. G. W. Holmes, A.M.I.C.E., Town Hall.

WALWORTH.—Dec. 27.—For Sanitary Work at Newington Workhouse. Messrs. Jarvis & Son, 29 Trinity Square, S.E.

TENDERS.

BATH.

For Fittings of the Council Chamber in the New Municipal Buildings.

Ward & Lock, Lower Bristol Road	£721	0	0
Hayward & Wooster, Canwell Buildings	629	0	0
T. KNIGHT & SONS, Limited, 10 Milsom Street (accepted)	537	10	0

BISHOP AUCKLAND.

For Heating Part of the Workhouse, for the Guardians. Mr. C. JOHNSTON, C.E., Engineer, 1 Cradock Street, Bishop Auckland.

T. S. Brown, Newcastle	£86	12	6
Threlkeld & Wallace, Newcastle	62	0	0
H. G. Walker, Newcastle	51	0	0
Dinning & Cooke, Newcastle	48	10	0
R. T. Vaux, Sunderland	46	0	0
E. Thompson, Bishop Auckland	41	15	0
J. J. Spoor, Bishop Auckland	39	10	0
KILBURN & SYKES, Bishop Auckland (accepted)	38	15	0

CARDIFF.

For Supply of Cast-iron Pipes, for the Waterworks Committee.

Laidlaw & Sons	£2,426	13	6
Staveley Coal and Iron Company	2,152	5	0
Cochrane & Co.	2,151	15	0
Jordan & Sons	2,129	16	8
Stanton Ironworks Company	2,121	0	6
T. Spittle	2,068	9	0
G. & S. ROBERTS (accepted)	2,059	11	3

BRACKNELL.

For Sewerage Works, for the Easthamstead Rural Sanitary Authority. Mr. W. H. RADFORD, Engineer, Angel Row Nottingham.

R. E. Facey, Taunton	£9,490	0	0
J. Neave, Lordship Lane	8,386	0	0
J. Jackson, Plaistow	8,359	0	0
S. Hipwell, Wisbech	8,086	0	0
B. Cooke & Co., Battersea	8,037	0	0
G. G. Raynor, Romford	7,775	0	0
J. H. Vickers, Nottingham	7,539	8	9
G. Brown, Bracknell	7,500	0	0
H. Hill, Maidenhead	7,459	6	7
J. S. Kitteringham, Enfield	7,457	0	0
Wilkinson Bros., Finsbury Park	7,200	0	0
W. Jenkins & Sons, Leamington Spa	7,126	0	0
E. C. Hughes, Wokingham	7,020	14	0
Collier & Catley, Reading	6,919	0	0
McCarthy E. Fitt, Reading	6,737	0	0
J. Band, Grays	6,660	0	0
R. HOLMES & Co., Chesterfield (accepted)	6,585	0	0

COCKERMOUTH.

For Laying Water-pipes at Crossbarrow, for the Cockermouth Union Rural Sanitary Authority. Mr. J. B. WILSON, Engineer, Court House Buildings, Cockermouth.

Huntrods & Co., Workington	£57	18	4
J. Walker, Cockermouth	52	0	0
Fisher & Co., Cockermouth	43	10	0
Wilson & Robinson, Brigham	43	10	0
D. Bell, Cockermouth	41	5	0
W. M. OWEN, Workington (accepted)	38	0	0

DONCASTER.

For Erection of School, Carr Lane, for 712 Scholars, for the Corporation of Doncaster. Mr. W. H. R. CRABTREE, Borough Surveyor, 3 Priory Place, Doncaster. Quantities by the Borough Surveyor.

Contract No. 1.—Buildings.

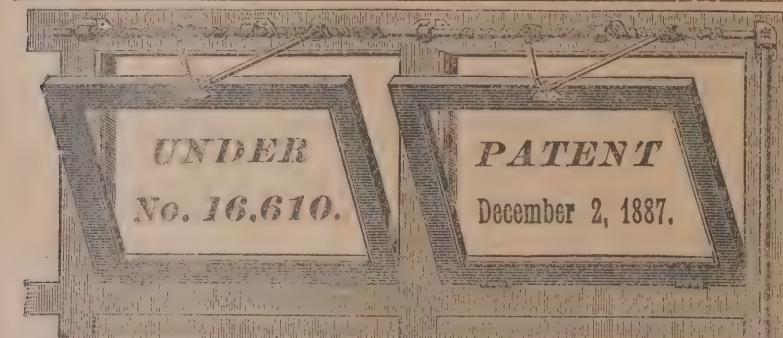
Mullins & Richardson, Doncaster	£4,120	15	5
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Contract No. 2.—Heating.

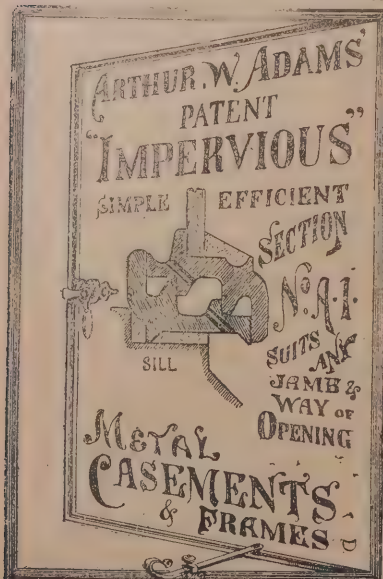
Farr & Sons, Doncaster	203	10	0
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Contract No. 3.—Dual Desk Furniture, &c.

Bennett Furnishing Company, Glasgow	309	14	0
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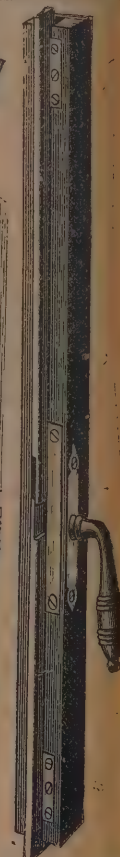
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For Works, Valletort Place, High Street, for the East Stonehouse Local Board. Mr. W. STRINGFELLOW, Surveyor.

J. Shaddock, Plymouth	£431	11	0
C. L. Duke, Plymouth	340	0	0
Ambrose & Welch, Bath	335	0	0
J. Parsons, Plymouth	280	0	0
A. N. COLES, East Stonehouse (accepted)	245	0	0

ELHAM.

For New Main and Rain-water Drainage and Tanks for the Workhouse, and for Pumps and Pump Houses, Enclosure Walls and Gates to the recently-added Land, for the Guardians of Elham Union. Messrs. JOSEPH GARDNER & JOHN LADDS, Architects, 2 Carlton Place, Folkestone.

W. Piper, Hastings	£2,464	2	5
Fearon, Folkestone	2,450	0	0
Hayward & Paramor, Folkestone	2,216	0	0
WALLIS & SONS, Maidstone (accepted)	2,137	0	0

ELING.

For Building an Infants' Board School. OSMAN, Southampton (accepted)

	£2,050	0	0
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FISHPONDS.

For Building School at Causeway, Fishponds, for the Stapleton School Board. Mr. W. V. GOUGH, Architect, 24 Bridge Street, Bristol.

Hatherly & Carr, Bristol	£3,765	0	0
Eastbrook & Son, Bristol	3,621	0	0
S. Williams, Bristol	3,569	5	8
H. A. Forse, Bristol	3,566	11	6
A. J. Bevan, Bedminster	3,510	0	0
E. Clark, Fishponds	3,456	0	0
Bale & Westlake, Clifton Down	3,414	13	5
Cowlin & Son, St. Paul's	3,397	0	0
Humphreys & Son, Bristol	3,389	18	6
J. E. Davis, Bristol	3,368	0	0
E. Walters, Clifton	3,329	0	0
J. Browning, Fishponds	3,293	15	0
E. Field & Son, Bath	3,247	19	11
E. Love, Clifton	3,221	10	0
R. Wilkins & Co., Bristol	3,180	6	0
L. Wilkins & Gosling, Bristol	3,140	19	11
C. A. Hayes, Bristol	3,148	0	0
H. J. Rossiter, Bedminster	3,135	10	0
G. H. WILKINS, Bristol (accepted)	3,121	10	0

FILTON.

For Laying Water Mains and other Work connected, for the Barton Regis Rural Sanitary Authority. Mr. A. P. I. COTTERELL, Engineer, Lonsdale Chambers, 7 Baldwin Street, Bristol.

Lloyd & Powell, Bristol	£1,191	13	4
Love & Waite, Bristol	665	0	0
W. Merewather, Bristol	585	0	0
Grainger, Bristol	550	0	0
W. G. Thatcher, St. George	524	0	0
W. H. Smith, Clifton	490	10	0
Durnford & Son, Bristol	449	6	8
S. AMBROSE, Bath (accepted)	398	0	0
Hughes, Sutton & Digby, London	391	0	0

GLASGOW.

For Galleries and Recreation Rooms on the Green.

Accepted Tenders.

Morrison & Muir, mason, brick and iron works	£8,668	11	11
Anderson & Henderson, Limited, wright and glazier works	2,187	0	8
G. Rome & Co., plasterer	797	10	0
J. Paterson & Co., plumber	339	0	0
J. Youden & Co., tilework	210	9	0
Hamilton & Co., slater	86	18	6

ILFRACOMBE.

For Additions to Manor Hotel, Lee, Ilfracombe. Mr. W. C. OLIVER, Architect, Bridge End, Barnstaple. T. UPTON, Cross Park House (accepted).

	£1,435	0	0
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LEEDS.

For Caretaker's House at Victoria Cattle Market, for the Leeds Corporation.

JACKSON & MONCKMAN (accepted)	£271	0	0
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LIVERPOOL.

For Increased Accommodation for Nurses at Parkhill Fever Hospital, and also Increased Kitchen Accommodation, for the City Council.

MORRISON & SONS, Wavertree (accepted)	£1,975	0	0
MORRISON & SONS, Wavertree (accepted)	1,190	0	0

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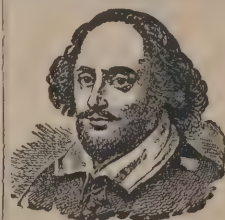
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For Roadmaking and Paving Works, for the Vestry of Fulham.
Mr. CHARLES BOTTERILL, Surveyor.

Elmsstone Road—Roadway.

Robertson & Grant, Clapham	£372	0	0
T. Adams, Wood Green	248	0	0
H. J. Greenham, Hammersmith	233	0	0
S. Hudson, Streatham	218	0	0
E. Parry, Fulham	215	0	0
G. Wimpey, Hammersmith	215	0	0
Nowell & Robson, Kensington	187	0	0
J. Ball, Chiswick	190	0	0

York.

Robertson & Grant	175	0	0
T. Adams	165	0	0
Nowell & Robson	165	0	0
G. Wimpey	162	0	0

Adamant.

T. Adams	123	0	0
G. Wimpey	117	0	0

Victoria.

S. Hudson	135	0	0
T. Adams	132	0	0
Victoria Stone Co., Kingsland	130	0	0

Imperial.

S. Hudson	130	0	0
T. Adams	125	0	0
Imperial Stone Co., Greenwich	123	0	0

Shop Silicated.

S. Hudson	126	0	0
T. Adams	123	0	0

Enderby and Stoney Stanton.

T. Adams	123	0	0
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Stuart's.

T. Adams	123	0	0
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Claxton Grove—Section I.—Roadway.

Robertson & Grant	485	0	0
T. Adams	473	0	0
J. Ball	392	0	0
E. Parry	370	0	0
Nowell & Robson	355	0	0
G. Wimpey	349	0	0
H. J. Greenham	330	0	0

LONDON—continued.

York.

Robertson & Grant	£294	0	0
Nowell & Robson	267	0	0
T. Adams	256	0	0
G. Wimpey	254	0	0

Adamant.

T. Adams	191	0	0
G. Wimpey	184	0	0

Victoria.

T. Adams	205	0	0
Victoria Stone Co.	202	0	0

Imperial.

Imperial Stone Co.	194	0	0
T. Adams	194	0	0

Shop Silicated.

T. Adams	191	0	0
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Enderby and Stoney Stanton.

T. Adams	191	0	0
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Stuart's.

T. Adams	191	0	0
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Peterborough Mews—Setts.

H. J. Greenham	150	0	0
Robertson & Grant	138	0	0
Nowell & Robson	136	0	0
E. Parry	133	0	0
T. Adams	124	0	0
G. Wimpey	118	0	0
S. Hudson	110	0	0

Tar Macadam.

H. J. Greenham	155	0	0
Nowell & Robson	116	0	0
T. Adams	109	0	0
G. Wimpey	105	0	0

For Pulling-down and Rebuilding 314 Bethnal Green Road,
for Mr. J. Sigournay. Mr. G. E. HOLMAN, F.S.I., Archi-
tect. Quantities by Mr. A. J. TURNER.

Killby & Gayford	£1,520	0	0
Thomason & Son	1,424	0	0
T. H. Craig, Bow	1,399	0	0
S. W. Hawkins	1,339	0	0
T. WHITE & SON, Bow (accepted)	1,295	10	0
Surveyor's estimate	1,320	0	0

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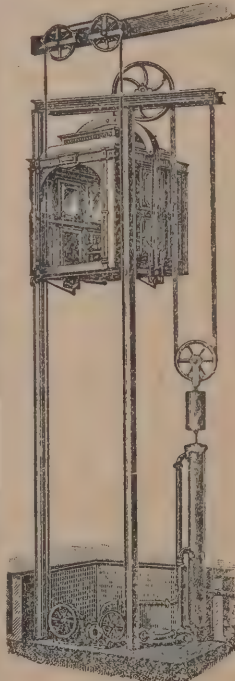
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D. Charteris	40,742 0 0	—
Patman & Fotheringham	39,499 0 0	—
W. Calnan & Co.	38,940 0 0	40 0 0
Perry & Co.	38,623 0 0	217 0 0
J. Mowlem & Co.	38,280 0 0	—
H. L. Holloway	38,400 0 0	400 0 0
J. Shillitoe & Son	38,300 0 0	350 0 0
Higgs & Hill	37,776 0 0	64 0 0
B. E. Nightingale	37,876 0 0	300 0 0
Kirk & Randall	35,320 0 0	500 0 0

For Structural Alterations, New Drainage and Decorations, at 30 Tollington Park, N., for Mrs. G. H. Cole. Mr. G. GORDON STANHAM, Architect, 100B Queen Victoria Street, E.C.

J. APPELBY (accepted) £716 0 0

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Potter & Son	£315 0 0
Sugg & Co.	284 0 0
Tabour & Hinchcliffe	240 5 0
Greene & Son	239 5 0
Bayliss & Son	239 0 0
Reynolds & Co.	225 0 0
Jones	224 5 0
Creek & Powell	214 0 0
Vaughan & Brown	210 0 0
Mitchell & Son	205 0 0
Christie & Co.	196 15 0
Hulett & Co.	178 10 0
Defries & Son	174 0 0
Finegan & Co.	173 0 0
J. & W. Jeal	167 0 0
SIMMONS (accepted)	164 0 0

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Manor Road.

Potter & Son	£527 0 0
Tabour & Hinchcliffe	320 19 0
Sugg & Co.	316 15 0
Bayliss & Son	310 17 6
Mitchell & Son	272 12 6
Greene & Son	262 0 0
Vaughan & Brown	256 0 0
Reynolds & Co.	249 16 8
Hulett & Co.	244 0 0
Creek & Powell	233 0 0
Defries & Son	225 0 0
Christie & Co.	224 16 6
Jones	216 15 0
Finegan & Co.	209 7 6
Simmons	206 10 0
J. & W. JEAL (accepted)	187 15 0

Three Mills.

Potter & Son	394 0 0
Bayliss & Son	296 7 6
Tabour & Hinchcliffe	290 19 0
Sugg & Co.	290 12 0
Greene & Son	237 5 0
Reynolds & Co.	230 0 0
Mitchell & Son	223 10 0
Vaughan & Brown	215 0 0
Creek & Powell	204 0 0
Hulett & Co.	204 0 0
Christie & Co.	202 7 6
Finegan & Co.	189 12 0
Simmons	186 0 0
Defries & Son	184 0 0
Jones	172 0 0
J. & W. JEAL (accepted)	158 5 0

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Coulsell Bros., Bethnal Green	673 0 0
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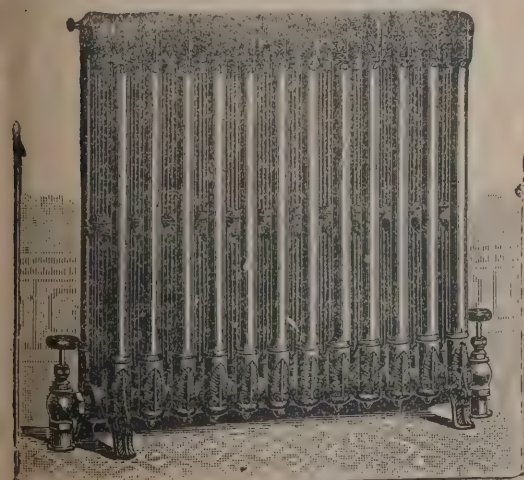
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LONDON—continued.

For Wrought-iron Fencing and Gates, Bishop Park, Fulham, for the Fulham Vestry. Mr. C. BOTTERILL, Surveyor.	
Rownson, Drew & Co., Upper Thames Street	£187 0 0
Bone Bros., Fulham	173 5 6
Jones & Co., Goswell Road.	167 15 0
Falkirk Iron Co., Upper Thames Street	158 2 0
Bayliss, Jones & Bayliss, Cannon Street	153 4 2
D. Rowell & Co., Old Queen Street	135 3 6
Hill & Smith, Brierley Ironworks	125 14 3
J. Bird & Co., Regent Street	117 14 3
Gibb & Co., Fenchurch Street	116 11 8
Pearson, Notting Hill Gate	113 14 3
Palmer, Victoria Street	113 13 2
MAIN & Co., Queen Victoria Street (accepted)	111 13 6
For Construction of Underground Convenience, Busmen's Shelter and Waiting-room, &c., at the Junction of Brixton Road and Coldharbour Lane, for the Lambeth Vestry. Mr. J. P. NORRINGTON, Surveyor.	
Doulton & Co.	£2,784 0 0
G. Jennings	2,745 0 0
B. FINCH & Co (accepted)	2,548 0 0
For Providing and Fixing a System of Low pressure Hot-water Apparatus for Warming Junior Mixed School in the Canterbury Road, Old Kent Road, to Provide Accommodation for 352 Children.	
W. G. Cannon & Sons	£269 10 0
G. Davis	258 0 0
T. Green & Son, Limited	250 0 0
Comyn Ching & Co.	247 10 0
J. Wontner-Smith, Gray & Co.	233 16 0
J. Gray	221 0 0
T. Potter & Sons, Limited	217 0 0
J. F. Clarke & Sons	182 0 0
H. Parsons & Harris	170 10 0
J. C. & J. S. Ellis, Limited	157 10 0
For Providing and Fixing Hot-water Coils and Stoves in Conjunction with a Tubular Boiler to be Placed at the Back of Fireplace, at School in Marner Street, Bromley.	
Comyn Ching & Co.	£63 10 0
Wilson Engineering Company, Limited	58 9 0
Purcell & Nobbs	57 10 0
J. Wontner-Smith, Gray & Co.	51 10 0
W. G. Cannon & Sons	45 10 0
Vaughan & Brown	37 15 0

MAKER.

For the Reconstruction of Urinal, Kingsand, Maker, for the St. German's Rural Sanitary Authority.	
Hands'ord, Millbrook	£70 0 0
Harris, Torpoint	64 0 0
W. STEPHENS, Millbrook (accepted)	53 17 0

NEATH.

For Construction of Underground Service Tank of 24,500 Gallons Capacity, Laying of 4,705 Yards of 3-inch Cast-iron Water-main, with Pillar Taps and all Necessary Valves and Fittings, at Cilfiri, Blaenhonddan, for the Neath Rural Sanitary Authority. Mr. W. E. CLASON THOMAS, Engineer, Post Office Chambers, Neath.	
D. Jenkins, Swansea	£1,880 0 0
D. Rees, Neath	1,700 0 0
J. Jones, Llwynbedw	1,545 0 0
G. R. Harris, Neath	1,515 3 9
Thomas, Watkins & Co., Swansea	1,390 12 1
Gardner & Happerfield, Penarth	1,195 5 4
Barnes, Chaplin & Co., Cardiff	1,191 0 4
D. Evans & Sons, Penygraig	1,169 9 11
W. Jones, Neath	1,150 2 0
T. S. GREGORY & Co., Cardiff (accepted)	1,028 19 11

NEWBURY.

For Dwelling-house on Site of the Newbury Outfall Works, for the Corporation. Mr. E. A. STICKLAND, Borough Surveyor.	
T. Taylor, Newbury	£269 10 0
E. C. JAMES, Newbury (accepted)	269 0 0
Borough Surveyor's estimate	260 0 0

QUEENSBURY.

For Building Offices, Surveyor's House, Stabling, Mortuary, Fire Brigade Station, Boundary Walling, &c., Albert Road, Queensbury. Mr. JOHN DRAKE, Winterbank, Queensbury, Bradford.	
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Accepted Tenders.

E. Balmforth, mason	£1,022 0 0
S. Benn, joiner	264 2 0
S. Wright, plumber	177 0 0
Hill & Nelson, slater	92 0 0
W. H. Sutcliffe, plasterer	68 7 0
S. Wright, heating apparatus	36 10 0
S. Gregson, painter	16 8 0

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READING.

For Additions, &c., to Grovelands School, Oxford Road, for the School Board. Mr. S. SLINGSBY STALLWOOD, Architect, Market Place, Reading.

W. Yaxley, Mundesley Street	£593	0	0
G. Wernham, Princes Street	586	0	0
G. Dixon, Alfred Street	540	0	0
H. Higgs & Sons, Queen's Road	530	0	0
T. Pilgrim, Garnet Street	527	0	0
W. Hawkins, Junction Road	519	0	0
G. S. Lewis, Castle Street	502	0	0
G. H. Tucker, Caversham Road	496	0	0
S. East, Zinzan Street	490	0	0
McC. E. Fitt, London Road *	477	0	0

* Accepted, subject to the approval of the Education Department.

SELLY OAK.

For Building Infirmary on Land Adjacent to Workhouse at Selly Oak, for the Guardians of King's Norton Union. Mr. DANIEL ARKELI, Architect, Temple Row West, Birmingham.

W. & J. Webb, Birmingham	£21,479	0	0
R. Fenwick, Birmingham	20,499	0	0
H. Wilcock & Co., Wolverhampton	20,406	0	0
G. Squires, Birmingham	20,336	0	0
Barnsley & Son, Birmingham	19,888	0	0
W. Bishop, King's Heath, Birmingham	19,867	0	0
Trentham, Handsworth	19,683	10	0
W. Robinson, Birmingham	19,581	0	0
T. Johnson, Birmingham	19,560	0	0
J. Bowen, Birmingham	19,376	0	0
Moffat & Sons, Birmingham	18,995	0	0
J. Harley & Sons, Smethwick	18,970	0	0
B. Whitehouse, Birmingham	18,963	0	0
W. Sapcote & Sons, Birmingham	18,950	0	0
R. M. Hughes, Birmingham	18,821	0	0
H. Vickers, Nottingham	18,450	0	0
T. ROWBOTHAM, Birmingham (accepted)	17,987	0	0
Lane Bros., Birmingham	17,735	0	0
J. Malin, West Bromwich	—		

WARRINGTON.

For Construction of About 220 Lineal Yards of 15-inch Pipe Sewer, for the Paving and Sewerage Committee. Mr. THOS. LONGDIN, Borough Surveyor.

W. HEATON (accepted)	£765	0	0
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TENBURY.

For the Erection of Post Office Building, Teme Street, Tenbury. Mr. W. W. ROBINSON, Architect, 10 King Street, Hereford.

Small Bros., Droitwich	£840	0	0
Williams, Knighton	825	0	0
HOWELLS, Tenbury (accepted)	820	0	0

WHITBY.

For Building Two Lifeboat Houses Adjoining the Harbour-master's House, for the Royal National Lifeboat Institution. Mr. W. T. DOUGLASS, Architect, 17 Victoria Street, Westminster.

J. White	£1,233	9	4
I. Stephenson	925	16	0
LANGDALE & SONS (accepted)	913	0	0

WHITGREAVE.

For Building a School at Whitgreave.

P. Birchall, Tunstall	£261	0	0
J. Jervis, Stafford	209	10	0
W. Whitfield, Stone	193	0	0
F. ESLEY, Stafford (accepted)	185	10	0
G. Dylner, Tillington, Stafford	179	0	0

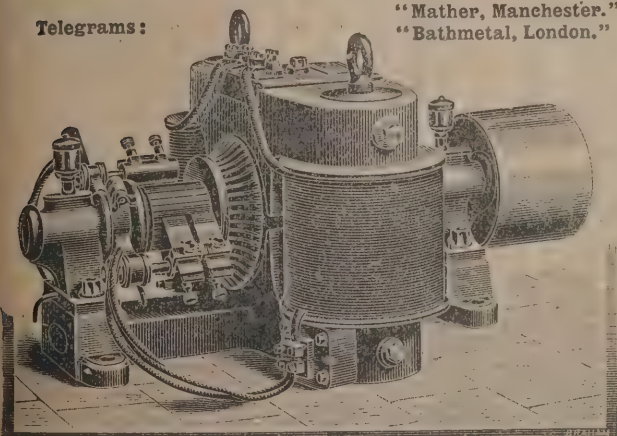
WOOLWICH.

For Addition to Vagrants' Wards at Union House, Plumstead, for the Guardians of Woolwich Union. Mr. J. O. COOK, Architect, 1 Eleanor Road, Woolwich.

Chinchen, Kensal Green	£1,160	0	0
Hodgin, Plumstead	1,117	0	0
W. Martin, Greenwich	1,098	0	0
E. Proctor, Woolwich	1,092	0	0
T. White & Son, Bow	1,080	0	0
Williams & Sons, Clapham Junction	1,050	0	0
Multon & Wallis, Gravesend	1,049	0	0
W. Neil, Bow	1,037	0	0
J. Ottway, Chislehurst	1,035	0	0
C. Kitley, Plumstead	994	0	0
G. Monday & Sons, Tower Hill	993	0	0
W. Collinson, Teddington	984	0	0
W. Pavey, Winchmore Hill	955	0	0
T. J. BARDEN, Maidstone (accepted)	940	0	0

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Also, Testimonials from Dr. Hassall, September 23, 1863; the late Dr. Letheby, February 15, 1866, and December 1872.

Price, £1 10s. and upwards. Portable Filters on this System, £1 5s. to £3.

Patronised and used by Her Majesty the Queen at Osborne, by H.R.H. the Prince of Wales at Sandringham, by H.R.H. the Duke of Edinburgh at Eastwell, by H.R.H. the Duke of Connaught at Baginbode Park, by H.R.H. the Duke of Cambridge, the *élite* of the Medical Profession and at the London, Middlesex, St. George's, St. Mary's Consumption, Fever, and German Hospitals, and various Lunatic Asylums, Institutions, Breweries, &c., and at all the Schools established by the School Board for London. Pocket Filters, 4s. 6d. and 6s. each. Household and Fancy Filters, from 10s.

Water-testing Apparatus for detecting Impurities in Water, 10s. 6d. and 12s. each.

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NO. 1 HOLLAND PARK, W. RESIDENCE OF MR. VAL PRINSEP, R.A.

TRADE NOTES.

THE new Board schools, Bulwell, Nottingham, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

THE Kirkcaldy municipal authorities have decided to erect a new three-dialed illuminated clock on the tower of Pathhead Hall, the cost of which, with the necessary alterations, is estimated at 150*l*.

THE Easthampstead Rural Sanitary Authority have accepted the tender of Messrs. R. Holmes & Co., of Chesterfield, amounting to 6,535*l*., for the sewerage works at Bracknell. The works include two small pumping stations and storage tanks. The engineer to the scheme is Mr. W. H. Radford, C.E., of Nottingham, whose estimate for this part of the work was 7,000*l*.

A NEW illuminated turret clock has been made and erected in Hayfield parish church by Messrs. W. Potts & Sons, of Leeds & Newcastle, the donor being Mr. J. Dack, J.P., Hayfield.

WE have received from the London and Lancashire Fire Insurance Company, 45 Dale Street, Liverpool, a handy wall calendar for 1895. On the back of the card is given information so often needed for reference at a moment's notice as to postal arrangements, stamps for agreements, &c., income and property tax, &c. On the back of the removable sheets will be found memoranda forms for each month. The face of each sheet shows the day of the week and month at a glance, and they are carefully printed in two colours, blended, each sheet differing in tints. The changes of the moon are given, with other information as to holidays, feasts, &c.

WE give a list of tenders for the construction of an underground convenience, &c., for the Lambeth Vestry. The work

will be carried out at the expense of the Vestry, under the superintendence of their surveyor, Mr. James P. Norrington. The busmen's shelter and waiting-room were designed by Mr. R. Cruwys, architect, Brixton, acting for the freeholder.

LAST week we published a list of tenders for the rebuilding of the Jamaica Bridge, Glasgow. The bridge committee of the Town Council have selected the tender of Messrs. Morrison & Mason, the estimate being 81,176*l* 5*s*.

AN artistic collection of designs for casement fittings has been put together in a very elegant form by Mr. Henry Hope, of Lionel Street, Birmingham. A sheet has been, in each case, devoted to the separate illustrations. In the introduction Mr. Hope says:—To meet the demand for casement fittings, artistically designed and executed in the best possible style, I have produced the casement latches which are illustrated in this book. All the photographs are taken from the casements themselves, and the general finish on all orders for this class of work is guaranteed equal to these. The designs are mostly adapted from existing examples, and a great variety of these can be supplied without extra cost. These illustrations are given as specimens of workmanship and design, and I shall always be pleased to work out architects' sketches, and give full-size drawings for approval, before putting the work in hand. The specimens illustrated give a good idea of the excellence of the work produced by Mr. Hope, both as to design and finish.

BUILDING AND BUILDERS.

AT Tipton arrangements have been completed for the erection of a new post-office for the Horseley Heath portion of the parish. The site has been purchased by the postal authorities from Mr. W. W. Doughty. The building will be of red Ruabon brick and terra-cotta, with a frontage to Horseley Heath and Horseley Road of about 100 feet.

THE death is announced of Mr. Alderman Harris, of Okehampton, aged only thirty-five years, who carried on an extensive business as a builder and contractor. Mr. Harris was one of the charity trustees and an overseer for the borough. He leaves a widow, but no family.

MR. J. T. SMITH, of Whitcomb Street, has prepared plans for the rebuilding and extension of the King's Head Hotel, Harrow. The works and furnishing will cost about 16,000*l*.

THE INCANDESCENT GAS LIGHT

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One "C" Burner gives a Light of from 60 to 70 Candles, with a Consumption of $3\frac{1}{2}$ Cubic Feet of Gas per Hour.

TREBLE THE LIGHT OF AN ORDINARY GAS BURNER WITH HALF THE CONSUMPTION OF GAS.

NO SMOKE, SMELL, OR DIRT.

CAN BE ATTACHED TO ORDINARY GAS FITTINGS.

Two Independent Scientific Opinions:—

The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (*i.e.* the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

ORDINARY BURNERS, 50 calories per candle per hour.					COAL GAS.				
ARGAND	"	44	"	"	"	"	"	"	"
					SIEMENS' BURNERS, 23 calories per candle per hour.				
					WELSBACH				

Superior to Electric Light and one-eighth the Cost. Special quotations for large installations.

FOR FURTHER PARTICULARS, APPLY TO

THE INCANDESCENT GAS LIGHT CO., LIM.,
14 Palmer Street, Westminster, London.

At a cost of about 250,000*l.* the Manchester Corporation have decided to carry out a somewhat novel scheme in the way of providing artisan dwellings. An overcrowded and unhealthy area in the centre of the city, containing about five acres, is to be cleared and blocks of workmen's dwellings erected thereon. Extensive spaces will be left for playgrounds, while the roofs of the buildings—in the construction of which novel features will be introduced—will be made flat and adapted as recreation and playgrounds, as well as drying-grounds. The open spaces will also be planted with trees and flower-beds arranged. Mr. John A. Langston, architect, Took's Court, Chancery Lane, the author of the scheme, writes that 250,000*l.* is required for buying the freehold, diverting the river Medlock and building the dwellings, independent of clearing the area.

The memorial-stones have been laid of new sewage works and a marine lake which are being constructed at Rhyll at a cost of 50,000*l.* The engineer is Mr. Baldwin Latham, and it has been decided to give the contract to Mr. Law, of Kidderminster.

ELECTRICAL.

The annual meeting of the Institution of Electrical Engineers was held in the hall of the Institute of Civil Engineers, Mr. Alexander Siemens in the chair, when Mr. R. E. Crompton was elected president. The report gave an excellent account of progress in finances, the number of members being over 2,300, and considerable sums had been transferred to permanent investments.

The deputation of the Glasgow Town Council who visited Budapest to inspect the electric tramways give 12,650*l.* as the average total cost of construction per mile of single line, the running expenses being stated as exceedingly low.

At the meeting of the Manchester Association of Students of the Institution of Civil Engineers Mr. C. H. Wordingham, A.M.Inst.C.E., read a paper describing the Manchester electric-lighting works. Mr. A. Ross, president of the Association, occupied the chair. The author first referred to the interest excited among engineers by the Manchester electric supply on account of its magnitude and importance, and more especially

because of the five-wire system decided upon by the engineer. It was interesting to note that the St. Pancras Vestry were on the point of converting their three-wire into a five-wire system. Mr. Wordingham said considerable extensions were contemplated for next winter, and there was every indication that this would be the largest municipal station in the kingdom.

The illumination of Electric Avenue, Brixton, began on Tuesday evening, the 18th inst., to December 24, inclusive, on a much more extended scale than any of the previous Christmas illuminations produced there. The street is about 600 feet long by 44 feet wide. The avenue will form one vast stage, where at stated times in the evening the most beautiful prismatic effects will be created by the constant changes of the coloured lights, thereby producing results both startling and beautiful, and giving the public additional proof of the unique possibilities of electricity.

VARIETIES.

The Dewsbury and Heckmondwike Water Board have approved the draft of a Parliamentary bill proposing to borrow 190,000*l.*

The *Leeds Mercury* says:—Of the two sites suggested by the Hull Corporation for the proposed municipal buildings, the Paragon Street to Prospect Street site will provide the town with a public square in Prospect Street about 900 feet long by 150 wide. This square would be larger than Trafalgar Square, London; St. George's Square, Liverpool; or George Square, Glasgow, and by arrangement with the infirmity authorities, 30,000*l.* worth of open land in front of the infirmity would practically be given to the town free.

The State apartments and the Albert Chapel at Windsor will be open to the public on Monday, December 24, and on Boxing Day. The hours of admission will be from eleven till three o'clock.

At Southport a partial collapse has taken place on the pier, near the Pavilion, owing to several supporting pillars being swept away. The recent high tides overflowed the new carriage-drive made by the Corporation, and a rush of water, receding through the overflow pipes, had cut a channel in the

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sands from 6 to 18 feet deep, with the result that the pillars of the pier were undermined and gave way. Communication with the extreme end of the pier, which now resembles a switchback railway, is entirely cut off, and the damage is estimated at several hundred pounds.

EFFORTS are being made to raise 25,000*l.* to carry out needed improvements on the Sussex County Hospital.

NEW CATALOGUES.

MESSRS. BAIRD, THOMPSON & Co., Limited, of Charlton Engineering Works, Islington, are issuing their new catalogue, 1895, of ventilating, warming, drying and other specialties in which they are specialists. Their new edition contains a very large number of new and artistic designs suitable for all classes and styles of architecture, and cannot fail to commend itself and prove of great value to the profession. From the continued success of their specialties and the facility afforded at their new works, this company are now enabled to turn out their appliances more expeditiously and at a great saving of cost, in consequence of which an important reduction has been made in their prices. The whole catalogue is a work of art and reflects great credit on this enterprising company. The following are some specialties:—Ventilators, automatic and mechanical; extractors and inlets, electric ventilators for all purposes, air propellers, belt driven or with high speed engine; water motor, compressed air motor, also by electricity; compressed air system of ventilation, warming and drying, also cooling; waterspray system of ventilating and cooling, smoke flue ventilators, artistic improved chimney cowl (slightly and effective), improved systems of heating by steam, hot-water and hot-air, Plenum system of combined ventilating and warming for all classes of buildings, new and improved drain-testing apparatus, new and improved dry or earth closets, &c.

REFUSE DESTRUCTION.

LAST week we referred to the "Incinerator" (Dr. Sergeant's patent), manufactured by Messrs. Manlove, Alliott & Co., Limited, Engineers, Nottingham. This invention is meant to deal with all kinds of refuse produced at hospitals, asylums, prisons, workhouses and public institutions. The "Incinerator" is a furnace specially adapted for the destruction or purification by fire of either fluid or solid refuse. The destruction of refuse

by fire is acknowledged by the most eminent sanitary authorities to be the only safe method of dealing with such objectionable matter. Refuse has been known to produce disease when allowed to remain on the premises, and when removed to a distance the public health has suffered elsewhere. Much expense is saved in the cost of cartage in towns where Fryer's destructors are in operation, and in some cases the heat generated by the burning refuse is so employed as to become a source of revenue. For smaller requirements the "Incinerator" has been devised, and in it the most dangerous class of refuse, pervaded with the most infectious matter from hospitals, &c., is got rid of by the most perfect and economical method, complete combustion of vapours being insured and no foetid smells allowed to escape. It is suited for small and for large institutions, and can be erected at a small expense and requires little attention.

THE CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the opening meeting of the session of this Society the president, Mr. C. T. Walrond, read his address, and took for the subject of it the latest development of various branches of sanitation. Mr. Walrond began by drawing attention to the fact that the increased attention now being bestowed upon sanitation was largely due to the rapid growth of towns. He then referred to the improvements in the chemical treatment of sewage which are taking place. Next some recent forms of precipitation tanks were described, the "Candy" tank being specially alluded to, and its advantages for the ready removal of sludge without the necessity of drawing off the sewage or interrupting its flow were specially pointed out. The Webster process for the purification of sewage by direct electrolysis, the Hermite system of treating town sewage, not in bulk, but in detail, by a supply of electrolysed sea water laid on to every town for disinfecting purposes, were described. To the latter system he saw serious objections. The Scott-Moncrieff system of bacteriological purification, which opens up prospects of a revolution in present methods of sewage-disposal in the near future, was then considered.

Mr. Walrond passed on to the subject of the use of distributors in getting rid of town refuse; then to recent methods of preventing the filtration of water into or out of sewers; to the increased use of the transmission of power from central stations for automatically raising sewage; and to

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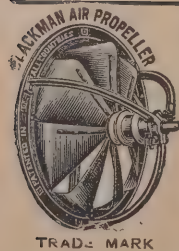
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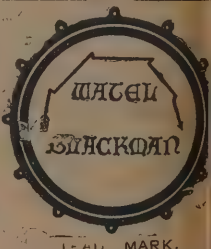
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the problem of sewer ventilation, the key to which appeared to be, in his opinion, the diminishing of the number of ventilating openings, regulating their size, and using artificial means for extracting foul air from the sewers, for which latter purpose the exhaust air from "Shone Ejectors" could be usefully employed.

Coming to the question of house drainage, the speaker recommended that soil-pipes, as well as drains, should be subjected to tests by the surveyors to local authorities, and urged the desirability of an authoritative set of standard tests and conditions, compliance with which would entitle a house to be registered according to its sanitary state, the register to be open to the public on payment of a small fee.

The address was discussed, and a vote of thanks to the President closed the meeting.

FIRE PROTECTION.*

(Concluded from last week.)

I SUPPOSE I need really not specially mention that physical strength and a perfect constitution are requisite for both officers and men. As to the height of the men, I can only say that I have found small, wiry men to come in very handy. First-class eyes, ears and nose are necessary, also a good memory. There is one point I must here not omit, and that is, that many brigades only take single men; non-coms. and officers are only allowed to marry. As to age, there are many brigades where twenty-two and forty are the limits for the privates, fifty for the non-coms. and sixty for the officers.

As to the equipment, there are brigades which have all their sections or units provided with practically the same gear; others where each unit has a double or treble set, one of which is used according to circumstances. The section may have a manual engine, a steamer and a ladder truck at its disposal, and may turn out with either. Then there are towns where the units are differently equipped, and we find steamer or manual sections, called out as the case may be. In a few extreme cases where the sections are very strong, they may be equipped with a set of engines and trucks, and the unit in every case turns out complete with, say, a manual, a steamer and a horsed escape. The contrast to this will be found in the small parties of twos

or threes I referred to, whose turn out would only consist of a small horse trolley or an escape. Of course there are all kinds of combinations. I have known sections to have one or more independent sub-sections. Though practically belonging to the "unit," the sub-sections would work independently in charge of a certain gear, say a hose car, a long ladder, a fire suit, or a smoke helmet, according to circumstances. The sub-sections may also act as outposts—if I may call them so—as a station guard, or simply as specialist parties, which are only called out for particular work.

As for the housing of the units or sections, there are the simple street stations for the small parties referred to. In a few cases I have known two small parties to be under the same roof. The large bodies that back them are generally quartered together in extensive barracks, from which any number of engines and men can be turned out according to the nature of the call. Then there are cities where every section has its own well-built station; others where one or two sections are housed together, according to circumstances, and perhaps as many as half a dozen located at headquarters. If groups are formed, the headquarters of the group or district perhaps has two sections, while each of the other stations only have one. The general headquarters may be the central station of a district at the same time. The actual working of the district headquarters would, however, then be kept separate from the working of the headquarters staff. The latter would, perhaps, have some sections ready to send anywhere, besides the trucks—necessary for the officers—any general extra gear, &c., that might be required. It is usual to combine workshops, stores, hose drying towers, &c., with the headquarters station, and in some cases also with the district centres.

As to the distribution of stations, the formation of districts, &c., various systems have been adopted. The most satisfactory results have been obtained where a fully-equipped section (not simply a hose-car or escape party) can reach any building in the city within seven minutes from the time of the call reaching the station, the seven minutes including for both turn out and run. Where there are exceptionally large or dangerous risks this time has had to be shortened to five minutes, and the possibility of an attendance from a second station assured within eight minutes. In dividing up districts the most satisfactory results were obtained where every house could be reached from the district centre within fifteen minutes from the call. Headquarters would naturally have a central position in the city. In one or two instances I have known the head-

* A paper read by Mr. Edwin O. Sachs at the Society of Arts, Wednesday, December 5.

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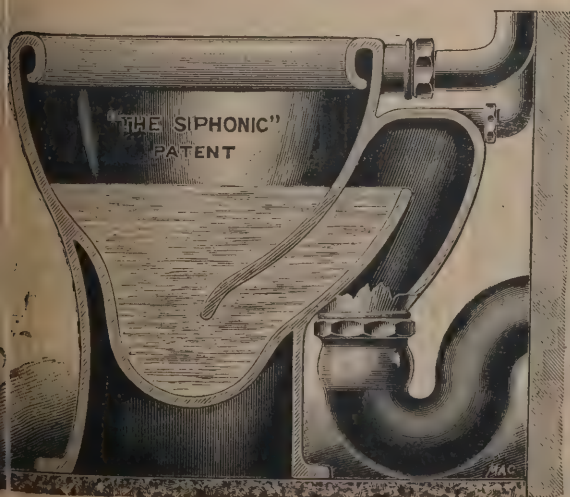
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quarters offices to be located in a separate building, which in no way served as a fire station, but simply as a centre through which all orders and business passed. I am no friend of this arrangement.

The different stations must of course be in connection with each other. Excepting in the one city already referred to, the special runner or rider has practically disappeared. Telegraphy and telephony take their place. Some cities favour Morse telegraphy. It certainly had great advantages over the telephone till within a year or so, as messages could be easily transmitted to several stations with the same effect, but telephone distributors have now been successfully introduced. Errors are, I believe, less frequent by telegraph than through the telephone, and there is always a record of every message. The most modern forms of telephone communication are, however, more suitable for the fire service than the telegraph, though I should by no means advise the great expense of their introduction where there is a good system of the older kind. Headquarters should be in direct communication with every station, but every station should be able to communicate with its neighbour directly, as well as through the headquarters office, and there should be a direct wire to its district station if it has one. There should be three routes of communication, so that two would be always ready for use in case of one breaking down. Either headquarters of the district centres would be in touch with the various auxiliaries referred to, as well as the general telegraph office and the telephone exchange.

As to the attendance at fires, some cities always only turn out one unit to answer the first call if they have no particulars, others always turn out two or three sections, and there are several cities that I know where the district centre would at least send an officer and a few men as well. In one brigade headquarters is always either represented by the chief or second officer in the case of a call of this kind. The idea is that it is always better to have too strong a force quickly in attendance than too small a number of men, and that it is omni-important that the first arrivals should be well handled. Further, if two sections answer a call and one breaks down on the road, there is no chance of there being too great a delay in the arrival of organised help. It should, however, as I said, not be forgotten that further calls in the same district to other fires are not unusual, and that the absence of too many engines on account of a first call is dangerous. In some cases when a call reaches the firemen one or two of the nearest stations turn out, and if

more help is required other sections will be called up individually. In others the reinforcements are not called up separately, but the fires are divided into three classes, small, medium and large, and on the message arriving of a more extensive conflagration, the sections always know beforehand if they must attend or not. First calls to certain classes of risks, say theatres or public offices, may always be considered to be for medium or large fires, and the same message will then simultaneously turn out the stronger body without any further detailed instructions having been necessary. In two towns I know the fire-call automats are so arranged that the messenger can already call for the different classes of fire. This is, however, not to be recommended, as an excited messenger will probably consider the smallest fire to be a gigantic blaze and will turn out too many engines.

It is quite impossible for me to here enter into a description of the appliances or working of brigades. Besides requiring some considerable time, I should have to describe a number of institutions individually, and that is not my intention now. I will only point out that where there is a high-pressure water-supply some brigades simply attend with hose cars, life-saving gear and ladders, or instead of the hose cars take their manuals, which they never use. Others take and make a point of it to use the manuals, and have a barrel with them ready to supply the first gallons of water necessary. Time is thus not lost in connecting with the nearest hydrant or plug, and in case of a hydrant being out of order there is always sufficient water at hand until the second hydrant has been found. Some cities always have an attendance of steamers, which are, however, only used in urgent cases. In other instances the steamer is once used in the same way as the manual, and this quite independent of the pressure there is in the water service. Where there is no good water service, manuals or steamers of course have to be sent out, and are either used off the low-pressure service or off the natural water ways or wells. Of course there are yet a large number of cities where the suburbs have no proper water service. The water barrel comes in very handy here for portage.

As to life-saving and manœuvring gear, some brigades rely almost entirely on long ladders, scaling ladders or telescopic escapes. In one city I know great confidence is placed in the jumping-sheet, in another chutes are much used, and there are a few where wonderful work is done with life-lines. Simply to indicate the diversity with which any one appliance can be treated, made or handled, in the fire service, I would mention



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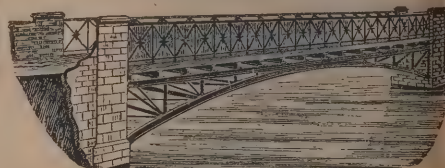
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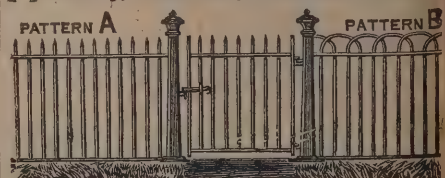


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that there are quite ten different ways in which a jumping-sheet can be held. Then there is the material of the jumping-sheet to be considered, the size and the shape, if round, oblong or square, then the means of holding it, the way to fold it, how and where to stow it, and at what distance from the endangered building the sheet is to be held. Last, but not least, come the words of command.

As to the working of brigades, I must limit myself to saying that there are, first of all, forces where all possible attention is given to the actual rapid turn out, whilst there are others where the speed at which engines are run to the fire is considered to be of primary importance. Other brigades, again, give equal attention to both. There are brigades which work entirely on military lines, each man having certain duties marked out for him beforehand for every possible occasion, and there are others where happy-go-lucky working is preferred. Of course there are combinations in the same way as regards command. I know one chief officer who always arrives at a fire with a staff of adjutants and orderlies and controls the working of his brigade from a position of vantage at a distance. Another chief of a strong brigade always delights to be in the thick of a fire, perhaps at the branch itself, or on some gallant life-saving exploit where he no doubt does good work as a fireman, but in no way fulfils the office of a commander. Officers must remember that they are officers and not rank and file, and this is generally very difficult to those who have advanced from the lowest grade. Superintendents, however smart, must leave acts of bravery to their men, and chief officers, without going to extremes, must always be in a good position where they can superintend everything pertaining to the outbreak in question. Some brigades seem to make a point of it to work quietly, and shouting is absolutely barred. All commands are here given by shrill whistles. In some brigades all commands are given by word of mouth and there is much bawling. In others commands besides being bawled are even repeated on horns, and the noise becomes ridiculous. As a rule, quiet working is a sign of efficiency.

Some brigades work as close as possible to the fire, others are satisfied with putting water on or about the fire from a distance. Some attack the fire direct, others only try to protect what surrounds the seat of the flames. In several brigades the orders are to always try and attack by the natural routes of the front door and the staircases. In others, the men always have to attempt some more unnatural entrance, with the aid of ladders—through windows, for instance. Some brigades care-

fully extinguish a fire, some simply swamp it. I know cases where officers will go so far as to let a roof that is alight burn itself out, simply keeping the surrounding walls, or say attic floor, damp. This prevents unnecessary water damage. The roof will have to be renewed any way; why, also, spoil a number of rooms below? Handled by judicious officers, several brigades have been able to boast of never having damaged property unnecessarily. They have, for instance, had the patience to suffocate a cellar fire instead of putting the whole cellar under water. In certain classes of property the bucket, the hand-pump and the mop have been far more effective in minimising actual destruction than hose, which can ruin more by water than the damage by fire would have. It is one of the easiest signs to judge the training and handling of a fire brigade by to see what damage they do. Even an inconsiderate smashing of doors and windows, when there is absolutely no need for it, can be avoided, where every man in the force feels that his first duty is to prevent damage and loss, and his second to extinguish the fire.

Where the brigade includes a salvage division, it is generally stationed at headquarters; where this division is split up into sections, there would also be a distribution among the district centres; the salvage men are simply part of the force, told off on special duty. Where there are private salvage corps, their stations are generally near the headquarters or district centres of the brigade, from which they receive notice of the fire. In some cities the salvage corps work quite independently; in others they work under the chief of the brigade directly they arrive at the fire.

I am afraid I cannot even touch on the working of other auxiliaries excepting to say that there are a number of cities where the advantage of firemen having plenty of room to work in is fully recognised, and the police are at once called out with the fire brigade and brought on to the scene in an incredibly short time. There are always vans ready horsed at the police headquarters to take out a squad of men when the fire-call comes, and a certain number of mounted men are also kept ready for this purpose. The value of these measures should not be underrated, especially in cities prone to rowdiness or political demonstration. If the firemen are unpopular their work will be doubly difficult for them. By-the-by, there is, however, one thing I cannot omit, and that is to point out the value of firemen being trained ambulance men, especially in such localities where independent ambulance corps do not attend fires.

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IN the Scottish Courts the Second Division disposed of an appeal by George Todd, wholesale hardware merchant, 71 to 85 Candleriggs, Glasgow, against a judgment of the Dean of Guild Court, Glasgow, in a petition by the appellant for a warrant to execute alterations on subjects owned by him on the north side of Wilson Street, Glasgow, being the flat immediately above the shop No. 10 Wilson Street. John Wilson, C.A., Glasgow, judicial factor on the trust estate of the deceased Thomas Forrest, rope and twine manufacturer, as proprietor of the shop No. 10 Wilson Street, and of the basement flat, lodged objections. The objector said the tenement was originally built for occupation as shops on the ground-floor and dwelling-houses above, and access to the upper flats of the tenement is obtained by a common stair entering from the close, No. 12 Wilson Street. The gables at the east and west ends of the tenement are not mere gables but form part of the tenement itself. The flues or chimneys for the fireplaces in the objector's shop pass up through the gable forming the eastern wall of the tenement. The petitioner, he said, proposed to break through the two gable walls separating his present warehouse from the flat above the petitioner's shop, and to use the flat for the storage of goods. The petitioner's stock was of an inflammable description and hazardous from an insurance point of view, and the result of the petitioner occupying this additional flat would be to subject the objector's shop to additional risk of fire. The objector pleaded that it was incompetent for the proprietor of one flat of a tenement to connect it with the adjoining building by cutting through the intervening gables. The petitioner pleaded that being the sole proprietor of the portion of the gable through which the proposed entrance was to be formed, and the alteration being safe, he was entitled to decree. Dean of Guild Guthrie Smith sustained the objections and refused the lining with expenses. The Second Division, on appeal, recalled the Dean of Guild's interlocutor, and granted warrant with expenses.

Lord Trayner, who delivered the leading opinion, said:—The appellant is the proprietor of certain heritable subjects in Wilson Street, Glasgow, described in the petition as "the flat immediately above the shop No. 10 Wilson Street." He is also proprietor of the tenement or part of the tenement immediately to the east of that first mentioned, and he has made application to the Dean of Guild for warrant to carry out certain alterations on these properties, conform to plans produced. One of the proposed alterations is to make a connection between the two

properties by breaking through a doorway or passage in the gable walls of the two properties respectively, and thus enabling the petitioner to have direct access to the flat above No. 10 Wilson Street from his property lying to the east thereof. The respondent, who represents the owner of the shop No. 10 Wilson Street, objects to the proposed alteration on two grounds embodied in his pleas in law, which are as follows:—(1) It is incompetent for the proprietor of one flat of a tenement to connect it with the adjoining building by cutting through the intervening gables. The alterations proposed being unsafe, the petition ought to be dismissed. The Dean of Guild has sustained the first of these pleas and refused the lining craved. He has not dealt with the second plea in so far as it covers the other proposed alterations, that being unnecessary in the view on which he has proceeded. I am of opinion that the judgment of the Dean of Guild is erroneous and ought to be recalled. The Dean of Guild has proceeded upon the authority of the case of *Gellatly v. Arrol*, which he regards as a decision ruling the present case. No doubt that case presented some features of similarity to the present; but the two cases are distinguished by this very material circumstance, that in *Gellatly's* case the interference with the gable which was held to be illegal was an interference which resulted in injury to the vents or chimneys in the gable belonging to the other proprietors; whereas here no such injury is alleged on record, and it was admitted at the bar that no such injury would be inflicted by the appellant's proposed operations. In the opinions delivered by the judges in *Gellatly's* case there are other considerations referred to and which perhaps affected the decision; but the real ground of judgment was that the operations there complained of were illegal in respect they were an invasion of the legal rights of others. So regarded, the decision in *Gellatly's* case does not rule the present. I am not prepared to admit that the proposition set forth in the respondent's first plea is necessarily and in all cases a sound statement of our law. If it were it would impose a restriction on the rights of property which so far as I know has not yet been imposed by our law, and a restriction which would prevent a proprietor making a use of his property which might be advantageous to himself and yet in no way injurious to his neighbour. If the gable in question had been the common property of the different proprietors in the tenement the case would have been different, because there can be no interference with common property except by consent of all the proprietors. Such, however, is not now regarded as the character of the right which the several

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proprietors of a tenement have in the gable walls of their property, although that view found favour with at least one of the learned judges who decided the case of Gellatly. My opinion is that the operations on the gable proposed by the appellant are operations *in suo*, and, not affecting the rights of any others, ought to be allowed. I should therefore be disposed to recall the judgment appealed against, repel the respondent's first plea in law and find that the appellant is entitled to the lining and warrant prayed for in so far as concerns his proposed alterations on the gable walls. As the objection raised by the second plea in law covers a matter of fact set forth in the sixth article of the objections for the respondent, with which the Dean of Guild Court has not dealt, the case, so far as that point is concerned, will require to go back to him.

INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting, Sir Robert Rawlinson, K.C.B., president, in the chair, the paper read was on "Colliery Surface Works," by Mr. E. B. Wain.

As an instance of the development of mining operations during the past twelve years, the North Staffordshire coal-field was cited, where the output had been increased 40 per cent, and this was due to the fact that there was hardly a colliery in the district the plant of which had not been considerably improved during the period referred to. Under the varying conditions consequent upon the increasing depth at which it was necessary to work the coal the work of laying out the surface works was said to have been one of evolution, and comparisons between such works and those laid out recently on modern principles for a definite output would probably indicate much waste and inconvenience resulting from spasmodic and desultory extensions. It was of the highest importance that the works should be concentrated as far as possible, so as to permit efficient supervision and to reduce the staff of mechanics and general labourers. An example case was mentioned of a colliery where, in 1876, six small and scattered plants were at work on the property, and were raising less than one-half of the material now being obtained from two shafts. As the plant at each shaft required its staff of engine-men, stokers, pit-banksmen and foremen, it was evident that great economy was effected by reducing the number of such establishments. In the instance mentioned, the reduction in surface charges effected by concentration was 4.67d. per ton.

Where practicable, the railways should be arranged so as to allow a gentle descent for the waggons to and from the screens; if the nature of the ground would not admit of this, endless ropes working between the rails were of great service. In no case ought dead-end sidings to be used if a regular output was to be maintained, as the loss of time in shunting waggons would cause serious hindrance to the coal-winding. It was also desirable that each quality and size of coal should be delivered on a separate road, so as to allow of continuous loading. In a set of colliery sidings so laid out, the cost of shunting was only 0.09d. per ton, or about 0.5d. per ton per mile. The author was of opinion that it was not advisable to undertake new work of importance in colliery workshops, but to use them simply for the purpose of making such repairs as might be necessary. In districts where there were good engineering works near to the collieries, even a portion of the repairs might with advantage be sent out; but where there were not facilities for doing it near at hand, it was of the highest importance that all tools and machinery for maintenance should be provided at the colliery. Where practicable, the workshops should be built on a level with the pit-bank, and light tramways of the same gauge as that of the underground roads should be provided to facilitate the transport of material from the shops to the pit-shaft. The particulars were given of a range of workshops used at a colliery raising 2,000 tons per day, with details of the construction of the safety-lamp room and cost of cleaning, &c., lamps. Creeper-chains, gravity roads and balance cages worked in connection with double-deck pitbank platforms were described; also Fowler's hydraulic arrangement for use where more than two decks had to be changed. The most convenient size of pit waggons was discussed, a gross weight of 18 to 20 cwt. being mentioned as the maximum which might be conveniently handled. Four types of tiplers—the ordinary back tiplers, Rigg's and mechanically worked end-and-side tiplers—were described, the side tiplers being considered the most generally useful.

The subject of screening and picking apparatus would, in itself, afford material for a lengthy paper; the author, therefore, only briefly noticed some of the types of screen in general use. In laying out the heapstead, it was important that there should be sufficient height between the pit-banks and screen-siding levels. The height would vary considerably according to the type of screen and the number of sizes desired. In general practice it was found that fixed bar-screens with not less than 20 feet was required, if the coal was to be separated



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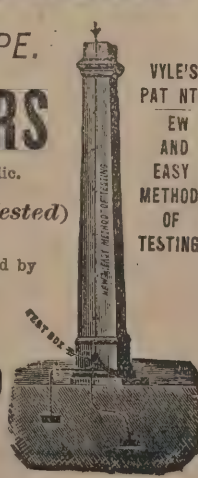
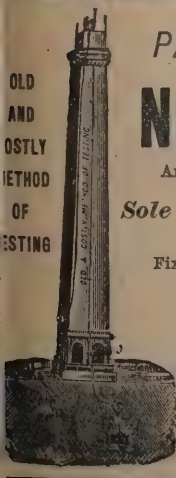
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into three sizes, whilst with jiggering screens it was possible to do the same work with 16 feet where no picking-belts were wanted. Fixed bar-screens were said to be objectionable on account of the steep gradient and consequent breakage of the coal in screening. Mechanical screens might be classed under three heads:—First, revolving barrel screens; secondly, endless-belt screens, such as the Lührig belt and the Greenwell screen, and, thirdly, jiggering screens. For dealing with a large output from a tender seam, containing a high proportion of small, the author advocated end-driven jiggers with a flat gradient and driven by cranks or cams with a throw of 4 to 5 inches, working at about 100 revolutions per minute. The Greenwell screen, suitable as serving both as picking-belt and screen, was noted as being specially advantageous where little elevation was available. The particulars were given in a tabular form of several modern winding plants, with the speed of winding the average load, and the maximum possible quantity which could be raised per shift of eight hours. As example, a net load of 52 cwt. of coal was raised 550 yards in 44 seconds, with an average speed of $37\frac{1}{2}$ feet per second, and a maximum speed of 60 feet per second. Under such circumstances all complications in the winding-engines must be avoided. With the higher steam-pressures now used, there should be, however, no difficulty in taking advantage of compound working, provided the high and low-pressure cylinders were both duplicated. Owing to the variable load due to the decreasing weight of the rope in ascending and the increasing weight in descending winding-engines were generally wasteful in working. There were various contrivances to balance the load, but the best and simplest was a plain balance rope worked with a parallel drum. The economy of fuel in colliery work had received too little attention in the past, the boilers being often supplied with inferior coal or slack which had been considered unsaleable. The amount of coal consumed in colliery work was probably not less than 5 per cent. of the total output of the kingdom, and as slack had now become more valuable, colliery engineers were beginning to give greater attention to the questions of compound working, expansion gear, condensation and balanced loads. The engines had been, as a rule, designed to admit steam into the cylinder for almost the whole length of the stroke. Although such an arrangement enabled the inertia of the load to be more easily overcome in starting, the back-pressure was considerable in the cases of engines running at high speeds, and it was by no means uncommon to obtain from engines working at 80 lbs.

per square inch diagrams giving a back pressure of 10 lbs. per square inch. The general practice was now, however, to cut off steam at about 20 per cent. before the end of the stroke. Condensation, as applied to modern winding engines, could only be said to have reached the experimental stage, but it was probable that independent surface-condensing apparatus, to maintain a steady vacuum, would be largely used in the future in colliery works.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

22407. Samuel Gratrix, jun., & Brother, Limited, and Henry Brocklesby, for "Improvements in or applicable to flushing cisterns."
 23469. John Thomas Tennant, for "Improvements in flushing apparatus for water-closets and the like."
 23473. Herbert Edwin Baden, for "Improvements in water-closets."
 23526. Isaac Barnsley, for "Improvements in the construction of baths, traps for baths, lavatories and other purposes."
 23626. Daniel Keith and William McGeoch, jun., for "Improvements in and relating to window-sash frames."
 23709. William Barraclough and Albert Rhodes, for "Improvements in and relating to fireplaces."
 23795. Moses James Adams, for "Improvements in sanitary closets."
 23808. Richard Ames, for "Improvements in machines for manufacturing drain, sewer and like pipes."
 23814. William Mockett, for "Ventilation of main and other sewers."
 23819. Charles Bristow, for "Improvements in surveyor's adjustable centreing rod."

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[Extract from a lecture on Architects' Libraries by Professor Roger Smith, F.R.I.B.A., at University College, October 10, 1893.]

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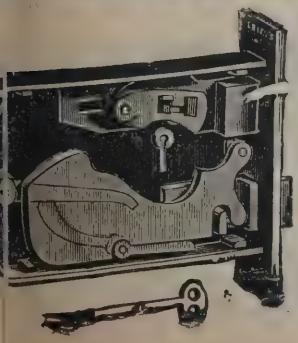
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Lee & Son, High Wycombe	509	0	0
R. Pilgrim, Reading	494	11	0
E. Iles, Mitcham	483	0	0
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F. Talbot, Reading*	439	7	8

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F. Talbot	484	2	3
Free & Sons	480	0	0
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J. Shaddock, Mutley	£2,500	0	0
A. DELBRIDGE, Camborne (accepted)	2,450	0	0
J. Julian, Truro	2,416	0	0
J. Bunt, Bodmin Road; St. Austell	2,333	0	0

WELLINGBOROUGH.

For Alterations and Repairs to Buildings at Sewage Farm,
Irthlingborough Grange, for the Wellingborough Local
Board. Mr. EDWARD SHARMAN, Surveyor, Market
Square, Wellingborough.

R. Marriott, Wellingborough	£165	0	0
Hacksley Bros., Wellingborough	135	0	0
G. A. Smith, Wellingborough (accepted)	113	15	0

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H. BARRACLOUGH, Brighouse (accepted) . . . £438 10 10

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W. Richardson, Outwood, excavator, bricklayer and mason	500	6	11
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G. A. Beaumont, Lofthouse Gate, near Wakefield, plumber, glazier, gasfitter and painter	50	10	0
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W. Griffin, Broadstone	£3,943	0	0
Webb & Co., Salisbury	3,873	0	0
Merrick & Son, Glastonbury	3,802	0	0
Mould Bros., Bath	3,679	0	0
Burt & Vick, Poole	3,672	0	0
W. E. Alexander, Ringwood	3,672	0	0
H. Barrow, Ringwood	3,433	0	0
Jenkins & Son, Bournemouth	3,393	0	0
A. E. Begwood & Co., Melksham	3,389	0	0
G. Moore, Trowbridge	3,342	0	0
Lindsay & Francis, Trowbridge	3,173	0	0
HAYWARD & WOOSTER, Bath (accepted)	3,099	0	0
R. Elcock, Wimborne	2,945	0	0
W. King, Ferndown	2,292	0	0

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TRADE NOTES.

WE have received from Mr. Robert Hammond a copy of his pamphlet on electric light. It has been drafted to give concisely all possible information in regard of municipal lighting.

WE hear that the National Accident Prevention Window Co., Limited, of 34 New Bridge Street, Ludgate Circus, owing to the large increase in their business, have had to provide themselves with more extensive premises. The address of the company's offices and showrooms is now 159 Victoria Street, Westminster, S.W.

WE are informed that Messrs. Cassell & Co. have recently arranged to reissue Mr. Stevenson's "Treasure Island" in their boys' paper *Chums*, with new illustrations expressly executed.

THE Board Schools, Silloth, Cumberland, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland & Brother, of Manchester.

WE learn that Comyn Ching & Co., Castle Street, Long Acre, have been successful in obtaining the contracts for providing and fitting up the elaborate steam and gas-cooking apparatus for the kitchens in the new Post Office buildings in St. Martin's-le-Grand, on the same principle as already supplied by them at the G.P.O. at Birmingham, Newcastle-on-Tyne, and the new Parcel Post Dépôt, Mount Pleasant, &c.

THE Leeds School Board have had placed a new eight day illuminated turret-clock for the Hunslet new Board School, one of the most thickly populated manufacturing parts of the city of Leeds, which will be a great boon to the inhabitants. The work has been carried out by Messrs. Wm. Potts & Sons, clock manufacturers, of 13 Guildford Street, Leeds, and Newcastle-upon-Tyne.

THE Queensferry Bridge committee have received tenders for the work of putting a bridge over the Dee. Twenty-five tenders have been received from leading engineering firms in various parts of the country.

At the special meeting of Greenock Harbour Trust it was agreed to proceed to Parliament with a Bill to alter and extend the powers of the trustees of the port and harbour of Greenock in relation to the warehousing of goods, and for other purposes.

VARIETIES.

AN inquiry has been held at the Salford Town Hall on behalf of the Local Government Board, with regard to the application of the Salford Corporation for sanction to borrow 30,000*l.* for gasworks purposes.

AN application has been made to the Local Government Board by the Lancaster Corporation to borrow 62,000*l.* for constructing a second reservoir, capacity of 126 million gallons, and the inquiry has been held. It was stated that 133,000*l.* had been already spent on the water-supply.

THE *Leeds Mercury* says:—From several competitive schemes that of Mr. A. E. Preston, of Bradford, has been selected. By its adoption the sewage of Pateley Bridge and Beverley will be conveyed by pipes down the valley for a distance of about a mile and a half, where, after passing through filter arrangements, it will be disposed of by irrigation. The probable cost of the sewage scheme is 6,000*l.*

THE Secretary of State for Foreign Affairs has received from Her Majesty's agent and consul-general at Sofia a copy of an invitation for tenders for the works to be undertaken in connection with the harbour at Varna. The total cost of these works is estimated at 8,300,000 francs (332,000*l.*), and a deposit of 415,000 francs (16,600*l.*) will be required. The adjudication will take place on February 11 (January 30) next. The copy of the invitation to tender may be seen on application to the Commercial Department, Foreign Office, between the hours of eleven and six. Any further information may be obtained from the technical committee of the Railway Department in Sofia.

AT the meeting of the Bournemouth Town Council the Mayor read a letter from Sir George Meyrick's solicitors, in which it was stated that Sir George would be willing to hand over the cliffs to the borough as pleasure-grounds, providing the question of an undercliff drive was finally settled, including the approval of plans and estimates showing the scheme to be feasible, and further, that he was prepared to contribute to the cost, but to what extent would depend very much upon what the cost of the scheme would be. The cost has been put at various estimates, from 60,000*l.* to 100,000*l.*

AT the meeting of the City Commission of Sewers a report was brought up from the finance and improvement committee relative to the communication from the County Council as to the widening of Thames Street and forming a northern approach to Tower Hill. They recommended that it be

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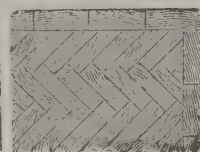
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intimated in reply that the Commission would be prepared to enter into the arrangement suggested by the County Council, viz. that the Commission should carry out the City portion of the approach to Tower Bridge, estimated to cost 63,050*l.*, the County Council paying half, and the Council also contributing one-third of the cost of the improvement in Thames Street estimated to cost 37,500*l.* The adoption of the report was agreed to.

At Birkenhead a Local Government Board inquiry has been held into an application by the Corporation for sanction to borrow 20,000*l.* for electric lighting, 10,000*l.* for works of street improvement and sewerage, and for fencing in the Bridge Street depôt, and 5,000*l.* for the erection of a fire station and the purchase of a steam fire-engine and appliances.

The special committee of the Glasgow Town Council for carrying out the building of the East End Palace have decided to alter the site from the foot of William Street to a place on the Green near Monteith Row, the latter being a much more central site.

A SERIOUS subsidence has occurred at Marton, in the Cheshire salt district, on the farm of Mr. Moreton. A large lake was formed some years ago by subsidence. Six hundred additional square yards of land have now gone down, closing a public footpath and entailing serious losses on the landowner and tenant.

ONE of the largest of the chimney stalks belonging to the Burntisland Oil Company has been taken down. The stalk was 160 feet high, and owing to the top portion having become dangerous, it was deemed advisable to take the whole structure down. The method adopted was to wedge up where the bricks were displaced at the base and saturate the wedges with paraffin oil and ignite them. Just as the workers had finished operations and were approaching to set fire to the saturated wedges the structure was observed to sway, and it went tottling down on to the refuse heap behind the works.

At the meeting of local members of the Institution of Mechanical Engineers and other prominent engineers of the city and Clyde district, held in Glasgow, Sir Renny Watson presided, and stated that the Institution proposed to hold the summer meeting of 1895 in Glasgow, under the presidency of Professor Alexander Kennedy. The chief business of the meeting was the appointment of an executive committee, and accordingly a list of names of representative engineers of

Glasgow and the Clyde district was drawn up and adopted, subject to the consent of the gentlemen nominated, and with power to add to their number.

A DESPATCH has been received from Her Majesty's Consul at Rio Grande do Sul reporting that the State Government will receive before January 18, 1895, tenders for the improvement and maintenance of the navigable channels between the Rio Grande bar and Porto Alegre, as well as the Sangradouro channel in Lake Mirim and those about the Pelotas bar. The plans can only be seen at Porto Alegre, Rio de Janeiro, Montevideo and Buenos Ayres. This notice is published in case any contractor in the United Kingdom may wish to tender through his agent in South America.

THE CEMENT TRADE AND ADULTERATION.

THE cement trade recently held a meeting at the London Chamber of Commerce for the purpose of receiving and adopting, or otherwise, certain recommendations of the special committee which had been appointed to investigate and report upon the extent of the practice of admixtures with Portland cement, and as to the justifiability thereof. The trade, with only one dissentient, adopted the recommendation of the committee, that it was advisable that all manufacturers of Portland cement who have used any outside material or materials in the manufacture of that article should at once discontinue the practice. The use, however, of not more than 2 per cent. of gypsum, as practised by the German manufacturers for the purpose of regulating the setting of the cement, is considered optional. Messrs. Stanger and Blount, who are experts, have been instructed to report early in January, if possible, on the admixtures with Portland cement on the Thames and Medway, and the extent to which they are used.

THE COUNTY COUNCIL AND THE WATER COMPANIES.

EIGHT Bills are to be promoted by the London County Council next session for the acquisition of the metropolitan water companies. Relating to the New River Company, the preamble of the Bill recites the Acts which govern the company's supply and the districts which are included within its limits, and

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The President of the North of England Association of Gas Managers, in his Inaugural Address delivered at Middlesbrough on October 7, 1893, spoke of the light as "The latest development in economical lighting by gas . . . which reduces the cost to ONE-SIXTH OF OUR STANDARD (i.e. the Argand) or one-fifteenth of the cost of electric light" (see *Journal of Gaslighting*, October 10, 1893).

Herr Dicke, in a paper read before the German Gas Association, stated the AMOUNT OF HEAT developed by the different sources of light to be as follows:—

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ORDINARY BURNERS, 50 calories per candle per hour.

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ARGAND

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tates that "the rates of charge which the East London Company are authorised to demand are higher than those authorised in the case of the New River Company, while the East London Company do not supply water up to the same height as the New River Company are required to supply it, and the rates of charges which the West Middlesex Company can demand are considerably less than those of the New River Company;" that "the New River Company are supplying water within a portion only of their district, and the East London Company are supplying within part of the New River Company's district at higher rates of charge to the consumer, and the New River Company are also supplying within part of the West Middlesex Company's district at higher rates of charge than the West Middlesex Company would be authorised to make." The conclusion is that it is expedient that, in default of agreement between the Council and the company, the undertaking should be transferred to the Council. The Bill then goes on to enact that the transfer shall take place on December 31, 1895, or such other date as may be agreed upon, that the transfer may be by agreement as to terms, or, failing agreement, "on such fair and reasonable terms, having regard to all the circumstances of the case, as may be determined by arbitration." The arbitrators are to be chosen one by each of the parties, and may, if necessary, appoint an umpire or engineer, barrister, solicitor, surveyor, accountant, or other person, having special knowledge of any of the matters referred to arbitration, to act as assessor. In determining the fair and reasonable value of the undertaking the arbitrators are to have regard to the following matters:—

"The condition and state of repair of the reservoirs, filter-beds, filtration arrangements, wells, mains, conduits, pipes, machinery and plant of the New River Company, and the probability of future expenditure thereon, together with any liabilities or obligations in connection with the water undertaking which the New River Company may reasonably be required or expected to incur.

"The legal powers of the New River Company to take water and the probability of such powers being limited.

"The adequacy and efficiency of the present sources of supply and of the reservoirs, filter-beds, filtration arrangements, wells, mains, conduits, pipes, machinery and plant of the New River Company to meet present and future requirements.

"The probable necessity of the future introduction of a new source of supply, or new and improved works.

"The legality of the charges now made or claimed to be

made by the New River Company, together with the circumstances under which such powers of charge have been granted by Parliament.

"The deductions from any compensation claimed by the New River Company which may in the opinion of the arbitrators be reasonably made in respect of any insufficiency of the present storage or filtration of the New River Company, or in respect of the provision of supplementary supplies.

"The deductions to be made in respect of works plant or appliances which have become wholly or partially useless, and the adjustment of the revenue account of the New River Company in respect of repairs and renewals properly chargeable thereto.

"The statutory powers of any other company to compete in any other part of the New River Company's district, and the rights of any other company or body to supply water in the New River Company's district, whether as now existing under statute or otherwise, or as may be likely to exist in the future.

"The effect of the amendment of the New River Company's Act of 1852, and the incorporation of section 35 of the Waterworks Clauses Act, 1847, with the New River Company's Acts."

No allowance is to be made in respect of any claim by the company to divide profits in respect of "back dividends," or in respect of any assumed future increase of the rateable value other than an increase due to alterations or additions involving increased supply of water, and no addition is to be made to the fair and reasonable value of the undertaking in respect of compulsory sale. It is also provided that if the Council so require the consideration to be paid for the transfer should be in the form of a half-yearly or other periodical payment charged upon the county fund for a period of not less than 80 or more than 100 years. Power is proposed to be given to the Council to inspect the accounts and works of the company; the officers of the company are to become the officers of the Council, and in case of the abolition of any office the existing occupant is to be compensated. Provision is also made as to the supply of districts outside London and for selling portions of the works to any other local authority.

The other Bills dealing with the East London, West Middlesex, Lambeth, Kent, Southwark and Vauxhall, Grand Junction and Chelsea Water Companies respectively are on much the same lines, with this difference, however, that they omit the provision with respect to the consideration being paid half-yearly over a series from 80 to 100 years.



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LEAD IN WATER.

AT the last meeting of the Yorkshire medical officers of health at Huddersfield papers were read on the subject of lead in potable water. The first paper was by Dr. Evans (Bradford), who pointed out the chemical action of water upon lead service-pipes, and said that if lead were dropped into carefully-distilled water and left for a time, at the bottom would be found a white precipitate, which, on examination, was found to consist of oxide of lead and hydrate of lead, generally known as oxy-hydrate of lead. The solution of this in the water was a subsequent process. This oxy-hydrate of lead, he believed, was due to the action of the oxygen in the water upon the lead pipe that might be exposed to its influence. But, it might be asked, "Where did the oxygen come from?" because the water was not decomposed. He had come to the conclusion that the oxygen was produced by being actually dissolved in the water itself, while it might also be due to the presence of oxidising agents in the water itself, however carefully distilled. Dr. Whitelegge (West Riding County Council), who followed, said he had been watching for the last two or three years, experimentally and otherwise, the action of a number of water-supplies upon lead, and the results differed in some cases from those that they were entitled to expect from the accounts of early experimenters. In many of the experiments made erosion had been completely lost sight of. He agreed that the water they had most trouble with was the acid or moorland waters, and many peaty pools were the most active of all. The action, however, was by no means limited to acid or soft waters. The power of some waters could be removed by the addition of chalk, and of others by the addition of carbonate of soda; but these two would not act in all cases, and they had to be careful about dogmatising on the matter. This question of erosion deserved more attention because there was no doubt that if water was left standing all night in a lead service-pipe, there was lead present in poisonous and dangerous quantities in the morning, so that the first flow of water ought to be always allowed to run to waste. He had come to the conclusion that there were many more public water supplies in the West Riding which acted upon lead than was at present suspected, and as medical officers of health they ought not to assume that the water under their charge did not act upon lead, but see by experiments whether there was not lead in solution. He had, he said, mentioned two methods of preventing water acting upon lead; but there was a third, and

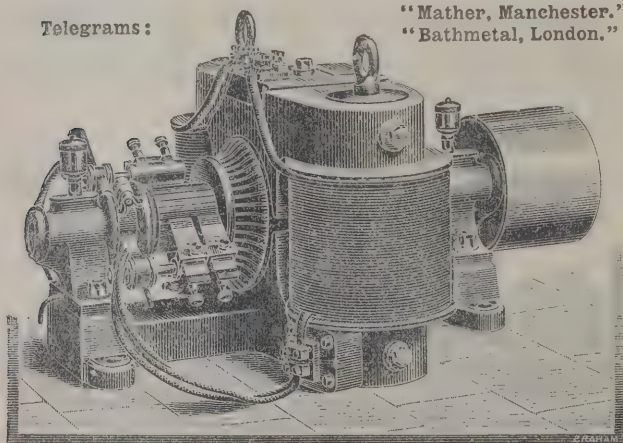
that was by the treatment of filtration, though to his mind there was a tendency to assume that filtration could do too much. In conclusion, he urged more co-operation amongst medical officers of health in regard to this important question. Dr. Hunter (Pudsey), who spoke as one who had gone through a lead epidemic, pointed out that the lead deposits through drinking contaminated water were so slow as to cause an endless variety of symptoms. This accounted for mistakes in diagnosis which resulted in cases of plumbism often not being recognised as such. Blindness, weakness of the procreative organs, abortion, brain disorders, liver complaints and many other complaints of a fatal nature he had known to arise from the presence of lead in water, and at one time in Pudsey he had known the first flow of water in a morning contain as much as from half to a whole grain per gallon, and then plumbism was at its height. Dr. Swann (Batley), in his paper, pointed out that in the case of the lead-poisoning in Louis Philippe's family at Claremont, the water was found to contain seven-tenths of a grain per gallon and 34 per cent. of those who drank this water were affected. If this were the case, it was a matter which the public would have to face before long, whether they could go on taking water containing 1-100th of a grain for years with impunity. He instanced a number of cases of illness which he attributed to the lead in the water, and which disappeared when iron-piping was substituted for the lead-piping.

HANDSWORTH, BIRMINGHAM.

THE general purposes committee of the Handsworth Local Board has prepared a report on the growth of the district and the work of the Board since the constitution of the district in 1874. It states that the Urban District Council to be elected on the 17th inst. will on the 31st take over the work hitherto performed by the Board. On December 2, 1874, Dr. Welch, the medical officer of health, presented his first report to the Local Board upon the sanitary condition of the district, and pointed out the conditions which endangered the health of the inhabitants. At that time, even in the better class of residences, grave sanitary defects were often, if not commonly, present. The houses occupied by the working people were generally built in rows, back to back, or with windows and doors in one side only. The ventilation was therefore very imperfect. The cottages were built in the cheapest possible manner, the external walls being in many cases only $4\frac{1}{2}$ inches

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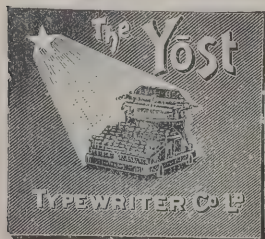
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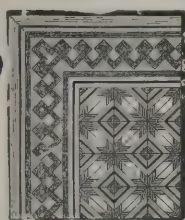
thick, and damp. The drainage of the district was in the highest degree defective, the sewage matter in most cases being drained into dumb-wells sunk in the gardens and yards belonging to the houses, and the dumb-wells were often unemptied for years. The drainage of the district was surrounded by difficulties, and the earth, air and water were being polluted with sewage. At that time there was not a properly constructed sewer in the district, but the drainage from a considerable number of houses was carried into drains which had been laid for draining highways (which were unfit for carrying sewage), and through such drains found its way into watercourses. The Local Board as soon as possible proceeded to deal with the question of sewerage the district. All the streets in Handsworth which are built upon are now sewered, the total length of sewers in the district being $31\frac{1}{4}$ miles; and all the houses, except a few in the rural parts of the district, are connected therewith. The Local Board have borrowed and expended in sewage works 76,250*l.*, of which sum 25,200*l.* has been repaid. For the treatment of sewage from Handsworth and establishment charges, the Local Board paid the Drainage Board last year 1,650*l.* 11*s.* 2*d.* Nearly every street and road in the district has been widened and improved, 31,000 square yards of land having been acquired by the Board and thrown into the roads. There are about thirty miles of dedicated roads in the district. About fifty miles of footpath have been kerbed, channelled and paved. The Board have borrowed and expended 25,712*l.* in works of street improvement since June, 1876; 10,414*l.* of that has been repaid. In 1874 the number of street lamps in the district was 364; there are now 880, lighting about thirty-three miles of streets. In 1878 the Handsworth Fire Brigade was established, and in May, 1890, a branch fire station was established at Perry Barr. For four or five years after the constitution of the district, the Local Board met in a room measuring 16 feet 6 inches by 15 feet, in an old building in Baker Street, called the Parish Offices. In May, 1877, the Local Board purchased the Waggon and Horses Inn, with the land belonging thereto (the total area being about an acre), as a site for new offices, and shortly afterwards erected the present offices, lecture hall and public library buildings. The total cost of land, buildings, fittings, furniture, &c., was 20,662*l.*, of which sum 7,246*l.* 3*s.* 11*d.* has been repaid. The medical officer reports the health of the district has for many years been most satisfactory, and that the death-rate compares favourably with that of any neighbouring district. The report deals with the growth of railway and

tramway accommodation in the district since the formation of the Board; and with reference to the litigation undertaken it is pointed out that in every case to which the Board has been a party the court has decided in its favour, with costs. In 1888 the Board purchased and laid out the Victoria Park, containing 20½ acres. Shortly afterwards they acquired three acres of the adjoining land. They have recently entered into contracts for the purchase on favourable terms of 16½ acres of land from the Ecclesiastical Commissioners, and of 20½ acres of Mr. Philip Williams to extend the park. When it is extended its total area will be 60½ acres, and an additional entrance will be provided in Hamstead Road for the convenience of the inhabitants living in that part of the district. The public library was opened on May 1, 1880, and up to that time 5,150 volumes had been purchased, and the amount expended was 789*l.* 13*s.* 7½*d.* There are now upwards of 700 musical works in the library, and the circulation of those works last year numbered 2,178. On the opening of the library there were 120 books in the reference library. There are now upwards of 1,600. On the opening of the library there were 5,150 works on the shelves. There are now 11,000 on the shelves and in circulation. In 1885 a branch library and newsroom were opened at Perry Barr to meet the convenience of ratepayers living in that part of the district. The accommodation at the central library and newsroom being altogether inadequate, the buildings were in 1890 extended and remodelled, costing upwards of 2,000*l.* Thornhill House was rented as a technical school at 50*l.* per annum. Plans of the new technical school, to be erected on land recently acquired by the Board at the corner of Golds Hill Road and Stafford Road, were being prepared, and would shortly be submitted for approval. The Board have raised twenty-two loans, amounting altogether to 133,824*l.*, at low rates of interest. Of this sum 43,507*l.* 14*s.* 2*d.* has been repaid to the mortgagees, leaving 90,316*l.* 5*s.* 10*d.* the amount of principal still owing. The amount in the pound of the general district rate has not been increased for fifteen years. It is 3*s.* in the pound (per annum) including the free library and technical instruction rates. The rate is a low one, having regard to the character of the district and the public works which have been executed. The area of the district is 3,647 acres. Its population, according to the census of 1871, was 14,359. It is now 38,500. Rateable value of the district in 1874 81,859*l.*, and the assessable value 17,704*l.* The rateable value now is 167,352*l.*, and the assessable 158,629*l.* The death-rate was 17·5 in 1874, 19·5 in 1875, and 12·9 in 1893.

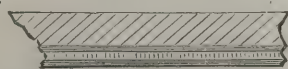
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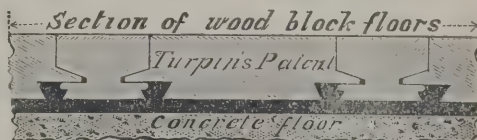
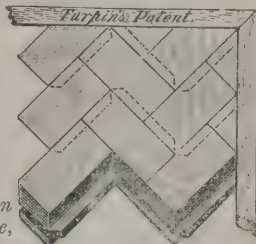
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THE NAVIGATION OF THE SEVERN.

MR. E. D. MARTEN, engineer to the Severn Commission, has presented a report to the committee of works and finance and for general purposes on his visit to Paris, with a view to obtaining information as to the navigation of the Seine by sea-going vessels up to that city, and its bearing upon the development of traffic upon the Severn. Mr. Marten states that "from the sea to Rouen, a distance of about eighty miles by river, the Seine is tidal, with a working depth of 22½ feet. From Rouen to Paris the river is canalised, in a similar manner to the Severn between Gloucester and Worcester, by means of nine locks and weirs. The distance between Rouen and Paris, although only seventy miles as the crow flies, is no less than 150 miles by river, and yet, notwithstanding this extremely tortuous course and the fact that there is railway competition the whole way, about 4,000,000 tons were carried upon the river in this section in 1893, of which quantity only about 100,000 tons was local traffic not subject to railway competition. This section of the river has been more or less canalised for many years; but the work had been so imperfectly accomplished in the first instance that in or about the year 1878 works were carried out by which the minimum depth of the channel has been increased from an uncertain 5½ feet to 6 feet to a constant depth of 10 feet 5 inches. It will be seen that these works have, therefore, had much the same effect as those which have recently been carried out upon the river Severn between Gloucester and Worcester, where the depth has been increased from 6 feet to 10 feet, and I am glad to be able to state that the increased traffic resulting from the Seine works is eminently encouraging to all persons interested in the navigation of the Severn, as thus improved. The works have cost nearly 2,500,000^l, and have been carried out at the cost of the State. The river is now maintained toll free by the State, as it was also prior to the improvement works." After explaining various engineering details, Mr. Marten says:—

"I saw and learnt enough during my stay in France to entirely confirm my previous opinion that no engineering difficulty exists to prevent a line of sea-going steamers being built and worked forthwith to trade between Worcester and Paris and other continental ports, and that everything points to such a trade being profitable. The commodities carried at present from London to Paris are mainly pottery, horns, skins, iron, lead and leather; whilst the main export from Paris is sugar. If, however, a good trade from Worcester to Paris could be secured, back-carriage (at any rate for part of the return journey) would be found in flints from Shoreham, and china clay from Devon and Cornwall, which vessels returning from Paris would bring up to Worcester, where they could be stored in bulk at Diglis Rock, and forwarded on to the Staffordshire Potteries by canal in smaller quantities to suit the trade. At present large quantities of both of these commodities are used in the Potteries, but they are taken by sea to Runcorn on the Mersey, and there stored, and subsequently forwarded as required by Trent and Mersey Canal. Between Cardiff and Worcester the distance by water is about the same as by rail, namely, eighty miles, thirty-five of which are toll free. The Severn route, therefore, possesses enormous advantages in railway competition as compared with the Seine route between Rouen and Paris, so that if the latter can hold its own there is every reason to anticipate that a regular service of large barges, such as are now possible over the Severn route between Worcester and Cardiff, would command a considerable proportion of the heavy traffic now passing to and from the latter port and the Midland district." In conclusion, Mr. Marten says:—"I desire to state that although the information I obtained in France entirely confirmed the opinion I had previously held, that sea-going steamers of special construction might profitably navigate the Severn to Worcester, notwithstanding the existence of the Westgate Bridge, yet on the other hand it has strengthened the view which I have always expressed, that that bridge should be converted into an opening bridge at the earliest possible date. All that I saw and learnt proved beyond a doubt that the Westgate Bridge is a bar to any sea-going vessel, not of special construction, reaching Worcester."

THE Paisley Police Commissioners have instructed Mr. Moncur, the master of works, to prepare plans for the extension of the public baths in Storie Street.

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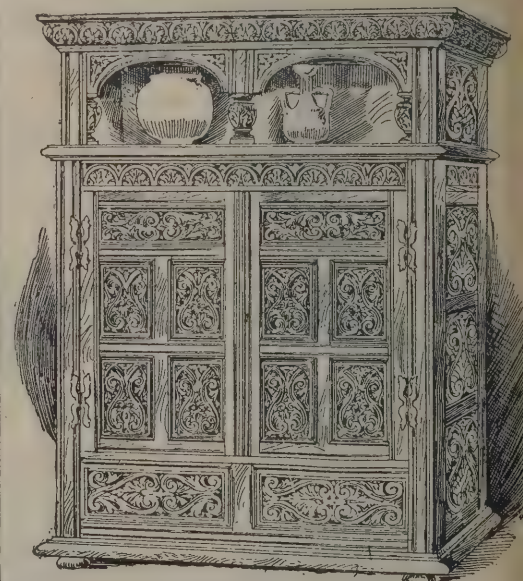
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LIGHT RAILWAYS.

A CIRCULAR letter has been issued by the Secretary of the Royal Agricultural Society of England to the members of that Society, referring to the fact that a conference on light railways has lately been held under the auspices of the Board of Trade, and a committee, on which the Society is represented, appointed to report upon the subject. It being desirable that the agricultural aspects of the question should be fully considered, the Council desire to receive any suggestions which the members may have to offer on the agricultural light railway requirements of any particular district in which they are interested, and a schedule of questions is given to which answers are desired. These questions are as follows:—“(1) Please state county or counties to which the subjoined observations apply; (2) district to be agriculturally developed, naming terminal towns, places or stations; (3) description of light railway considered most suitable; (4) the main line of railway, if any, with which a suggested light railway should have connections; (5) how funds for construction and equipment might possibly be provided—by local subscription, by rates or advances on the security of rates, or by a combination of these sources or otherwise; (6) any other observations likely to prove useful for the purposes of the inquiry.”

CONCRETE CONSTRUCTION—ITS PRACTICAL APPLICATION.*

THE practical application of concrete may be conveniently divided into four divisions, viz.:—(1) False work; (2) materials; (3) tools; (4) labour.

The second division can be usefully divided into four sections, viz.:—(a) Cement; (b) aggregates; (c) iron; (d) water.

DIVISION I.—False Work.—Concrete, in respect to false work, is unfortunate in comparison with other masonry, because it not only needs more expensive centreing whenever centreing is necessary, but it also usually requires cribbing, whereas other masonry does not.

This characteristic entirely prohibits its use in many cases where in all other respects it would be desirable, and it is therefore an obstacle to the more extended use of this valuable construction that should be minimised as much as possible.

* A paper by Mr. E. L. Ransome, read at the Convention of the American Institute of Architects.

Of late years I have met with considerable success by adopting systems of standard centreing and cribbing, which, while not of universal application, are of great use, permitting, as they have done, of the construction of floors and buildings that otherwise could not have been attained; but as this is of interest to the contractor rather than to the architect I will not enter into a detailed description thereof.

Great difficulties have often arisen from the swelling of the sheeting of the centreing or cribbing, caused by the wood absorbing the moisture of the newly-placed concrete. From this cause many arches have been lifted and broken, floors cracked and walls thrown out of line. By using sheeting-boards of a moderate width, say 6 to 8 inches, and bevelling one edge slightly, the boards may be put close together, and when expansion occurs the only effect will be to slightly crush the sharp outer edge of the bevel, without lifting or disturbing the concrete abutting or resting upon it, the widest side of such boards being of course placed facing the concrete.

This is such a very inexpensive, simple and unfailing remedy that from its conception I have used it in all cases, and since its use I have never had any trouble from swelling of the timber. Some such device as this is especially necessary in dry climates, also in light constructions, such as floors of but an inch or two in thickness, or hollow walls.

For standard centreing or cribs, if of wood, it is advisable to make them of planed lumber. The surface of the wood should be thoroughly coated with common thick kerosine oil before it is used for the first time, and before each subsequent use it should be brushed over afresh with the oil, or else with a paste made of castile soap and water. Fish oil is objectionable, as it is apt to injure the surface of the concrete, and linseed oil is generally too gummy for this purpose.

It may be accepted as a general rule that false work of light sheeting, well braced, is more economical than heavier planks with braces further apart. I am aware that this is not the usual practice.

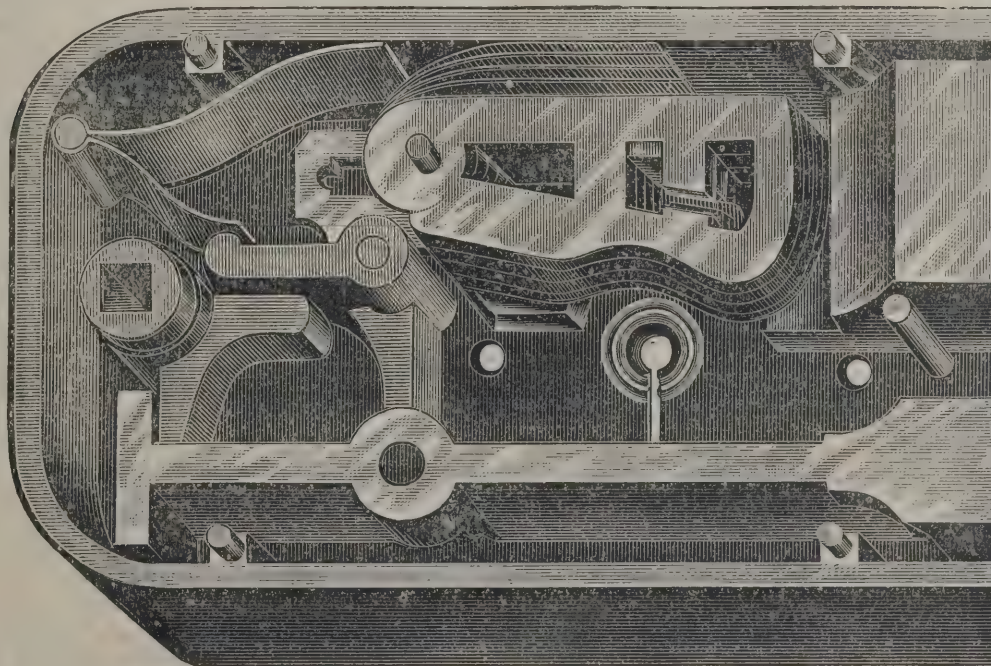
The ornamental effects can be much more cheaply produced by recessed than by projected work.

Materials.—Under this head cement, by reason of its greater cost and active qualities, stands out pre-eminent. I will limit my remarks under this subdivision to Portland cement, with the exception of the following observation, viz.:—

That where rapidity of construction is not a great object and aggregates are unusually cheap, by the use of common lime, with or without some of the cheap native cements, pro-

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perly handled, work of a good quality and of astonishing cheapness can be made—one part of lime to forty parts of aggregates not being considered too little in some cases.

Portland cement, a giant from its birth, is striding rapidly along in the way of improvement in quality and price, so that formulas of tests that were thought severe a few years ago would not be considered sufficiently exacting at the present time to insure as first class the cement that would successfully pass them.

The current technical literature teems with methods of testing, so that we can hardly go astray in the selection of a good cement. The three principal requisites for a first-class cement are as follows:—

1. That it sets or hardens without undue expansion or contraction.

2. That it be sufficiently finely ground.

3. That its tensile strength be high.

The usual methods of ascertaining these points are:—

1. The cake test. This test is so well known that a description of it here is necessary. When time is an object, by the use of hot water the test may be hastened. Under expert supervision the "boiling test" is by many considered superior to the cake test, but the difficulties in the way of carrying it out, and some uncertainties in the results that yet linger about this new test, prevent me from advocating its substitution for the older test.

2. The test for fineness. Ninety per cent. of the cement should pass through a hundred-mesh screen, having 10,000 holes to the inch. It would be better to use a yet finer screen for testing but for the difficulty of readily obtaining finer screens. The practice of using coarser screens is to be condemned because they pass much that is inert. The screenings should feel soft and silky to the touch. The residue on the screen should be hard, black angular grains. The economic importance of fine grinding has seldom been exaggerated. It is usually unduly disregarded, yet it has been established beyond reasonable doubt by repeated experiments that the sand-like grains of the cement are practically inert and useless. Still, unlike the first qualification, this is an economic question, and the ill effects of coarse grinding, if not apparent in the first test, can be overcome by making due allowance for the coarse portion in proportioning the cement to the aggregate, and then but little harm will follow the use of coarse ground cement in ordinary work.

3. Tensile strength. This test is usually and best made by

the aid of the ordinary testing machine. Several first-class cements will now develop tensile strengths of 600 or 700 lbs. per square inch in seven days, and while this may be too high a standard to insist upon, yet the cement that will not furnish a strength of 450 lbs. in seven days ought not, in my judgment, to be graded as first class, unless it is exceptionally fine ground.

With regard to the aggregates not so much has been published.

Sufficient interest is not usually taken in these inert materials, which nevertheless have a powerful influence upon the character of the concrete, so much so that a good aggregate with a poor cement will sometimes give better results than a good cement with a poor aggregate.

A first-class aggregate should be made of a hard, tough rock, free from clay or dirt, and having a rough surface and sharp angles when broken; it should be so graded from the finest grains to the largest pieces admissible in the work it is for, as to give, while retaining the largest proportion of large-sized pieces, the smallest proportion of voids.

If the aggregate is all of one material, the desired aggregation can be determined by weighing a given measure. That proportion which, while retaining the maximum amount of large pieces, weighs the most is the best.

If, on the other hand, the aggregate is composed of different materials, then that proportion which in a given measure and under the same limitations as just given will permit of the introduction into the filled measure of the least quantity of water is the best.

In making such tests the larger the measure the better; a round measure is better than a square box, and it should not contain less than 2 cubic feet. The material also ought to be shaken down into the measure. It is desirable, when time will permit, to make these tests with a mixture of one of cement to three of sand, but ordinarily with cements of equal fineness the relative strength of different brands will remain about the same as under the test with neat cement.

For fireproof work care should also be taken to avoid such aggregates as contain felspar, and where the possibility of the concrete being subjected to a long continued red heat is sufficiently probable as to be worthy of precautions being taken to meet its effects, limestone also should be rejected from the aggregate.

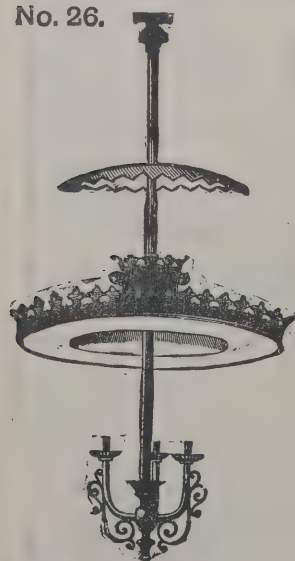
To those who have studied the matter practically it is evident that in the large majority of cases the prejudice against

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the use of the dust and finer particles created in crushing brick or stone is unfounded, and the practice of prohibiting these and substituting therefor ordinary sand is strongly to be condemned. Lieutenant Innes found that both limestone dust and ground, burnt clay gave stronger results than the purest sands, and tests and works carried out under my supervision thoroughly corroborate this.

The largest stone does not necessarily make the best aggregate. For instance, finely-crushed granite is for some purposes inferior to finely crushed limestone, although as a rule the granite is the harder of the two. One reason for this is not hard to seek. Owing to the brittle quality of granite, in crushing it is not only broken into small pieces, but many of these pieces are so bruised or contused that upon a little pressure being exerted upon them, such, for instance, as can be applied by the finger or thumb, they will crumble. With limestone and many other softer rocks, by reason of their greater toughness and elasticity, this is not the case.

Again, some stones, as quartz and the like, have surfaces of such smoothness that the adhesion of the cement thereto is not so good as that between cement and other stone, such as basaltic lava, sandstones and the like, which, when fractured, present a rough surface. Such stones as these latter usually make first-class aggregate. Broken stone, as a general thing, is a better aggregate than gravel. Sometimes a mixture of the two is preferable to either alone. Usually the use of one or the other has to be determined by the economic side of the question and the local supply. When from such causes gravel is selected, its quality can be greatly improved, at small cost, by running it through a crusher that will break the larger pieces as they pass.

The common practice of limiting the maximum size pieces so that they will pass through a 3-inch ring is, I think, open to question. In massive work, stones much larger may advantageously be used, not, however, if the late fashionable practice of "dry concrete" be adhered to.

The experiments carried out by Mr. Elliott C. Clarke tend to show that the presence of a small amount of clay in the concrete is no detriment to the strength of concrete, even with clay as much as 10 per cent. of the aggregates and cement combined.

In corroboration of this I would instance the Niagara gravel, which, whilst it contains a marked quantity of clay, yet makes most excellent concrete.

Having determined the aggregate, the next important

question is what is the proper proportion of cement to use for any given work?

With first-class materials, in round figures, and within the limits of proportions between the cement and the aggregates of from 1 to 4 to 1 to 15, the crushing strength of concrete when skilfully made, at a month old, may be taken as follows in tons per square foot:—Multiply the constant number 700 by the number representing the proportion of cement used, and divide it by the relative number representing the amount of aggregate used. For instance, a concrete composed of 1 part of cement to 14 parts of aggregates should, when properly

seasoned, have a crushing strength of $\frac{700 \times 1}{14} = 50$ tons. When three months old the strength will have increased some 25 per cent., and when twelve months old it will have increased some 50 per cent.

Under this rule a concrete composed of 1 of cement to 14 of aggregate would be about on a par with good brickwork when a month old, and be about 50 per cent. stronger when twelve months old. This rule reduces the strength of the concrete too much as the proportion of aggregate is increased, but it is reasonably correct and quite safe to act upon.

SECTION C.—*Iron*—The tensile strength of concrete is comparatively little, and by reason of the gradual though slight shrinkage that takes place in all concrete structures that age in dry situations, should not be relied upon in any important work.

For giving tensile strength to concrete, all modern workers of note now use iron in some form or other.

Angular iron bars, cold-twisted, commend themselves in many ways, and on this continent they have been more largely used than any other form in concrete iron construction.

The advantages of this cold twisting are many. They may be summed up as follows:—

1. The tensile strength of iron is largely increased, viz. from 20 to 50 per cent., dependent upon quality of iron used.
2. Its elongation under strain is considerably lessened, a very important advantage in concrete iron construction.
3. It forms a continuous key with the concrete, both longitudinally and also athwart the bar. The effect of the twist is to grip the concrete in every direction, and in fireproof flooring and other work where light construction is desired, the importance of this universal key is very great, for it counteracts the tendency which the bar otherwise would have to split the concrete along the line of tension.

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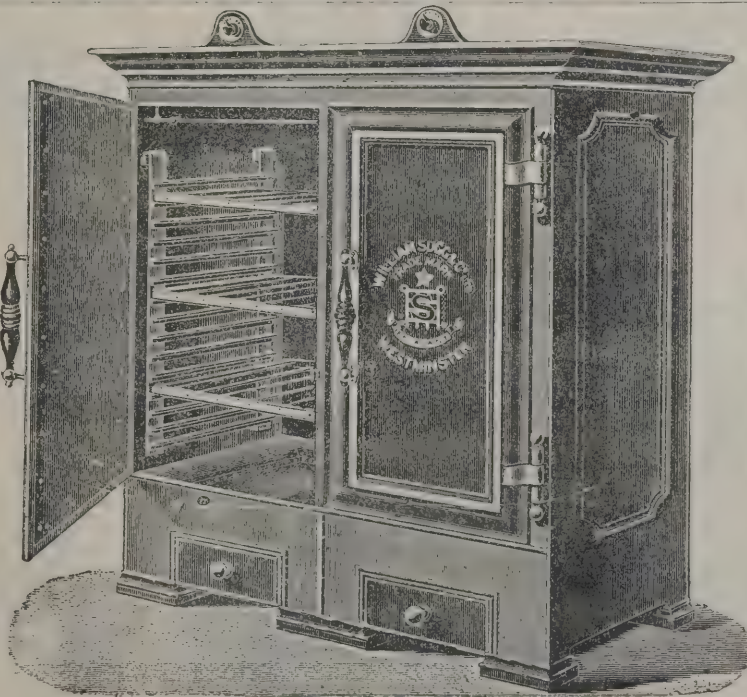
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4. The cost of twisting is nominal, and the royalty for its use not prohibitory.

In placing these bars care should be exercised in putting them in position where they will best exert their strength. They should be straight and laid directly in line of strain. Any deviation from this rule should be such that the tendency to straighten, which invariably occurs upon the application of the strain, will do little or no damage, such a deviation, for instance, as laying the bar of a floor beam with a slight sag in the centre. In such a case when the strain takes place the tendency to straighten would have the effect of thrusting the centre of the bar upward against the downward thrust of the load, and it would be harmless. If, on the other hand, the bar was laid crowning in the centre, upon the floor being loaded, the tendency of the bar to straighten would be in the same direction as that of the downward thrust of the floor load, and the consequences would be detrimental if not fatal to the integrity of the structure.

Concrete is an excellent conservator of iron. Von Emperger states that he knows of a case where iron rods were found perfectly rust free after having been embedded in concrete below the water level for forty years.

W. G. Triest, junior, states that a wrench that had been buried in concrete twenty-two years had kept its black metallic surface.

Referring to some concrete foundations that I built about ten years ago, the president of Starr & Co. writes as follows, under date of December 30, 1893:—"Though this foundation is on tide land and submerged in salt water more than half-way up, there is no rusting or deterioration to the iron. We had occasion to cut through one of the arches and found the iron as stated." A long time ago I embedded a dozen pieces of hoop iron in as many blocks of concrete, leaving one end of each piece of iron projecting from the surface. After years of exposure to sea air, all the exposed iron had rusted away, or so nearly as to leave but a few soft, jagged needles of rust that were readily removed by the hand. In all cases upon cutting into the blocks I found the iron almost as good as new, and from 1 to 2 inches from the surface it was invariably so.

SECTION D.—*Water*.—The water for mixing should be clear and by preference soft. If it cannot be obtained of ordinary purity then due allowance should be made for the impurities by an additional quantity of cement.

Sufficient water should be used to bring the mass when thoroughly mixed into a stiff, sticky, tenacious, viscous condi-

tion. An error as to the amount of water that should be used in concrete some years ago crept into the professional practice both of engineers and architects, and with surprising rapidity permeated and revolutionised it. I allude to the erroneous theory that only sufficient water should be used to slightly moisten the mass and hardly enough to render it cohesive in its uncompacted state.

An error seldom takes the hold this did upon a skilled body of men without some apparent justification. The only justification that I have been able to find after considerable research is the fact that, in making briquettes for testing purposes, the use of a minimum quantity of water gives the best results. From this one little isolated fact the generalisation was made that, to produce the best results, concrete should be mixed in like manner. The fatal flaw in this deduction lies here, viz. that a mixture of cement or of cement and sand, with water, differs radically in conditions when to either of these gravel is added, and differs yet more when broken stone is used.

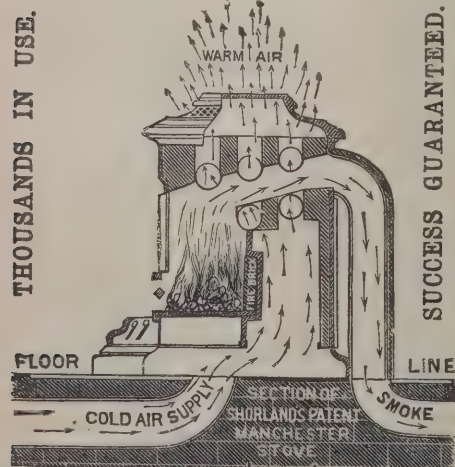
If cement, or cement and sand, is mixed with a large proportion of water, it cannot be compacted by blows or such pressure as can usually be brought to bear, for the mixture would flow from under the tamper. In the latter case, however, where gravel or broken stone are used, with a larger proportion of water, the concrete can be compacted more intimately and closely than with the minimum quantity, and under all ordinary conditions makes a much better concrete. The only exception to this is where smooth, rounded pebbles only are used with the mortar of the concrete, but this exception does not apply to ordinary gravel, and never applies where broken rock is an ingredient. I allude to this at some length, because the error, although on the wane, is still widespread.

DIVISION 3.—*Tools*.—There is great advantage and economy in mill mixing. Mills can now be obtained at a reasonable figure and should always be used on large works. By their use the cement is more fully utilised, the cost of labour lessened and the work is more uniform and satisfactory in character.

An objection is often made to mill-mixed concrete, viz. that the concrete is injured by overmixing. What is "overmixing?" A very rare distemper this. I have never once met with it, although I have been actively engaged in concrete construction for thirty-five years. It is never epidemic or fatal, but like vaccination, if present, it would prevent worse and more fatal ailments.

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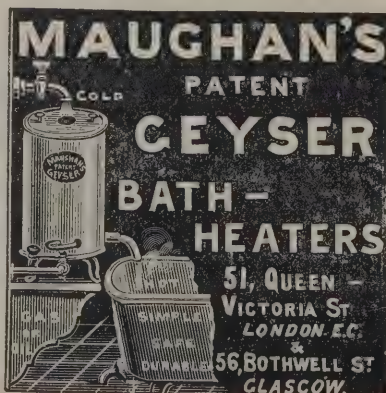
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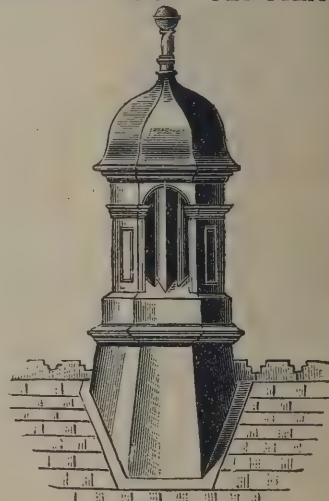
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Mr. Spencer Newberry found that a mixture of 1 of cement to 3 of sand, which when worked for one minute with a trowel developed a tensile strength of 87 lbs. in seven days, developed a strength of 240 lbs. in same period after being worked with the trowel for five minutes—a remarkable result surely, and well worthy of consideration.

Contrary to the almost universal opinion, Portland cement is improved by a delay between mixing and placing. I have experimented with several brands of Portland cement and find that they were invariably improved in tensile strength by a delay of from one to four hours between mixing and placing.

In placing concrete it is preferable to have it of one uniform consistency throughout the mass. In cases, however, where it is required that the face of the work should be of a finer grade, both grades should be carried on simultaneously, the face grade being placed up against the sheeting or mould a little in advance of the backing by means of a trowel or other convenient tool. In more careful work thin strips of iron about 6 inches wide and of any lengths convenient may be set up on edge in the concrete parallel to and at any desirable distance from the face of the mould. The face concrete should then be inserted between the mould face and the iron while the backing is placed at the other side thereof. As each layer is put in the iron is drawn up a few inches, so that when the concrete is tamped the effect of the tamping is conveyed below the lower edge of the iron, and causes the two grades of concrete to become thoroughly united and monolithic.

The material should in ordinary cases be placed in thin layers, seldom greatly exceeding in depth the length of the largest aggregates used, and these layers should follow one another sufficiently quickly so that one layer does not become stiff or partially set before the next is upon it.

Flat tampers should not be used for massive work except in the first and last layers of the day's work; thin or edge tampers should be employed. Wherever practicable the concrete should be compacted by rolling in preference to tamping. It is cheaper and much more effective. I am not aware of its being done outside of my own practice, but it is certainly deserving of almost universal use. On large work steam-rollers would be excellent.

It may be accepted as an axiom that concrete cannot be too thoroughly compacted, provided the action is not violent enough to bruise or crush the aggregate.

In massive or deep work, as it proceeds through the day, ten the working surface becomes richer in mortar. When, and

as often as this occurs, the mixture should be changed by adding thereto more of the larger aggregates free from fine dust, sand or gravel, until this fault is remedied. If on the contrary at any time the surface becomes open for lack of mortar, it should be immediately remedied by putting into the mixture a lesser quantity of the larger aggregates and not substituting anything in their place.

In a similar way the amount of water used in the mixings should be regulated, changing to more or less as the working surface appears too stiff or too watery. It should be firm under the tamper or roller, and yet the mortar should be viscous and unctuous to the touch.

The quantity required to produce this condition varies greatly, dependent upon the character of the aggregates, whether but slightly or very porous, and upon the age and character of the cement and weather.

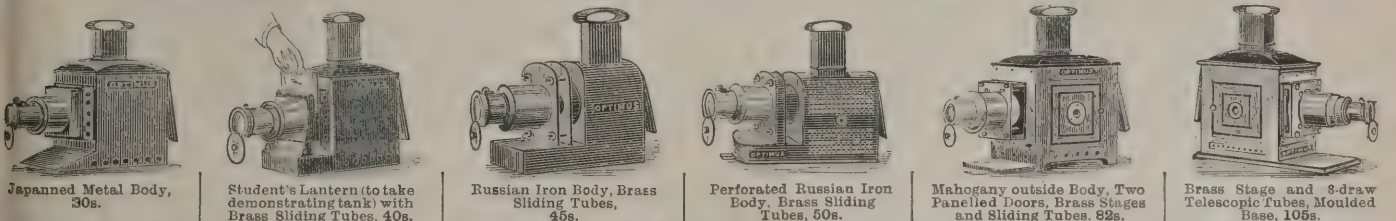
Great care should be observed in joining the work of one day to that of the next. The last layer should be thoroughly compacted and left with a slight excess of mortar. It should be finished with a level surface, which at proper time, as soon as sufficiently stiff, should be patted or stippled with a steel float so as to produce a surface studded thickly with little conical knobs. This surface should be kept wet throughout the night, and in the morning immediately before the application of the first layer of fresh concrete it should be covered with a wash consisting of a mixture of equal measures of Portland cement and air-slacked lime, mixed with water to the consistency of thick cream. This covering should be put on in excess and brushed thoroughly back and forth upon the surface so as to insure a close contact therewith, the excess being swept along just ahead of the fresh concrete until all the surface has been covered, when it should be removed.

When in place the concrete should be kept moist for as long a period of time as possible. When one bears in mind that the chemical action which causes the cement to harden can only take place in the presence of moisture, the importance of keeping the work wet is at once apparent.

In all concrete construction, excepting subway and other works where the concrete remains permanently moist, provision should be made for the slow but certain shrinkage that takes place in the concrete as it becomes thoroughly dehydrated. The vertical shrinkage will take care of itself, as the weight of the building is in harmony with its movement. The horizontal shrinkage, however, is resisted by the inertia of the structure and the friction of its foundation. There are several ways to direct

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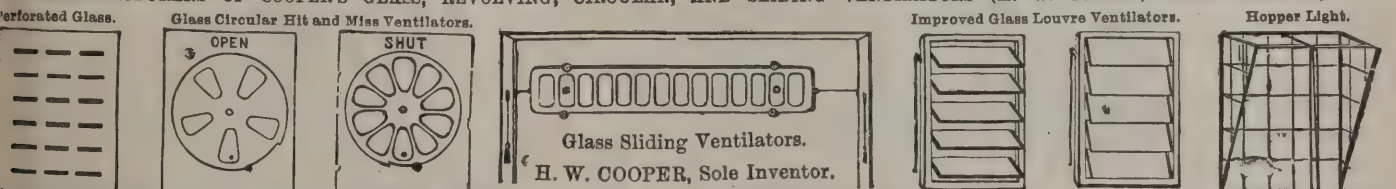
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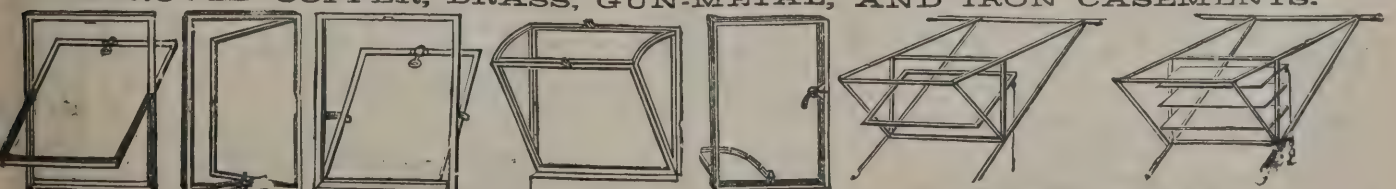
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such shrinkage. That which I have found most feasible is to partially divide the wall at certain intervals, preferably over the windows where there are several in line, and to insert across the division a weathering strip of copper or lead.

Where the appearance of a straight division line on the face of the building would be objectionable, for instance, a wall blocked off into ashlar face, I build this division straight and cause it to coincide with the line of the V recesses of the ashlar, marking in every other course, and I block out in the intermediate courses recesses opposite to the division line, and subsequently fill these recesses with concrete ashlars made and seasoned beforehand. By adopting the pattern of alternate long and short ashlars in every other course with long ashlars only in the immediate course, meeting at the centre line of the short ashlars above and below them, these separate concrete ashlars may be made small, and the additional cost of their manufacture will be but trifling.

Apart from the question of appearance, some such division of the surface of a concrete wall is advisable for a twofold reason: some defining line is needed at the juncture of each day's work at least, and by dividing up the surface by deep recesses into small sections, surface cracking is largely avoided.

In reference to this shrinkage of concrete, lest I should have unnecessarily alarmed you, I will state that in a building, the walls of which were 170 feet long and divided thus, it was nearly two years before any apparent shrinkage took place, and now it can hardly be observed by a minute examination of the division joints. No outsider, even though a careful observer, would be likely to perceive any effects of this slight shrinkage when thus controlled.

In situations where it is not possible to make shrinkage joints by a liberal use of twisted iron, shrinkage cracks can often be prevented.

The Resistance of Portland Cement Concrete to the Destroying Action of Fire.

By a misunderstanding, due to a windy interference (Mr. Stone tells me one of my letters was blown out of his office window), I find I am expected to speak on the protection concrete affords iron in case of fire.

There seems to be not so much data on this subject as one would desire. What little there is, however, seems to be in favour of concrete as a fire-resistant.

It is generally understood that the artificial stone made

with Portland cement concrete withstood the Chicago fire well. Some years ago the blacksmith's shop at the Bencia Arsenal, California, was burned out, leaving the outer walls standing. This was a brick building with granite door-sills, free stone belt courses, with window caps and cornice of Portland cement concrete. I examined the ruins carefully. The granite was spoiled badly and broken into several pieces; the freestone was badly broken and injured; the brickwork was burnt out in the joints in many places, rendering the walls unsuitable, many of the bricks also being spoiled, whilst the concrete window heads, which had probably to bear the brunt of the fire on the outside, were but little injured; the surfaces had softened a little and were badly discoloured, but they remained whole and strong.

Concrete bricks made of well-burnt clinker and lime by a process which converts the lime into a silicate of lime, thereby making it resemble a Portland cement in character, withstand the action of a hot fire and the subsequent sudden cooling by water better than any burnt brick, either common pressed or fire-brick, that I could obtain in San Francisco, and I presume the same relative result would be obtained from most of the bricks of the several States.

I have repeatedly made the tests so severe that every burnt brick in the dozen or so tested at a time broke into two or more pieces, whilst under the same test the concrete bricks, beyond discolouring slightly, showed no change.

The Thermic Expansion of Portland Cement.

Bonnican Bonnicean is quoted as giving the expansion of Portland cement at 0.0000143 for 1 Celsius, and iron is given at 0.0000145, which is practically the same.

Hyatt corroborates this in some careful experiments he made with loaded floors submitted to fire, in which the concrete iron construction bore a red heat for several hours without injury.

Throughout Europe I believe hollow tile construction is almost unknown. Concrete floors are commonly used in fire-proof buildings. The result of tests undertaken in Germany under Government supervision to ascertain the relative value of the ordinary building material, including brickwork, places concrete at the head of the list as the best fire resistant.

If due regard is paid to the aggregate used, so that felspar is avoided and limestone also, where the structure is liable to prolonged hot fire, I think it will be found that Portland cement concrete is an excellent fire resistant.

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PORTISHEAD LOCAL BOARD.

At a special and final sitting of the Portishead Local Board, held on December 11, the Clerk intimated that the formal sanction of the Board of Trade to the construction of the outfall of the proposed sewer on the Crown foreshore lands had been received.

The Surveyor was instructed to complete the contract drawings, specifications, &c., and advertise for tenders for carrying out the proposed sewerage works.

A vote of thanks was passed to the Chairman for his past conduct in the chair. The Chairman returned thanks, and hoped the new district council would work as happily as the Board had done.

The Chairman and members of the Board approved a testimonial acknowledging "the thorough and efficient services of the surveyor, Mr. T. J. Moss Flower, since his appointment to the office of surveyor and inspector on the formation of the Board," and bearing testimony "to the ability which Mr. Moss Flower has shown in forming and promoting the sewerage scheme for the urban district of Portishead, which has been approved by the Local Government Board, as well as to the skill and judgment shown by him in the general conduct of his duties." The testimonial was sealed and signed by all the members present.

KITCHEN BOILERS.

At the weekly meeting of the Glasgow Plumbing Class Mr. R. D. Munro delivered a lecture on kitchen boilers and their connections, with particulars of a series of bursting experiments illustrated by limelight views. Mr. John Gordon, architect, presided. The lecturer at the outset stated that he thought, in view of the greatly extended use of so-called hot-water boilers in public buildings and dwelling-houses, it was important that the students who would be the heating engineers of the next generation should have a sound training on such subjects as steam, heat and combustion. The kitchen and heating boiler was thought by many to be as innocent in the matter of heating water as the homely goblet, but the dreadful accidents which occurred in this and other cities in January last had aroused public attention to the fact that in the working of these boilers there were possibilities of great danger to life and property. The

lecturer explained at length the enormous force which could be stored up in the water contained even in the smallest boiler, and showed by diagrams how such force when suddenly relieved by rupture was certain to cause very serious damage. The water in the inlet and outlet pipes of kitchen boilers was liable to be frozen at exposed parts, and when this occurred the boiler would be hermetically sealed, and, like a tightly-corked flask containing liquid, would in these circumstances store up heat until the pressure so caused resisted the strength of its material. The boiler would then burst with great violence, and the larger the boiler and the more water it contained the greater would be the destruction. Diagrams of hot-water apparatus as fitted up in modern buildings were shown on the screen, and important advice was given with reference to the necessity for avoiding air-traps in the system and the best methods of arranging piping and connections. The lecturer thereafter went very fully into what is known as the "sudden generation of steam" theory, and showed by diagrams of the results of actual tests that it was impossible for a boiler to burst disastrously from this cause. The design and proportion of safety-valves best suited for preventing over-pressure, either through accumulation of heat in the water or by the sudden injection of water into a red-hot boiler were fully explained, and limelight views of the boilers treated in the bursting experiments were also shown. At the conclusion a vote of thanks was accorded to Mr. Munro, on the motion of Professor Jamieson, seconded by Mr. Fulton. The Chairman mentioned that the class was now in its seventh session, and the number of students enrolled (193) was the largest yet attained.

BUILDING IN THE WILLESDEN DISTRICT.

The annual report by Mr. Claude Robson, the engineer to the Willesden Local Board, contains the following respecting the new roads and buildings constructed in the year ended March 25, 1894:—The development of the district by building operations, as evidenced by plans submitted for the approval of the Board, has been greater during the year 1893-94 than in any year since the Board's formation in 1875. Plans have thus been presented for the laying out of nearly two miles of streets, for the erection of 919 houses, 53 buildings of various descriptions other than dwelling-houses and 105 additions or alterations to existing buildings.

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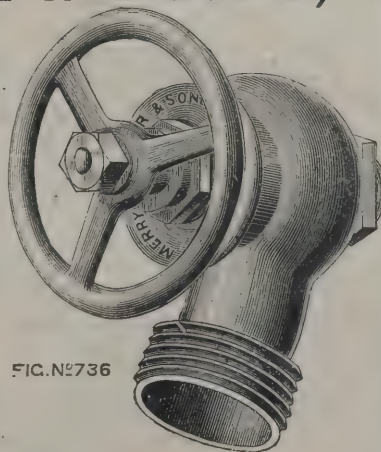
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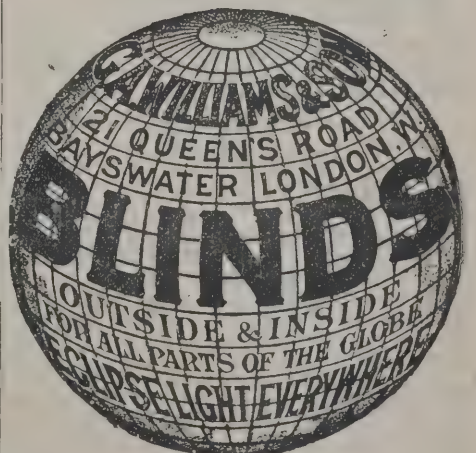
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GOLD MEDAL, Inventions Exhibition, 1885.

The applications relating to new roads principally referred to the metropolitan district; none were of a less width than 40 feet and in two cases they were laid out 50 feet wide. Sewers were provided in all instances and were laid in accordance with the rules and regulations of the Board relating to construction of sewers. The question of the desirability of increasing the width of many roads that are likely to become important thoroughfares was dealt with at some length in my last annual report, and I do not therefore propose to deal further with this matter, beyond recording the hope that the example set by the owners who have been induced to lay out roads 50 feet in width during the year 1893-94 will be generally followed in future years.

The number of houses provided for by the plans submitted for new roads was 691, which when occupied would represent a population of nearly 5,000 persons.

In all cases where the new estates abutted upon a public highway, the boundary line was set back at least 20 feet from the centre of the carriageway of the old road, in accordance with section 9 of the Willesden Local Board Act, 1887. In this way a long section of Church Road, adjoining the West Ella Estate, was widened to the extent of from 4 feet to 5 feet at a point where it was very desirable to increase its width. Harlesden Lane has been similarly widened for a short length and an improved and widened boundary arranged with the owners in Edgware Road, between the Windmill public-house and Slade Farm.

As in previous years the majority of the houses erected have been those of an estimated rental value of under 40%. These numbered 630, whilst those estimated at 40% and upwards have been 212 only. This, however, is a larger proportion than in the preceding year, when only 122 of the larger class were erected as compared to 607 of the smaller value.

The total number of buildings for which plans were submitted was 1,077, which may be divided into the following proportions, viz.:—

Dwellings over an estimated value of 40% per annum	...	...	...	...	19 $\frac{3}{4}$ per cent.
Do. under	do.	do.	do.	...	58 $\frac{1}{2}$ "
Shops	...	...	...	...	7 "
Buildings other than dwelling-houses	...	...	...	...	5 "
Alterations and additions to existing buildings	...	...	...	...	9 $\frac{1}{4}$ "

The number of applications represented by the buildings approved during the year 1893-94 has been 255. Of this

number seventeen only were definitely refused sanction owing to inability to comply with the by-laws. Eighty-nine were disapproved in the first instance, but upon a satisfactory amendment seventy-two were finally sanctioned. In twenty-two cases the localities of the proposed buildings were inspected by the outdoor committee, and report made thereon prior to consideration by the Board.

The estimated rateable value of the property represented by the plans submitted was about 26,000%, the actual increase upon the rate-books for the same period having been 18,000% only. This latter amount, however, included a few houses erected during 1892-93, but excludes many for which plans were submitted prior to March 25, 1894.

The contraventions of by-laws have numbered slightly less than in 1892-93, although a larger number of houses have been in course of erection. The specific by-laws most systematically contravened have been those relating to proper bonding of brickwork and composition of mortar, and the omission to give proper notice of completion prior to occupation of premises. It is these by-laws that have each year been most generally disregarded, and upon which I have commented in previous reports.

But little trouble has been experienced in enforcing the by-laws relating to drainage, and every care has been exercised in according careful supervision to same. The method of testing the drains hitherto adopted and as approved by the Board some years since, has been by the introduction of smoke rockets, but in some instances the water test has been applied. Objection has, however, been made by the majority of the builders to the application of this test owing to the "custom" hitherto adopted having been the smoke test. It is a point worthy of your consideration whether you should not issue instructions for the water test to be universal throughout the district. Any builder who intends carrying out a thorough and efficient system of drainage to his property would as willingly submit to the water as to the smoke test, whilst to bad work it is most desirable that as searching a test should be applied as is possible to be found.

In fourteen cases it has been found necessary to enforce compliance with the by-laws by legal action. In all cases convictions were obtained.

Owing to the large amount of building operations within the district, an additional inspector has been appointed under section 3 of the Willesden Local Board Act, 1887. There are now four inspectors in all, the Act fixing the maximum number

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at six. Should the amount of the fees admit of it, the desirability of still further increasing the building inspectors' staff is possibly a matter worthy of consideration.

Too much supervision to buildings cannot be accorded, and with a large district like Willesden it is but a limited amount of inspection that can be given to each building even with the reduced areas upon which the building inspectors now work. In the case of some estates, where a large number of buildings are in progress, sufficient work exists upon one estate alone to engage the attention of an inspector. This question may, however, possibly receive your consideration when the proposed reduction of fees is deliberated upon.

The income derived from building fees during the year 1893-94 has been 631*l.* 1*s.* 11*d.*, which is a fair average of the amount that may be anticipated as the annual income in the future. At no time since the first year when the maximum charge was made have the fees reached 800*l.* per annum, but during the first few years after obtaining the Act they closely approximated to that sum. This being more than was required for expenditure upon the salaries of the inspectors, they have been reduced on several occasions.

Thus a total of 55 per cent. has been taken from the charges originally inserted in the schedule attached to the Willesden Local Board Act, 1887, and which are now about 50 per cent. below those charged by the London County Council.

With the fees as at present, the estimated income may be taken at about 650*l.* per annum. This would be about sufficient to defray the expenditure required. The only justification therefore for still further reduction would be the accumulated amount derived from previous years' incomes which have exceeded the expenditure. But with the exhaustion of this fund any reduced fees would then possibly fail to supply sufficient to meet the demands, and an increase to the schedule of charges would become necessary. This, needless to say, would not be effected so easily as the various reductions recorded above.

Of the total amount of fees demanded (651*l.* 5*s.* 4*d.*), 130*l.* 13*s.* 8*d.* was outstanding at the end of the year 1893-94. This is a fairly moderate proportion, when it be remembered that the fees demanded during the last quarter of the year amounted approximately to the outstanding account at the expiration of the year. In thirty-three cases it was found necessary to issue summonses for the recovery of fees, being one less than the preceding year.

The average fee per house prior to the reduction in

January 1894 was 18*s.* 10*d.* By the reduction then made the average dropped to 15*s.* 5½*d.*, a very small amount for the work of supervision that has been accorded.

The obstruction of highways by building materials has necessitated the service of seven notices for the erection of proper hoardings for the protection of the public. In one case only was it found necessary to enforce the notice by legal action. During no year has so small a number of notices been served—a good sign that the builders are more disposed than formerly to carry out the requirements of the Board in this matter.

A large number of notices under section 75 of the Towns Improvement Clauses Act, 1875, has been served with respect to dangerous structures, more especially relating to insecure cornices and parapets in South Kilburn. This action was initiated by the lamentable accident which occurred on April 24, 1893, through the fall of parapets to the Sir Robert Peel public-house and houses adjoining, resulting in the death of two women and one child and injury to four other persons.

The evidence of dilapidation in these parapets was by no means clear so far as could be judged from an exterior inspection, as it was an extraordinary fact that the building inspector for that district had actually examined those very parapets from the roadway below one day previous to their collapse, and saw no sign whatever of their insecurity as was given in evidence before the coroner at the inquest. There is no doubt therefore to my mind that the faulty nature of the work, if at all visible, was to be found at the back of the parapet, and could only be seen by an inspection from the roof.

As many houses in the neighbourhood possessed parapets of a similar construction, it was deemed advisable that a systematic inspection should be made of all, not only from the roadway, but also from the roofs of the houses.

After a general inspection by myself, a detailed examination of certain premises was carried out by Mr. Worsley, one of the building inspectors, with great zeal and intelligence, the result being that many parapets and cornices, although apparently sound from an outside inspection, were found to be decayed and provided with no bond to the cross walls when examined from the roofs. Accordingly 236 notices were served upon owners of property to repair certain parapets, and I am glad to be able to record that although a large amount of correspondence and threatened litigation ensued, all were ultimately attended to.

The property to which the notices referred was erected in

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nearly every instance prior to the constitution of this Board, and the heavy composite cornices with which they were embellished were almost entirely of a uniform design enforced by the original freeholders. Thus no public supervision whatever had been accorded to the erection of the buildings, as the district was at that time under the control of the Hendon Union Authorities, who possessed no powers relating to the construction of new buildings.

In addition to the above, 242 cautionary letters were sent to owners of property possessing similar parapets to those that had fallen, but which were not in so dilapidated a condition as to warrant service of notices under the section of the Act before referred to. In most cases with regard to notices served, the heavy overhanging composite cornice was removed and replaced with a simple band or "necking," whilst additional improvement was generally effected to the houses of the neighbourhood by cleaning down and painting up the whole of the house fronts.

The cause of the accident was fully dealt with in a special report upon the subject, but it may here be briefly recorded that in my opinion the primary cause was the perishing of the mortar with which the parapets were built, and their separation from the party wall with which they should have been tied in or bonded. The ultimate and immediate cause of the collapse is of course difficult, if not impossible, to define.

Independently of the action taken by the Board with regard to dangerous cornices, fourteen notices were served in respect of ruinous buildings, all of which received attention by the necessary work being executed.

In concluding my remarks upon the section of this report relating to supervision of buildings, I would remark that the work generally has been most zealously carried out by the inspectors, whose difficult and oftentimes unpleasant task can only be appreciated by those who have had any experience thereof. Public opinion seems to infer in many instances that any faulty work that may be discovered in a building at any period after completion is due to imperfect supervision on the part of the public officials, and that each officer, notwithstanding the large area under his control, should in some unexplained manner be ubiquitous in person and enabled to supervise every section of work in every building each day carried out in an area of probably $1\frac{1}{2}$ to 2 square miles in extent.

District surveyors and building inspectors are but human, and it is an absolute impossibility for one inspector to be in thirty or forty places at one time, which would be necessary to

insure every item of work carried out being thoroughly supervised, with regard to nature of material used or method of work executed.

For absolute and perfect supervision, a clerk of the works should be placed upon each block of buildings, which would necessitate the appointment of fifty inspectors in lieu of the four now carrying out the work. As it is, I am confident they do their best, and with the cost involved for supervision of about 15s. 6d per house, I trust that both owner and occupier will acknowledge that they receive a service conscientiously performed and most moderately paid for.

PATENTS.

[This List of Patents is compiled specially for this Journal by Mr. G. H. Rayner, of the firm of Rayner & Co., Consulting Patent Agents, 37 Chancery Lane, London, W.C., from whom all particulars and information relating to Patents may be had gratuitously.]

APPLICATIONS FOR PATENTS.

23989. William Hamilton Aitchinson, for "Improvements in and connected with flushing apparatus or appliances for water-closets, drains, and for other purposes."

24030. Samuel Coleman Srawley, for "Improvements in sash-fasteners."

24304. John Donnelly, for "Improved appliance for strengthening the sliding sashes of windows."

24339. Frederick Thomas Myerson and Thomas Lane, for "Improvements in and connected with pots, cowls, or tops applicable for chimneys and ventilating shafts."

24382. Louis Janlet, for "Improvements in flushing tanks."

24383. Louis Janlet, for "Improvements in automatic flush tanks."

24407. Franklin Alfred Wells, for "Improvements in urinals."

24428. Albert Roberts Smith, for "Improvements in stoves and fireplaces."

24436. John Eastham, for "An improved sash-fastener."

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